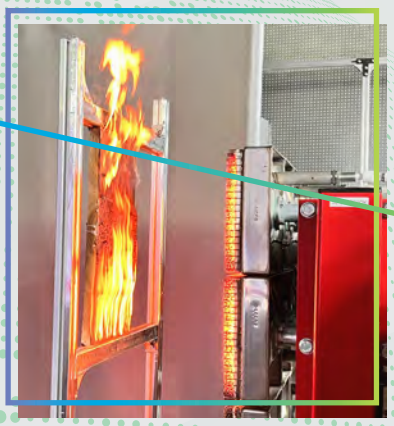
THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Faculty of
Construction and Environment
建設及環境學院

Research Excellence in Construction and Environment

Issue No. 7



Contents

DEAN'S MESSAGE

This booklet provides an overview of the research activities of the Faculty of Construction and Environment (FCE) of The Hong Kong Polytechnic University (PolyU) in 2021 and 2022, as well as the experts who lead these activities. FCE is composed of four academic departments - the Department of Building Environment and Energy Engineering (BEEE), the Department of Building and Real Estate (BRE), the Department of Civil and Environmental Engineering (CEE), and the Department of Land Surveying and Geo-Informatics (LSGI). As of mid-2022, the Faculty is home to about 100 academic staff at Assistant Professor and above levels whose expertise spans a wide range of areas in sustainable urban development and smart city, including construction, energy, environment, urban hazards mitigation and urban informatics. FCE hosts two Hong Kong Branches of Chinese National Engineering Research Centres (CNERCs) at PolyU, and the CAS GIG-PolyU Joint Laboratory of the Guangdong-Hong Kong-Macao Greater Bay Area for the Environment. The Faculty provides state-of-the-art facilities for about 400 research staff members and more than 500 research postgraduate students.

I hope that the information presented in this booklet would be useful to its readers in many different ways. For readers from the industry with a challenging problem in need of a solution, you may find the right experts in this booklet. For readers contemplating PhD studies, you may find an exciting research area and your ideal supervisors here. If you are a researcher looking for an opportunity for collaborative research, you may be able to find your future partner(s) from the booklet. And needless to say, you will find out more about the world-class research being undertaken at FCE in a wide range of research areas through this booklet.

The Faculty has the largest concentration of research expertise in Hong Kong in construction and environment-related disciplines as evidenced by its success in securing competitive funding from the General Research Fund of the Hong Kong Research Grants Council (RGC). In the Civil Engineering, Surveying, Building and Construction (CESBC) disciplines of the Engineering Panel, FCE won around 45% of the total grants awarded by RGC in both 2021/22 and 2022/23, with an average funding of around HK$0.9 million per project for each round. Our efforts in collaborative and multi-disciplinary research have also been fruitful. One exemplary achievement was a major research funding from the RGC Theme-based Research Scheme 2022/23 (Twelfth Round), with a total project amount of HK$44.5 million. Seven of our leading academics were awarded the RGC Collaborative Research Fund in 2021/22 and 2022/23, with a total research funding of more than HK$42 million, while two academics were awarded HK$5.7 million and HK$9.7 million funding from the RGC Research Impact Fund 2021/22 and 2022/23, respectively.

Our academic staff have actively engaged in research collaborations both nationally and internationally. Financial support from the National Natural Science Foundation of China (NSFC) included RMB¥15 million grant from the NSFC Major Research Plan for a three-year (2021-2023) integrated project, RMB¥2 million funding support from the National Excellent Young Scientists Fund (Hong Kong and Macau) 2022, and HK$1.24 million from the NSFC/RGC Joint Research Scheme 2022/23. 14 of our young researchers were also recognised by the NSFC Young Scientists Fund 2022 to further foster their research excellence. In addition, PolyU experts in the Faculty have been actively engaged in translational research, applying their research outcomes to challenging real-world problems. We have highlighted some of our ground-breaking research projects that have made an impact on the world around us in this booklet.

The Faculty is privileged to have seven Endowed Professors and two Endowed Young Scholars among our esteemed colleagues, that represents immense support and faith from the University and the wider community that our academics' research endeavours will advance the frontiers of knowledge and benefit both society and the world at large. It is FCE's ultimate aim that the research conducted by our colleagues should bring about innovations in sustainable urban development and smart city for the benefit of Hong Kong and beyond.

FCE has also achieved impressive world rankings. Quacquarelli Symonds (QS) World University Rankings by Subject 2022 ranked PolyU the 15th in the world and 1st in Hong Kong in the Civil and Structural Engineering discipline. For Architecture and Built Environment, we ranked 15th in the world and 2nd in Hong Kong. We also ranked 46th worldwide and 3rd locally for Environmental Sciences. In the 2022 "Updated science-wide author databases of standardised citation indicators" compiled by Stanford University, PolyU has the most top 2% scientists in the fields of Building and Construction (18 academics) and Civil Engineering (13 academics) globally. Among these top-notch scientists, 12 FCE academics were named top 50 scholars in the world in their respective fields.

To sustain the Faculty's first-class academic standing, the Faculty's strategic plan for the next three years includes refining our undergraduate and taught postgraduate programmes to develop new teaching and learning pedagogies, building up high-impact multi/inter-disciplinary research areas to promote collaborative and impactful research, offering high-quality research postgraduate programmes to nurture young research stars, scaling up knowledge transfer engagements to benefit our society, and strengthening international and national engagement.

By consolidating our strengths in the interlocking areas of construction, energy, environment, urban hazards mitigation and urban informatics, FCE is on the way to becoming a world leader in creating innovative solutions for sustainable urban development and smart city. We are confident that there will be numerous opportunities for FCE researchers as well as our collaborative partners in Hong Kong, the Greater Bay Area, the Nation, and beyond. I would like to thank the colleagues who have contributed to this booklet, and all those who have helped the Faculty in different capacities in our pursuit of research excellence.

Prof. Xiang-dong LI

Dean of the Faculty of Construction and Environment

March 2023

OVERVIEW of
the Faculty of Construction and Environment

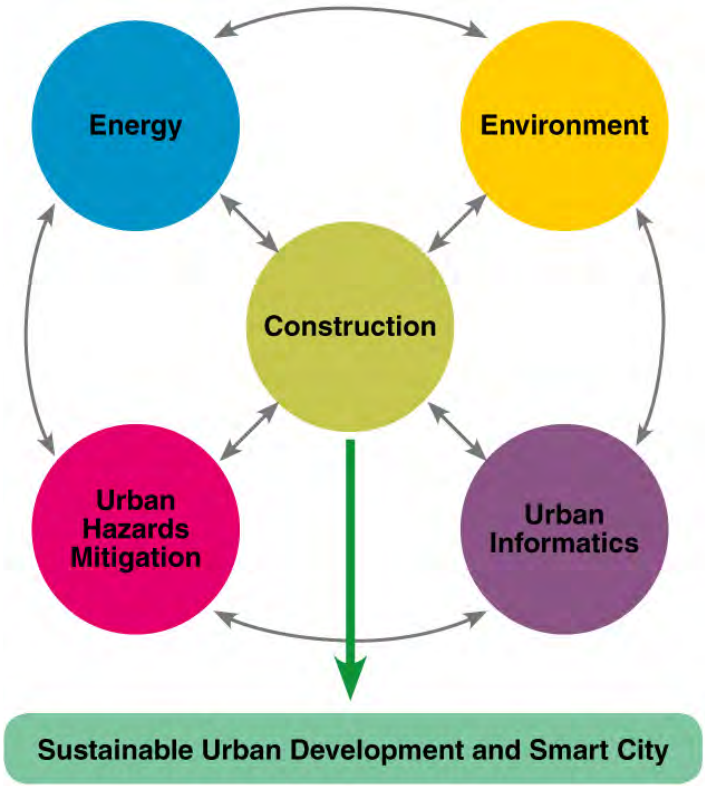
History

The Faculty of Construction and Environment (FCE) and its predecessors have created a lasting legacy of educating the professional workforce in the construction and environment-related fields for Hong Kong and beyond. From being little more than an idea before 1937 to the comprehensive unit embodied in the Faculty of today, the education, research and innovation of the Faculty are thriving into the second half of its eighth decade. With the largest concentration of research expertise in the construction and environment-related disciplines and the only local university with a Faculty relating specifically to the construction industry, The Hong Kong Polytechnic University (PolyU) has marked its 85th anniversary in 2022. A brief look at its history will show its remarkable growth to keep up with changing times.

In 1937, the first milestone in public technical education was established with the opening of the Government Trade School in Wanchai, PolyU's earliest predecessor. When the Pacific War broke out in 1941, chaos reigned throughout the city and the Trade School was closed. In 1947, the Trade School was damaged and devoid of equipment. To start over after the war ended, it was renamed the Hong Kong Technical College, which later moved to a new and larger site in Hung Hom in 1957. Focusing on Land Surveying and Building, it continued the tradition started by the Trade School of providing education in these disciplines.

The renaming of the Hong Kong Technical College and the subsequent birth of the Hong Kong Polytechnic in 1972 resulted in a corresponding development of education designed to meet the construction boom of the 1960s and 1970s in Hong Kong. In 1977, "Divisions" were created across the Polytechnic. The two which marked a milestone in the journey towards the Faculty we have today were the Division of Applied Science, which contained the Department of Building and Surveying, and the Division of Engineering which contained the Department of Civil and Structural Engineering. These Divisions remained in place for six years. With the range of expertise then available, the new Division of Construction and Land Use was composed of three Departments, namely, the Department of Building and Surveying, the Department of Building Services Engineering (BSE), the Department of Civil and Structural Engineering (CSE), and one Centre, the Centre of Land and Engineering Surveying. By 1992, two years before the inauguration of the Polytechnic as a University, this Division had grown to become the Faculty of Construction and Land Use. The structure of the Departments remained the same, with the Centre of Land and Engineering Surveying becoming the Department of Land Surveying and Geo-Informatics (LSGI) and the Department of Building and Surveying becoming the Department of Building and Real Estate (BRE) in 1993.

A time of major significance in the development of the PolyU came in 1994, when it officially gained university status. Since 1994, it has made tremendous progress with the growth in the number of research areas and the spread of a vibrant research culture. To better reflect its expertise, the Faculty was renamed the Faculty of Construction and Environment (FCE) in 2011, the Department of Civil and Structural Engineering was renamed the Department of Civil and Environmental Engineering (CEE) in 2012, the Department of Building Services Engineering was renamed the Department of Building Environment and Energy Engineering (BEEE) in 2021, BRE and LSGI remained the same. The academic programmes of FCE are well known for nurturing students for professional careers and leadership positions in a range of disciplines. Virtually all aspects of construction from land, building, quantity and general practice surveying to environmental engineering, building and civil engineering design, to actual construction and its management, to repair, refurbishment as well as the operation and management of built facilities are covered by the Faculty's programmes and its research activities. The endeavours of the Faculty's four departments have placed PolyU among the leading universities in the areas of construction, energy, environment, urban hazards mitigation and urban informatics in the world.



Research Direction of FCE

The Faculty of Construction and Environment (FCE) has a wide range of research expertise in the construction and environment-related fields and is uniquely positioned to develop innovative solutions for problems arising from urban development around the world. The rapid urban development process in different parts of the world as well as major infrastructure projects in Hong Kong present many challenges and opportunities for the Faculty. **Sustainable Urban Development** and **Smart City** have therefore been identified as the major research directions of the Faculty.

Sustainable Development means "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." ["Our Common Future", 1987]. Accomplishing sustainable urban development is one of the crucial challenges for Hong Kong as well as other large, vibrant cities around the world in the twenty-first century. Through research, innovation, entrepreneurship, consultancy service, and professional training provided by our faculty members, the Faculty is a place where research and innovation meet application to address major urban planning, development and resilience issues.

With the largest concentration of research expertise in the construction and environment-related fields in Hong Kong, FCE is at the forefront of leading and engaging in multi-disciplinary and cutting-edge research on Sustainable Urban Development and Smart City.

Interdisciplinary by nature, the focused research areas of our four departments: construction, energy, environment, urban hazards mitigation, and urban informatics, all contribute to Sustainable Urban Development and Smart City. By consolidating and enhancing our strengths in the interlocking areas, the Faculty is well-positioned to become a world leader in creating innovative solutions for **Sustainable Urban Development** and **Smart City**.

Department of Building Environment and Energy Engineering

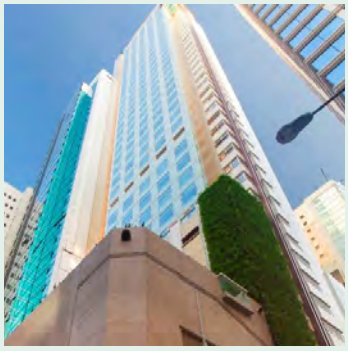
http://www.polyu.edu.hk/beee

The Department of Building Environment and Energy Engineering (BEEE) was officially established in December 1981 (formerly referred to as the Department of Building Services Engineering). We have been serving Hong Kong's building services engineering industry ever since, promoting sustainable, efficient and healthy indoor and urban living environments in one of the world's greatest cities by providing world class teaching and conducting internationally leading research. BEEE is one of the constituent departments of the Faculty of Construction and Environment, and offers a full range of taught and research based study programmes leading to awards from Bachelor of Engineering (BEng) to Masters (MSc and MEng) right up to Doctor of Philosophy (PhD).

Among many challenges confronting the world, perhaps the most critical is to provide high quality living environments to rapidly urbanising and ageing populations under the creeping threat of a worsening climate and increasing environmental pollution. UN forecasts that the world's population will reach 9.7 billion by 2050. 70% of the people are projected to live in urban areas, placing enormous strain on cities and the environment. To deal effectively with these challenges, future building engineers will need to be data savvy and work in interdisciplinary teams to deliver optimal solutions enabling smart urban environments incorporating elements such as vertical farms; renewables driven integrated buildings and transport systems; citywide recycling and so on for a sustainable planet and a smart and resilient built environment. In order to promote this vision, we have designed state of the art study programmes providing the best possible training to our students in designing high performance buildings and building systems through judicious exploitation of the sciences and contemporary technologies such as sensor and comms networks, AI and IoT techniques, data science and programming, BIM and digital twin systems etc. This is consistent with our mission, stated as, to imagine, engineer and promote sustainable, salutogenic and safe environments for human habitation.

Research Focus

01 Building Energy Efficiency



At the Holiday Inn Express Soho, optimization of its air-conditioning system design and control by the PolyU team resulted in savings in energy of over 25%

Energy issues in the building and built environments are addressed in the context of both demand and supply. Energy efficiency is enhanced on the demand side by the optimized design and smart control of energy systems, and on the supply side by the effective use of renewables as well as the innovative use of waste for clean energy generation. Research topics include robust and optimal design of building HVAC systems; optimal control of building HVAC systems; energy assessment/diagnosis of buildings with deficient high volume information (Big Data); demand management for smart grid; photovoltaic integration; hybrid solar-wind power generation; development of advanced renewable energy technologies; hybrid ground-coupled heat pump applications for air-conditioning in hot-climate region; highly dispersed nanocomposite for self-cleaning photovoltaic panels; green building nanomaterial and novel building envelope technology development; novel solar heat-reflective insulation material based on hollow glass micro-balloon cores with hierarchical porous rutile TiO2 coating; sustainable energy conversion and storage with emphasis on high temperature fuel cells for efficient energy conversion from biofuels or organic waste; planting techniques for enhancing CO2 absorption for urban rain gardens; technology development and economic feasibility of applying new urban biorefinery to convert solid wastes-derived lignocellulosic biomass into biofuels; low-carbon construction processes.

02 Building Environment

A thermal manikin

Research in this area has helped improve indoor and outdoor environments, such as improvement of pedestrian wind and thermal comfort in urban microenvironment, the use of HVAC systems to control indoor air temperature and humidity for thermal comfort and energy efficiency. Improving indoor environmental quality involves attention to thermal comfort, indoor air quality (IAQ), visual and acoustic comfort. For sustainable urban microenvironment, research needs to focus on developing integrated building design that considers ventilation, pollutant dispersion, building materials, urban planning, pedestrian wind and thermal comfort in high density cities. For the best possible indoor environment with the least energy consumption, research needs to focus on developing innovative technologies and improving existing technologies. These include precise control of indoor thermal parameters, novel ventilation strategy for improved IAQ at the lowest possible energy use, ventilation-enabling sound insulation technologies, novel duct noise control technique using periodic Helmholtz Resonators, multidimensional psychoacoustic assessment of acoustical environments, novel indoor silencing devices, the use of daylight for energy saving and visual comfort, studies of interunit pollutant dispersion in multi-storey buildings, use of innovative building envelopes to enhance indoor environmental quality, etc. Enhanced wind and thermal comfort in the urban microenvironment can be developed through computational modelling, new design tools and policy reviews.

03 Building Safety and Resilience

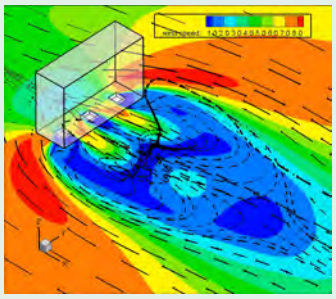
A 365 m tall Lightning Observation Tower at the BEEE Lightning Research Laboratory in Shenzhen

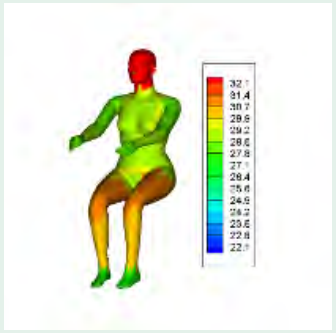
With intelligent management of tall buildings, traditional aspects of building safety such as structural strength and fire resistance must also include newer concerns, such as the interference of lightning bolts with electrical and electronic systems. In collaboration with the Shenzhen Meteorological Bureau, a 365m high tower was installed with sensors and measuring systems to provide a unique experimental platform for researching the atmospheric environment, such as enabling the interaction of lightning with modern facilities to be investigated on a real scale. As the actual lightning current is captured for testing, practical and effective techniques for protecting buildings, electric power systems and telecommunication/ signalling systems from lightning can be developed. The mechanisms and fire ignition process due to lightning currents are also investigated. Recently a joint laboratory has been established with the Shenzhen Power Supply Bureau. It is the first laboratory in China that integrates grid systems and building electrical systems, and serves as a platform to develop intelligent power equipment, and to address various safety issues in the utilization of electricity, such as electric shocks and electric arcs.

BEEE researchers also work with fire services and fire safety engineers, seeking innovative, performance-based and AI-based engineering solutions to practical problems. With the newly established Research Centre for Fire Safety Engineering, six faculty members are conducting research on various fire engineering topics, such as smouldering wildland fires, fire hazards at the wildland-urban interface, fires in tall building, travelling fire phenomena in large open plan compartments, fire hazards associated with batteries, fire safety in spacecrafts, and structural and material responses to fire. The latest focus of fire safety research is the first ever smart-firefighting system (SureFire) with leading international researchers, laboratories, a government agency (FSD), and multiple high-tech companies. This smart system will adopt the complex data-generating networks that enable real-time monitoring of the evolution of urban fire hazards. Implementation of such a system for smart firefighting will strongly support Hong Kong's claim as a leading smart city.

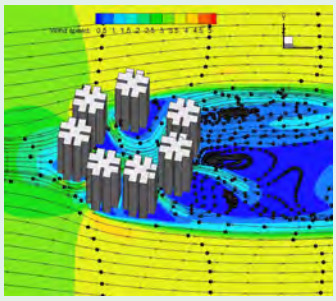
Impact
Case Studies

Design for Outdoor Thermal Comfort





Microclimate and human comfort modeling



Building layout optimization

The building environment group of the Department has conducted pioneering research in urban microclimate engineering by developing computation-based design methodologies. Leading the RGC Theme-Based Research Scheme project *Healthy and Resilient Cities with LoCHS*(*localized comfort-hubs*) and in collaboration with three other universities and overseas researchers, progresses are being made in the following key areas:

- Develop a suite of science-based physical and physiological models needed to simulate the impacts of landscape, and building layout design features on the ground level thermal and wind
- Develop a computational platform to automate the optimization of the architectural design and landscape plan options based on simulation analyses so that maximized comfort levels in targeted open and semi-open spaces can be created
- Provide prototype designs taking into account demographic factors, and identify potential reforms in professional practices, urban planning regulations and development control framework

The ultimate aim is to create "localised" outdoor and semi-outdoor microclimates that are distributed in each neighbourhood and proportional in scale, with maximized thermal comfort at the pedestrian level, by utilizing the combined wind and shading effects of solar- and wind-structure interactions. The numerical-simulation-based tool developed as the research outcome is to help building design professionals make better informed decisions of design options in the landscape and master planning stage.

An example of popular outdoor place

The first workshop with major government and industry stakeholders

Protecting Society from Fires with Fire Engineering Research

Thirty-five years of research on fire engineering have focused on fire spread and control for buildings, fire models, fire suppression systems, fire safety of different types of buildings and wildland fires. All of them have advanced knowledge, solved practical engineering problems and informed quality teaching. Research results have been applied to assist the HKSAR government to review fire safety provisions for big construction projects while implementing a fire engineering approach. In 2019, Prof. Asif. USMANI secured the first-ever smart-firefighting research project (SureFire, HK$33 million) with leading international researchers to help Hong Kong achieve the status of the world's leading smart city. Dr Xinyan HUANG has served local government departments concerned with fire safety, assessing construction projects with respect to a fire engineering approach and steering the development of fire safety codes. With the appointments of Prof. Mingchun LUO, Dr Liming JIANG and Dr Jihao SHI, BEEE's fire division now has five faculty members, facilitating the establishment of a new Research Centre for Safety Engineering, and expanding its fire research and education capacities.

Vision-based Solutions for Lighting, Imaging, and Metaverse Systems

With the development of technologies, especially in the coming age of the metaverse, human beings are living in a combination of physical and digital environments, which contains various new viewing conditions that did not exist in the past. For example, the LED lighting products produce illumination with narrow-band spectral compositions, and augmented reality (AR) technologies superimpose virtual objects on the real environments. Various scientific studies have been carried out to understand how the human visual system responds to these new viewing conditions through different underlying mechanisms. During the past five years, various research funds from the Hong Kong Research Grant Council (e.g., Research Impact Fund, General Research Fund), the National Science Foundation of China (e.g., Excellent Young Scientists Fund, General Fund) were secured to support the fundamental research. The research findings have led to the development of various solutions for advanced lighting, imaging, and metaverse-enabled systems through collaboration with world-leading high-tech companies (e.g., Facebook, Google, Huawei, XiaoMi, etc), with most of the solutions having been implemented on real products.

Smart Building Energy and Carbon-Neutrality Technologies

As major consumers of electricity (over 90% in Hong Kong), buildings need to play a major role in response to the pressing challenges for reaching the goal of carbon-neutrality by 2050. Various innovative technologies have been developed by adopting a multidisciplinary approach integrating information and IoT technologies, big-data analytics, machine learning (AI), uncertainty analysis, etc., with building and energy system domain knowledge. The technologies include: (1) optimal design, control, diagnosis, and commissioning of building energy systems; (2) optimal design and optimized integration of multiple generations and energy storage systems; (3) advanced building energy flexibility technologies for facilitating the high renewable penetration in power grid; (4) PV materials, PV integration in buildings, wind power, ground-coupled heat pump and indirect evaporative cooling.

Several major research grants have been successfully secured, such as: (1) RGC-CRF: Development of next generation key technologies for smart buildings; (2) MOST of China: Development of smart energy management technologies for complex building energy systems in high-density cities (SEM4City); (3) RGC-CRF: Effective ventilation strategies for mitigating infection risks in hospitals.

The research outputs have made significant impacts on industrial applications. A smart, energy efficient and flexible building adopting the above technologies is under development in cooperation with SHK on top of the West Kowloon high-speed rail station.

Department of Building and Real Estate

http://www.polyu.edu.hk/bre

Nurturing students for the construction and real estate industries since 1937, the Department of Building and Real Estate (BRE) has a distinctive history and is internationally recognized for its academic and research excellence. BRE has a multi-disciplinary team of academic staff who possess expertise in the respective fields of surveying, engineering, architecture, construction health and safety, town planning, building technology, real estate, finance, law and economics, etc. The undergraduate and postgraduate programmes (inclusive of a Doctorate degree) of BRE nurture more than 500 graduates each year. With their knowledge and skills, BRE alumni have contributed to the prosperity of the region and beyond. Addressing complex challenges with tailored-made solutions, BRE is committed to impactful research projects and consultancies, with focuses on 'Construction Health and Safety', 'Sustainable Urban Systems' and 'Smart Construction'. Tapping into the opportunities ahead, in particular the Greater Bay Area, BRE shall assume a proactive role to transcend frontiers and advance knowledge in pursuit of a sustainable built environment.

Research Focus

01 Construction Health and Safety

The research team performed treadmill running tests on the Anti-heat Stress Uniform inside a climatic chamber

Construction is a large, dynamic, and complex sector, creating employment for millions of people worldwide. Unfortunately, it is also a sector with the most fatalities and high incidence of occupational injuries. Workers in the construction industry are subject to potential health risks and exposures throughout the building process. Construction workers suffer both acute and chronic illnesses from exposure to environmental hazards, including chemical and physical hazards that can potentially lead to numerous diseases, cancers, and/or disorders. Chemical hazards come in all forms and enter the body by inhalation, ingestion, and absorption. Excessive noise damages the hair cells of the inner ear; UV light affects the skin and eyes; heat stress affects body thermoregulation and causes heat-related illness. The mission of this research group is to assess the level of environmental and physical hazard exposures in the construction industry, and investigate the impacts of different types of chemical and physical hazards on the occupational health of construction workers. It will provide useful information for occupational health and safety policies and measures, applying controls when and where appropriate, as well as informing construction workers about adverse health behaviors.

02 Smart Construction

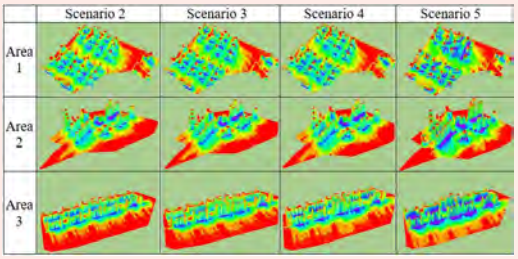
Smart construction aims to reduce or replace human involvement in the construction process. Construction industry typically employs two types of people: managers and doers. In our opinion, it is relatively easier and more cost-effective to reduce/replace construction managers. In recent years, we have experimented the use of surveillance cameras and artificial intelligence (AI) to replace the eyes and brains of managers. This has generated some degree of success (see Figure 1). In order to tackle situations where surveillance cameras are not allowed or not possible, we are studying the deployment of Internet of Things (IoT) to track tools and equipment used by workers. Based on the tracked data and inverse dynamics, we shall be able to indirectly measure the activities, progress, safety, and other issues pertaining to construction site management (see Figure 2). We aim to lead the technological advancement through providing well-researched and feasible technologies to transform the construction industry from its conventional status-quo to a smart industry. In order to relieve construction workers from heavy workload, we are developing exoskeletons and artificial muscle systems. We are also studying various robotic technologies to do hardships for human-beings.

Figure 1. Automated site management based on Computer Vision and AI

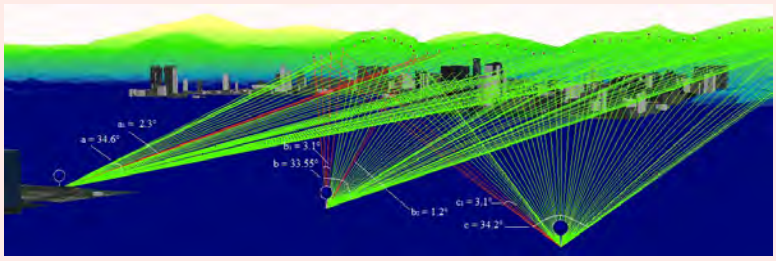
Figure 2. IoT enabled site management

03 Sustainable Urban Systems

This area focuses on sustainable urban development in high-density cities such as Hong Kong and conducts scientific inter-disciplinary studies on a range of scales, from city to districts and buildings, drawing expertise from relevant professionals in the construction such as town planners, surveyors and engineers. One example of our recent studies is a 3D spatial analysis of different scenarios with respect to plot ratios and building heights (PR/BH) in the Kai Tak development area, to assess their impact on the urban skyline, mountain ridgeline, sunlight and shadow, wind ventilation and air temperate.



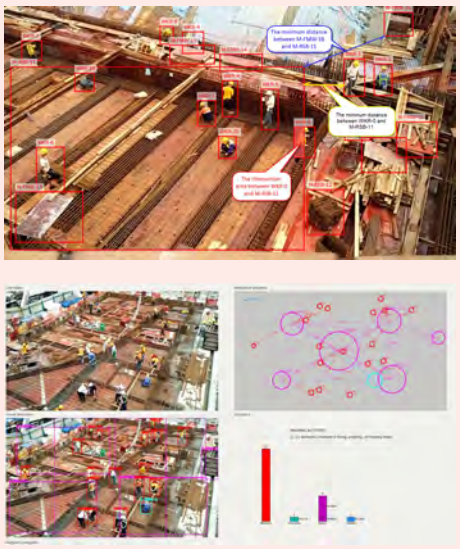
Comparison of the average sunlight hours per day in winter among different scenarios



Extent of blockage of the Lion Rock mountain ridgeline by the proposed building development

Impact
Case Studies

A Vision-based Approach to Project Intelligence for Construction Site Monitoring Automation



The Project Intelligence system is designed with several practical expectations, i.e., using site images, detecting and analyzing multiple synchronous construction activities, and being fully automatic. Therefore, it is possible to save people's valuable time in data collection and manipulation for onsite monitoring and concentrate their attention on solving problems that necessarily demand their expertise.

More specifically, this system can nourish several potential applications. First, the system can be used to index and classify daily site images, which are usually taken for various management purposes, e.g., quality control, safety management, and progress record, but without textual description. Automated indexing and classifying these images should be helpful. Second, since surveillance videos can be decomposed into time-lapse images, the method can be used to continuously monitor the construction resources involved in specific activities regarding working hours. Third, given site videos, it is possible to detect the states of an activity (i.e. not started, just started, ongoing, and completed). Therefore, we can establish the activity progress deviation against construction programs in real time.

Study the Effective Transitional Housing Delivery in Hong Kong

This research project has a significant public policy impact recognized by Policy Innovation and Co-ordination Office (PICO). With analysis of commonalities and differences between overseas and local experience, we shall consolidate lessons for Hong Kong and then propose (i) Policy recommendations (including adjustment to development control regulations and approval process) to the HKSAR Government, and (ii) Best Practice Guide for potential project proponents and operators. These deliverables aim at enhancing the efficiency and cost-effectiveness of project implementation, optimizing project sustainability and maximizing benefits to tenants. Transitional housing depicts a social innovation which fosters a paradigm shift of housing development in Hong Kong by: (i) breaking the dichotomy of public and private housing, (ii) providing not only physical accommodation but also delivering social support to tenants, (iii) requiring Non-Government Organisations (NGOs) to take up multiple roles as builder, operator and service provider while government performs as facilitator, and (iv) integrating trans-sectoral and trans-professional collaboration at the outset of the whole process of project conceptualization, implementation and operation. The crux of success under this new paradigm is mutual understanding and trust, efficient communication and effective collaboration.

Aiming to forge a solid partnership of all related sectors and professions including NGOs, government, angel landlords, related development professionals and contractors, the study will focus on examining their interplay, contribution, pain points, conflicts and issues. This will be carried out against various transitional housing forms through remodeling existing flats, converting schools and other government buildings, and constructing new relocatable blocks in public or private land of short tenure, etc. Measures to facilitate wider and cost-effective application of Modular Integrated Construction (MiC) approach will be a special focus. A Development Manual written in an easily comprehensible manner will be published to cover technical issues in all stages of the development and operation process with a matrix for all involved parties to set out systematically their role, issues to be tackled, input and resources required, guidelines and standards, etc. It aims to enable expeditious delivery of transitional housing of decent quality.

Development of Measures to Foster Collaboration Among Construction Professionals in Hong Kong and Qianhai

Qianhai was designated by the Chinese Central Government in 2010 as a Qianhai-Hong Kong Modern Service Industry Cooperative Zone. It has become one of the highlights in the Greater Bay Area's development as it provides ample opportunities for individuals and businesses from both Hong Kong and the Mainland to grow and expand. In terms of the construction sector, Qianhai also plays a pivotal role in accelerating exchanges and integration between Shenzhen and Hong Kong. A team led by Building and Real Estate (BRE) Professor worked on Shenzhen-Hong Kong cooperation in the construction sector and innovation on institutions and mechanisms. Based on the experience of the pilot project to trial the Hong Kong construction model in the Qianhai Cooperation Zone, the team has also actively participated in drafting two sets of record-filing measures, namely, "Administrative Measures for the Registration of Hong Kong Construction Organisations in the Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone" and "Administrative Measures for the Registration of Hong Kong Construction Professionals in the Qianhai Shenzhen-Hong Kong Modern Service Industry Cooperation Zone". These two measures have been enforced by the Authority on 1st October 2020. Until now, over 50 Hong Kong-based professionals and 6 Hong Kong-based organisations have completed their filings in the Qianhai Cooperation Zone, and many other filings are still in progress. The implementation of the two measures will help break down the qualification barriers in the construction sector of Shenzhen and Hong Kong, expand the scope of implementation of the Hong Kong mode of construction, accelerate exchanges and integration between the construction sectors of the two cities, and attract more Hong Kong professionals to participate in the development of Qianhai. Contribution of BRE team in promoting the collaboration of the construction sector between Shenzhen and Hong Kong has been highly recognised by the Qianhai Authority. The team will, based on the abovementioned measures, continue their study on the applicability of the Hong Kong construction model, including approval and supervision mechanisms, consultancy service charging standards, and employees' compensation insurance. In this way, the team aims to enhance the degree of cooperation between Hong Kong and Shenzhen in the construction sector to the next level.

Leak Detection and Pinpointing its Location in the Water Distribution Network

Hong Kong (HK) has 8,605 km of potable and saltwater pipes with an average age of >30 years, which are approaching the end of their service life with high cost of maintenance. As a result, a considerable number of pipe bursts/breaks (148) and detected leakage (9,585) cases were reported in 2016. Mainland China (MC) has 756,623 km of water pipes with a leakage rate of 14.32% in 2016. The number of reported breaks in Beijing (1987-2005) was 9068 with a rate of 0.073 breaks/km/year. These statistics show the critical situation of water distribution network (WDN) in HK and MC. The socioeconomic consequences of water pipe breaks/bursts are high and can cause considerable damage to society, businesses, and the environment. They usually bring severe consequences, not only due to waste of water, but also flooding, damage to road surfaces and other adjacent infrastructure, and threats to life, public health and environment.

In Hong Kong, it is reported that non-revenue water was 33% in 2015 with 17% attributed to leaks and 16% to bad private connections, illegal activities, and meter inaccuracies. Leaks from water pipes should be proactively repaired to be safer for society and the environment. The BRE research in this domain is a key step in improving the HKWDN and contributing to a better understanding of pipe performance. As a result, HKWDN could be efficiently preserved and cost-effectively maintained.

Department of Civil and Environmental Engineering

http://www.polyu.edu.hk/cee

As a leading department in civil and environmental engineering, we take great pride in our research excellence, the quality of our education programmes, as well as the synergy of our renowned scholars and professional faculty members in the field. We offer not only a broad-based, high-quality, interdisciplinary education in the areas of structural, geotechnical, hydraulic, transportation and environmental engineering, but also advanced practical training to enable our students to function as competent engineers in an ever-changing world.

In the 2022 QS ranking for the discipline of Civil and Structural Engineering, PolyU is ranked 15th globally and 1st in Hong Kong. Riding on the international recognition from the rankings, we have performed exceptionally well in securing external research grants, including three Theme Based Research projects in 2017/18, 2018/19 and 2022/23, four Research Impact Fund projects in 2018/19, and one Collaborative Research Fund in 2021/22, with a total funding of HK$160.9 million.

Research Focus

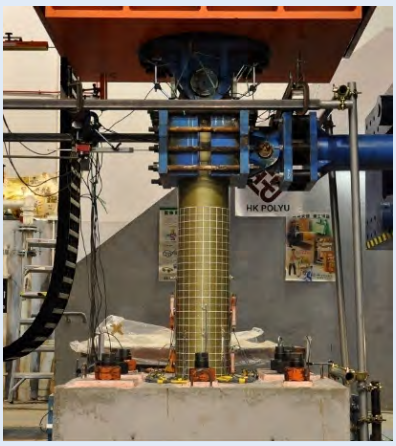
01 Smart Materials and Sustainable Structures

Research on Composite Structures

The use of corrosion-resistant fiber-reinforced polymer (FRP) composites in the strengthening of existing structures and the construction of new structures offers an effective solution for enhancing the performance, including the service life and hence the sustainability, of structures. The research on FRP composites in construction from the research team of PolyU has been widely accepted as a source of reliable models/ methods and has thus been adopted in major national design codes/ guidelines (China, US, UK, Australia and Germany) for use in structural design around the world. In particular, many of their research findings have been adopted by the second edition of the Chinese national standard "Technical Standard for FRP Composites in Construction" (GB 50608 2020). The research team also pioneered the research area of FRP-steel-concrete structures with a view to achieving high-performance structures through the optimal combination of these three materials. The new hybrid FRP-concrete-steel double skin tubular members (DSTMs) invented by the team have led to follow-up studies at many universities around the world and have recently achieved the first practical implementation in a real bridge in the Chinese mainland.

Research on Structural Health Monitoring and Vibration Control

Urbanization to meet economic development worldwide has resulted in mega building and civil structures such as super-tall buildings and long-span bridges. The Hong Kong Polytechnic University (PolyU) research team has conducted pioneering research to develop emerging monitoring and control technology to ensure functional, safe, sustainable, and resilient structures. The developed technology has been applied to a number of landmark structures, including the Hong Kong-Zhuhai-Macao Bridge, the Tsing Ma Bridge, the Stonecutters Bridge, the Canton Tower and Shanghai Tower. The mission of the research is to develop new technologies and methodologies for assessing, monitoring, and controlling of urban infrastructures to ensure infrastructures function properly at all levels of specified performance and to prevent them from sudden failure and natural hazards in a life-cycle context. The work has led to improved structural design methods, reliable structural performance assessments, and scientifically based structural inspection, monitoring, control, and maintenance programmes.

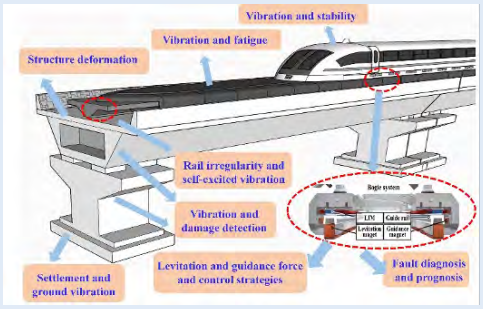



FRP-concrete-steel double-skin tubular members (DSTMs)

02 Sustainable Transport and Infrastructure

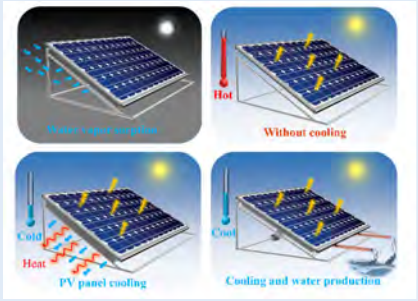
Reliable, efficient, safe and environmental-friendly transport infrastructure is essential to providing sustainable transport systems, especially in densely populated cities. The research in sustainable transport and infrastructure has focused on three main areas to help meet this demand. These research activities range from the construction of transport infrastructure to consideration of its operation, maintenance and management systems. They include the development of sustainable construction materials, efficient operation of intelligent transportation systems and innovative monitoring technology for railway safety and system maintenance.

The first involves road and walkway pavement materials such as eco-blocks and recycled bitumen. The research team's work on these new materials has facilitated their widespread use in Hong Kong. The second area is developing efficient algorithms for the implementation of intelligent transportation systems (ITS) to provide real-time traffic information on major roads. The research has reduced the number of detectors needed to manage such systems in Hong Kong and Bangkok and so decreased their costs substantially. Finally, innovative technologies have been developed to monitor railway systems, including high-speed rail and maglev lines, to optimize maintenance and management in Hong Kong as well as Brazil, China and Singapore.



Monitoring of high-speed and maglev trains in Mainland China

03 Sustainable Urban Environment



A new PV system which captures water from air to help PV panel to cool down. It can significantly increase the electricity generation by the same PV panel.

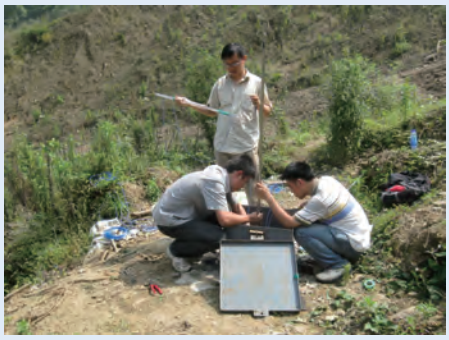
Deteriorating air quality, increasing amounts of wastewater and solid waste, and growing energy consumption have been major environmental problems in densely populated cities such as Hong Kong. These issues pose threats to human health and ecosystem, and impede the potential for urban development. Owing to their extreme complexity and rising mitigation/treatment costs, the solutions to these issues remain elusive. The research on Sustainable Urban Environment explores cost-effective pathways of development in theory and in practice to combat these environmental problems in cities.

Cutting-edge research has encompassed air pollution formation mechanism and abatement strategy, the chemical and biological treatment of wastewater, the generation of energy by harnessing wastewater, wood and food waste, the conversion of different types of waste to construction materials (e.g. eco-block) and carbon-negative materials (e.g., biochar), and the use of renewable energy for energy conversion and seawater desalination. The research findings have contributed to the formulation and evaluation of pollution control policies, and the eco-block technology has been transferred to the private sector and widely used in Hong Kong.

04 Urban Geohazards and Mitigation

There are over 60,000 registered cut-slopes in Hong Kong, where numerous slopes can also be found in natural terrain. Our research efforts are mainly on hazard analyses of cut-slopes and their remediation, as well as hazard analysis and remediation of natural terrain in terms of debris flows. Fatal cut-slope failures have been rapidly reduced in recent years. Thus, the focus has been shifted to the study and monitoring of slopes in natural terrains.

Our efforts on geohazards and mitigation relating to landslides can be classified into two main domains: (1) theoretical, experimental and numerical analyses on landslides, rockfalls and hazards of debris flows; (2) field monitoring technologies for slope monitoring. First, numerical, theoretical, experimental analyses and field studies on debris flows, slope failures, rockfalls and various innovative slope stabilization methods/materials have been conducted at PolyU. Secondly, GIS, GPS, IOT, fibre optic sensors and cloud computing have been employed for slope monitoring in the last few years. Commercial software "Slope 2000" and "Slope3D" were developed and approved by the Buildings Department, and have been used in many large scale/ national projects all over the world. Recently, a Collaborative Research Fund was granted by RGC for building a large-scale debris flow flume.



In-place inclinometers are being installed in a slope in Baichuan, Sichuan Province, China after the Great Sichuan Earthquake

Debris (gravel) flow impact test on a flexible barrier

Impact
Case Studies

Hybrid FRP-Concrete-Steel Double-Skin Tubular Members

Laboratory test of a DSTM

Deck-arch bridge with DSTMs as arch ribs, Anhui Province, China

Fibre-reinforced polymer (FRP) composites have emerged as a class of durable structural materials for new construction, in which the hybrid use of FRP with concrete and steel to form durable, high-performance structures is a very promising direction. Hybrid FRP-concrete-steel double-skin tubular members (DSTMs), consisting of an FRP outer tube, a steel inner tube and a layer of infilled concrete between the two tubes, are an attractive form of such hybrid structural members. Hybrid DSTMs were invented and extensively researched at The Hong Kong Polytechnic University (PolyU). Much of the research undertaken by the PolyU team on hybrid DSTMs has translated into design provisions in the relevant Chinese national standard. A cross-university team in collaboration with Prof. Chen Guangming of South China University of Technology has formed the major basis for the design and construction of a number of bridges in the Chinese Mainland. In these bridges, the section form of hybrid DSTMs has been used as arches (in eight deck-arch bridges with clear spans ranging from 12 m to 36 m), piers (in a pedestrian bridge with a clear span of around 24 m) and girders (in a girder bridge with a clear span of 16 m).

Improving Air Quality through Cutting-edge Research

Comprehensive field study at the Hok Tsui Supersite

Experimental chamber to the formation mechanism of air pollutants

The CEE atmospheric team conducts comprehensive research on photochemical air pollution - a pressing environmental problem in the world's urban and industrialized regions, including Hong Kong. Ozone and fine particulate are major air pollutants. Since January 2018, the team has conducted a series of coordinated laboratory, field, and numerical studies. The major scientific achievements made thus far include the discoveries of the important roles of halogen atoms in air quality in polluted regions, the new source/production pathway of organic particulate matter, and the complex responses of secondary air pollutants to emission controls. Based on the findings, the researchers have recommended additional measures to mitigate winter haze in north China and photochemical smog in south China. The findings have been disseminated to news media to promote public awareness of the importance of academic research and current air pollution.

Sustainable Marine Reclamation Approach and Methods for Settlement Predictions

The use of dredged local marine deposits as fill materials (and/or public fills and wastes) can potentially lead to more economical and faster construction for future large-scale reclamations. Geotechnical Unit of PolyU has proposed a sustainable approach using dredged Hong Kong Marine Deposit (HKMD) slurry and wastes for marine reclamations in Hong Kong with a combined ground improvement method for both dredged HKMD slurry and existing HKMD in the seabed as shown in Figure 1 below.

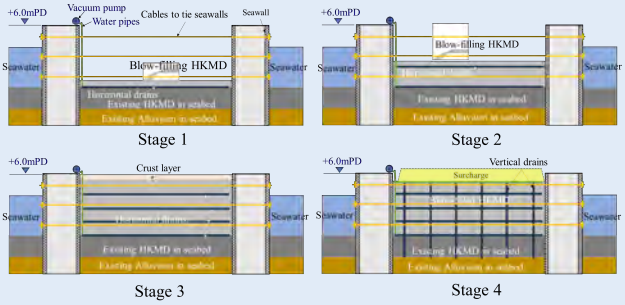


Figure 1. Illustration of a combined ground improvement method for HKMD slurry and existing HKMD in stages

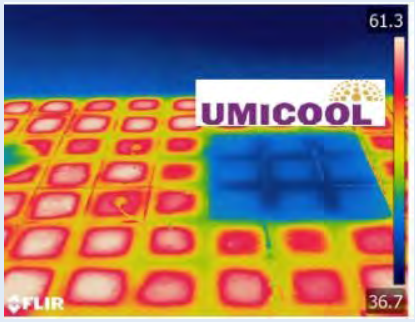
Recently, a prototype field trial was successfully conducted at the Tung Chung New Town Extension project site with the concerted efforts of CEDD-PolyU-AECOM-the site team. The trial was conducted using a pit of 12 m (length) by 8 m (width) by 3.5 m (depth) with a 7-month period. Figure 2 shows the HKMD slurry before (the top photo) and after (the bottom photo) using the combined ground improvement method. After the improvement, the HKMD gained enough shear strength with the water content much reduced; a strong crust layer was formed on the top surface of the HKMD. The study on the use of wastes for reclamation has been carried out, especially on two types of industrial wastes.

The prediction of settlements of newly reclaimed lands on soft soil seabed and existing soft soil grounds under loading is required for designs and safety assessment of structures. Prof JH Yin and his co-workers have developed, verified, and applied two methods for both short-term and long-term consolidation settlement predictions: (a) a fully coupled method using Yin and Graham's elastic visco-plastic models and (b) a de-coupled simple method considering viscous/creep compressions of clayey soils. The two methods have been adopted by Canadian Foundation Engineering Manual (5th Edition), and also used in other countries and regions.

Figure 2. Field trial of the combined ground improvement method at a site in Hong Kong – the HKMD slurry before (the top) and after (the bottom) the improvement

Multiple-functional Coating for Buildings and Infrastructure

Implementation of UMICOOL on a roof



Temperature reduction of the roof by UMICOOL (blue part)

For durability enhancement, surface coating is the most cost-effective way to isolate the building envelope or civil infrastructure from various external hostile environments such as water, UV radiation, carbon dioxide, and chlorides. It can also be incorporated with heat insulation or reflective functions to reduce the thermal gradient between the indoor and outdoor environments of the building so that energy needed to maintain indoor human comfort can be saved. The research team at PolyU has successfully developed an innovative multiple functional polymeric coating, which is eco-friendly, long-lasting, self-cleaning, low-cost, and sub-ambient radiative cooling. The coating can scatter sunlight, convert absorbed UV light to fluorescence emissions, and re-emit infrared radiation into the cold universe. It could reduce the interior temperature of buildings and infrastructure by 6 °C as compared to the ambient temperature under direct sunlight without electricity consumption. The above multiple functional coating has been commercialized as a product called "UMICOOL" by a PolyU Academic-led startup, "Pro-Infra Science & Technology Limited." The relevant research achievements have been published in academic journals and widely covered by mass media like Hong Kong Economic Journal 2020; Ta Kung Pao 2020; Advanced Science News 2000&2002, and "Science" Editor's Choice 2020. The product also received a Gold Medal in the Year 2022's Online Special Edition of the Geneva Inventions Expo. Other types of multiple-functional polymeric or inorganic coatings are also being developed for applications in windows, pavements, containers etc.

Department of Land Surveying and Geo-Informatics

http://www.polyu.edu.hk/lsgi

Established in 1982, the Department of Land Surveying and Geo-Informatics is the only academic unit amongst local tertiary institutions offering a range of programmes and research opportunities in the fields of Land Surveying & Geo-Informatics. Urban Informatics for Smart Cities is the strategic research area of the department, which has three directions: Spatial Big Data Modelling and Analytics, Smart Positioning and Navigation and Urban Sensing and Measurement. The key technologies of the department include land surveying, remote sensing, geographic information science and systems, satellite positioning, photogrammetry and laser scanning, and underground utility imaging and diagnosis. We focus on acquisition, modelling, analysis, and management of spatially referenced data for a wide range of applications. The Department has close links with both international and local academic institutions and the professions. Links with local and overseas professional communities are maintained through our community service and consultancy activities, hence our courses and research are oriented towards the specific needs of Hong Kong, as well as the global market.

Research Focus

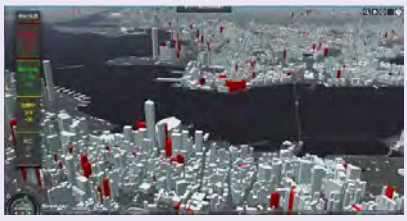
01 Geospatial Technology for Construction and Environment

Geospatial Technology for Quality Living and Environment: GNSS driving

Geospatial technology includes Global Navigation Satellite Systems (GNSS), remote sensing (optical remote sensing, ground penetration radar (GPR), interferometric SAR (InSAR) and LiDAR) and Geographical Information Systems (GIS). The Department of LSGI conducts research on the development of theories and methodologies of GNSS, remote sensing and GIS and application of these technologies.

In theory and methodology, efforts are devoted to some key issues (such as atmospheric effect, reliability, uncertainty, and scale) for precision positioning to measure ground features, underground (utility survey) and under-water (hydrographic survey), robust feature extraction and interpretation from images, reliable mining and analysis of spatio-temporal data. In applications, the department is focused on construction and environment. One of the main research topics is mapping, such as automated updating of topographic map, land cover and change detection, planetary mapping (e.g. Mars and Moon), thematic mapping (environment, socio-economic data) and seabed mapping. New cartographic technology for mapping such as dynamic and animated maps, schematic maps, cartograms, navigational maps and personalized maps. Another main research topic is construction, including the monitoring of structures, land subsidence, ground deformation and landslides; construction management, and underground utility. A focus is the integrated InSAR and GNSS for such applications. The third main research topic is the geospatial technology for environmental studies, including studies of air quality, water quality, vegetation, sea levels, hydrology and glaciers.

02 Urban Informatics for Smart Cities



3D visualization of the spatial distribution of COVID-19 confirmed cases in Hong Kong and the Greater Bay Area.

This is a trans-disciplinary field that draws on three broad domains, i.e. people, place and technology. The focus will be on three areas, i.e. Spatial Big Data Modelling and Analytics, Smart Positioning and Mobility, and Urban Sensing and Measurement.

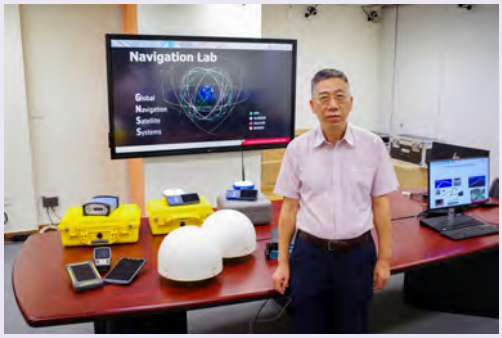
An inter-disciplinary research team at PolyU has been formed to work on solutions for spatial big data modelling for heterogeneous, multi-resolution sources of spatial data; analytical methods for dynamic urban data; as well as analysis and prediction of urban mobility and dynamic behavior based on spatial big data. Recently, attention is also paid to the more automated 3D/4D city modelling with a high level of details and the development of a spatial data infrastructure for smart city development in Hong Kong.

Smart positioning is the core technology to support a mobile internet, location based services (LBS), and the Internet of things (IoT). Satellite-based navigation systems have become the fundamental infrastructure for national security and economic growth. Smart mobility is crucial for a smart city by reducing traffic congestion and pollution, improving transfer speed and human safety, and reducing transfer cost. LSGI has conducted research on navigation technologies and smart mobility for more than 30 years. Research in Urban Sensing and Measurement includes urban heat island research, urban atmosphere monitoring, urban hazard monitoring, urban utility and infrastructure monitoring and management, urban 3D mobile mapping and modeling.

LSGI is developing an international area of excellence in urban informatics. An MSc in Urban Informatics and Smart Cities was launched in 2020 and a PhD research area in Urban Informatics and Smart Cities in 2019. A Smart Cities Research Institute was established in 2020. A comprehensive book with over 900 pages, Urban Informatics, will be published by Springer in 2021. The department also initiated and organized an international conference series: International Conference on Urban Informatics (2017, 2019); established an International Society for Urban Informatics in 2019; and started the International Journal of Urban Informatics in 2019.

Impact
Case Studies

Seamless positioning and navigation in confined urban environments

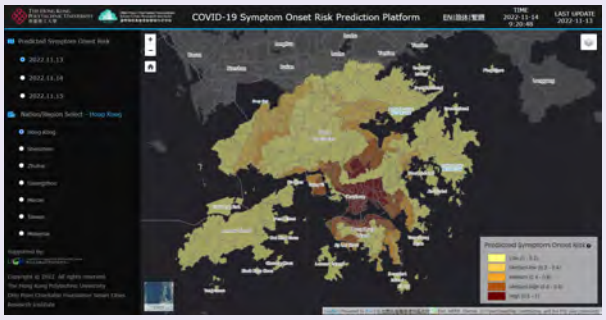


GNSS has revolutionized positioning technologies, and has become a fundamental Positioning, Navigation, and Timing (PNT) service to support global economic growth. However, GNSS does not work well in the urban area as GNSS signals are blocked or reflected by dense buildings. This seriously affects GNSS applications in cities. We have developed various technologies to improve positioning accuracy and availabilities in urban regions. The main contributions are as follows:

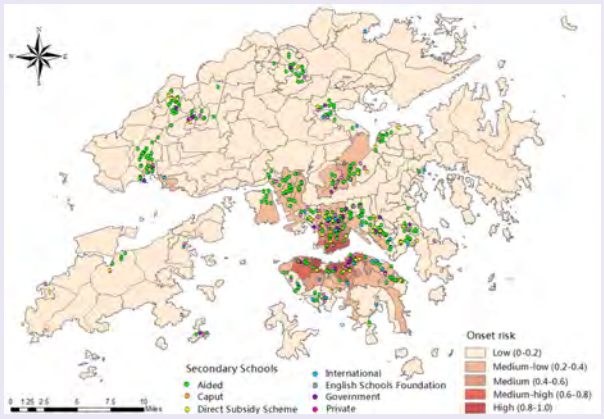
1. Develop a global DGNSS service for mobile phone users for meter level positioning;
2. Reduce the effects of GNSS multipath signals;
3. Propose a new BLE based urban positioning infrastructure to provide PNT service in narrow streets;
4. Develop an absolute height measurements based on barometer inside smartphones;
5. Develop new algorithms for multi-sensor integration for reliable and seamless positioning and navigation.

The research received funds from two ITF projects ($13M), and won a silver medal in the Geneva International Exhibition of Inventions. The technologies developed by us have been applied in the government trials on the seamless positioning infrastructure for Hong Kong.

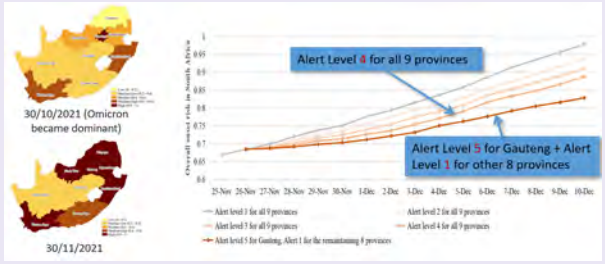
Urban big data analytics for COVID-19 risk prediction and control



The platform developed by the team can deliver daily COVID-19 symptom onset risk prediction in Hong Kong and multiple other countries/regions.



COVID-19 Onset Risk Prediction for Secondary Schools on HKDSE date, as a reference for protecting students during the Examination.



Our model showed that a most strict Alert Level 5 in Gauteng (the epicenter) plus Alert Level 1 in other provinces would be more effective than Level 4 in all provinces in reducing the Omicron onset risk, showing the advantage of targeted epidemic control. This study is highly commented by Dr Gauden Galea, WHO Representative for China.

Research

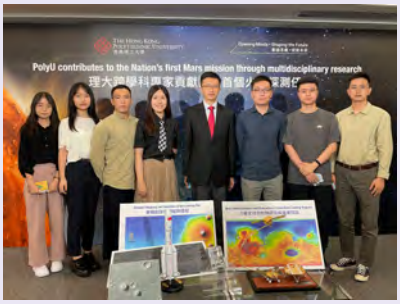
Predicting the risk of COVID-19 and identifying the factors of its spatiotemporal transmission are essential for formulating appropriate anti-epidemic measures. We developed a series of extended Weighted Kernel Density Estimation (E-WKDE) models for short-term prediction of the spatiotemporal COVID-19 symptom onset risk. Compared with most existing COVID-19 risk predictions focusing on confirmed cases, our models can advance the prediction of COVID-19 transmission trend for 4~5 days. The models were used for a) evaluating the contribution of Wuhan lockdown to reducing the onset risk in the rest of China; b) developing risk-based vaccine distribution scheme for Hong Kong; c) studying the transmissibility of different SARS-CoV-2 variants; and d) evaluating the efficacy of anti-epidemic measures worldwide. We also have revealed the associations between intra-city COVID-19 transmission and urban built environment, socioeconomic characteristics, and functionality. These are among the earliest studies of COVID-19 transmission factors in the fine, intra-city scale.

Impact

Since early 2020s, based on the E-WKDE model predictions and other analyses, we submitted over 40 reports to Hong Kong Government as references for evaluating COVID-19 control measures. Dr Gauden Galea, WHO Representative for China, shared our COVID-19 study with WHO Western Pacific Regional Office and commented, "this is an important contribution to our understanding (of Omicron)", and "it is already of great use". We developed a COVID-19 onset risk prediction platform, which can visualize different aspects of COVID-19 risks and help the public to avoid high-risk areas. Based on the study results, we won a CRF project ($6,964,000) and an ITF project (HK$7,776,300) on further developing the COVID-19 onset risk prediction and building a decision-support platform for COVID-19 control (trial user is Hong Kong's then Food and Health Bureau).

Planetary Remote Sensing and Mapping Contributing to Space Exploration Missions

High-precision and high-resolution topographic information for surface hazard analysis and landing site evaluation are vital for the success of any landing mission to planetary bodies. They are also essential for planetary scientific research. An LSGI research group led by Prof. Bo Wu has systematically researched planetary remote sensing and mapping over the past decade. They have advanced research and development in planetary mapping and remote sensing data analysis. A new integrated 3D mapping model has been developed for high-precision and high-resolution topographic mapping of the Moon and Mars, surpassing all existing technologies such as photogrammetry or laser altimetry.



Novel artificial intelligence (AI) approaches have been developed for more automated and robust geomorphological analysis on planetary surfaces. These developments led to a "Gold Medal" at the 44th Geneva International Exhibition of Inventions and Best Paper Award from American Society for Photogrammetry and Remote Sensing. The research work about multiple-source data integration for precision lunar topographic mapping was cited by Nature Index as "a landmark paper on lunar topographic models" in an analysis of the research produced by universities in Hong Kong. The developments and results have been extensively used by the China Academy of Space Technology (CAST) for landing site mapping and evaluation for the Chang'E-3, Chang'E-4, and Chang'E-5 missions to the Moon, and the Tianwen-1 mission to Mars.

Urban Tree Monitoring Using Smart Sensing Technology

While urban trees offer many benefits, those with weakened roots may pose a danger to the public, particularly when their root systems are loosened by weather events such as rainstorms and typhoons. To enable regular tree monitoring for public safety, Prof. Charles Man-sing Wong from LSGI and his team developed a Smart Monitoring System for Urban Tree Management, to conduct large-scale tree monitoring by measuring tree tilts with Smart Sensing Technology. The system uses wireless Smart Sensors attached to lower tree trunks to measure tilt angles, tilt directions, sway trajectories and any unusual movements of trees. Near-real time information is then transmitted from the sensors to a data centre at PolyU for processing and analysis. Alert messages will be triggered once the tilting angle of a tree exceeds a threshold value and immediate mitigation actions can be taken to prevent potential tree fallen cases. This study is the first ever large-scale implementation with over 8,000 trees using Smart Sensing Technology on urban trees in the world. This research has been internationally recognized and awarded a Gold medal in the 2021 Geneva International Exhibition of Inventions and the 2021 Smart 50 Awards.

ACHIEVEMENTS

International Rankings

QS World University Rankings by Subject 2022

#15
Civil and Structural Engineering

#15
Architecture & Built Environment

#46
Environmental Sciences

#3
University Ranking by Academic Performance (URAP) 2021-22
Architecture

#5
University Ranking by Academic Performance (URAP) 2021-22
Civil Engineering

#4
ShanghaiRanking's Global Ranking of Academic Subjects 2022
Civil Engineering

#37
ShanghaiRanking's Global Ranking of Academic Subjects 2022
Remote Sensing

#2
Best Global Universities Rankings 2022 by the U.S. News and World Report
Civil Engineering

Selected Major Research Projects

Research Grants Council (RGC) – Theme-based Research Scheme

Supported Project

Photochemical Air Pollution In Highly Urbanized Subtropical Regions: From Micro Environments To Urban-Terrestrial-Oceanic Interactions

Project Coordinator

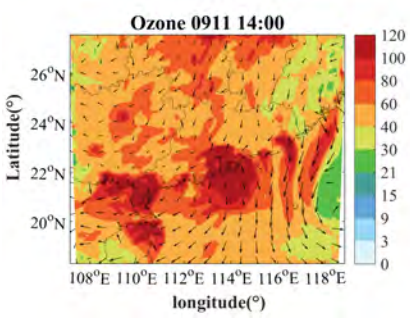
Prof. WANG Tao (CEE)

Funding Amount

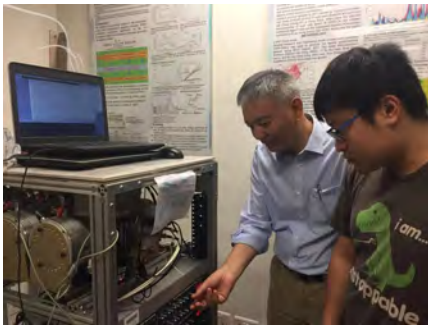
HK$33.33 Million

Photochemical air pollution is a pressing environmental problem facing many urban and industrialized regions of the world. Yet key gaps in understanding the sources and formation mechanisms of photochemical pollution remain, including the role of naturally emitted reactive gases/aerosols, radical sources, complex chemical pathways, and the interactions of pollutants from manmade sources, vegetation and oceans. Addressing these issues is crucial in formulating effective mitigation strategies for urbanized subtropical and vegetated regions. This project is comprehensive research investigating the problem in an urban-terrestrial-oceanic and micro-meso-synoptic paradigm.

Since January 2018, the project has conducted a series of coordinated laboratory, field, and numerical studies. The major scientific achievements made thus far include the discoveries of the important roles of halogen atoms in air quality in polluted regions, the new source/production pathway of organic particulate matter, and the complex responses of secondary air pollutants to emission controls. Based on the findings, the project has recommended additional measures to mitigate winter haze in north China and photochemical smog in south China. The findings have been disseminated to news media to promote public awareness of the importance of academic research and the current air pollution.



Simulated ozone pollution in a photochemical episode in September 2018 in southern China



Prof. Wang working with a PhD student in the lab

Measuring air composition using state-of-the-art instruments

Research Grants Council (RGC) – Theme-based Research Scheme

Supported Project

Sustainable Marine Infrastructure Enabled By The Innovative Use Of Seawater Sea-sand Concrete And Fibre-Reinforced Polymer Composites

Project Coordinator

Prof. YU Tao (CEE)

Funding Amount

HK$52.46 Million

Fibre-reinforced polymer (FRP) composites are gaining increasing acceptance as replacement of steel in conventional reinforced concrete structures in aggressive environments because of their excellent corrosion resistance. The use of FRP composites in concrete structures opens a new avenue for concrete production with the direct use of locally available seawater and sea-sand. This project aims to develop the next generation of sustainable marine infrastructure by the innovative use of seawater sea-sand concrete (SSC) and FRP composites. In March 2020, Prof. YU Tao took over the role of the Project Coordinator from Prof. TENG Jin-Guang who assumed his duty as the President of PolyU in July 2019 and now serves as the Advisory Project Coordinator of the project.

Starting from January 2019, the project team has made significant progress and some breakthroughs. The project team has proposed design mix proportions for SSC and successfully conducted plant trials of producing SSC to demonstrate the technical feasibility. Various innovative forms of FRP-SSC structural members and connections have been proposed and investigated through experimental and theoretical studies. In addition, the team has developed optical fibre-based humidity, pH, chloride and sulphate sensors for monitoring the microenvironment inside FRP-SSC structures. To understand the fundamental mechanism of SSC and FRP, accelerated exposure tests and field exposure tests as well as multiscale numerical simulations have been carried out. Furthermore, based on the research outcomes of the project, FRP-reinforced SSC has been used in a local practical project as paving slabs. Partial results of the project have also become available through publications in international SCI journals.

(a) The outlook of FRP-seawater sea-sand concrete paving slabs at Shatin Sewage Treatment Works after construction; (b) & (c) FRP reinforcement and installed sensors in the paving slabs

Research Grants Council (RGC) – Theme-based Research Scheme

Supported Project

SureFire: Smart Urban Resilience And Firefighting

Project Coordinator

Prof. Asif USMANI (BEEE)

Funding Amount

HK$33.33 Million

The SureFire project aims to develop the world's leading smart firefighting system that can detect the location of fire and personals and forecast the fire develop inside the building fire. SureFire integrates smart building technology, Internet-of-Things (IoT) sensor network, Micro-GIS, computer vision with UAVs, advanced fire modelling, big-data, and Artificial Intelligence (AI) driven forecasting engine. This will require fundamental and interdisciplinary research by an international team of engineers and scientists. The primary team members are from The Hong Kong Polytechnic University, University College London and Tsinghua University. Research partners and collaborators include the Hong Kong Fire Service Department, NIST, Sichuan Fire Research Institute, University of Science and Technology of China, EPCC at University of Edinburgh, Huawei, Ehang, and Ove Arup and Partners.available through publications in international SCI journals.

A high-level framework is proposed (Figure 1) with sub-teams working on each component. The framework relies on a "digital twin" based on computer vision and IoT technologies to dynamically project the physical world into the digital world (Figure 2). The system continuously monitors a building or other infrastructure facility, and in the event of a fire, engages the AI subsystem to begin generating forecasts (similar to weather forecasting) and alerts fire crews to probable critical events and the time and place they may be expected to occur. The prototype SureFire system has been tested in a full-scale room and a large fire testing tunnel to demonstrate the feasibility and effectiveness of the framework in real-time fire forecasting using 3D digital twin models. In the next stage, the research will integrate all technologies to develop a full-scale demonstration at the HK Fire and Ambulance Services Academy and the traing program for fire services to apply this pioneering technology.

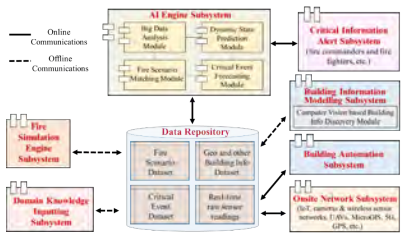


Figure 1: Technical framework

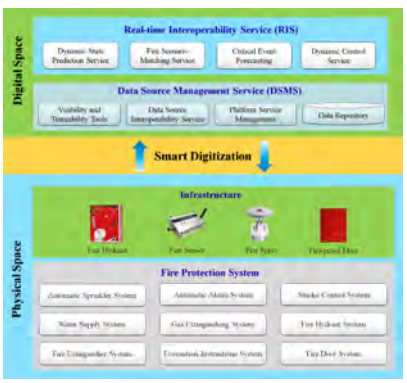


Figure 2: Digital Twin of Smart Fire Fighting System

Research Grants Council (RGC) – Theme-based Research Scheme

Supported Project

Healthy And Resilient City With Pervasive LoCHs

Project Coordinator

Prof. NIU Jianlei (BEEE)

Funding Amount

HK$34.6 Million

Extreme heat waves caused by the Urban Heat Island effect can make urban environments unlivable, resulting in sedentary lifestyles among urban residents and increased energy consumption in the building sector. Based on the team's successful RGC CRF project, which demonstrated that we can create outdoor localised comfort hubs (LoCHs) in high-density urban environments with designs that combine building shading with wind downwash, the objective of this project is to use scientific microclimate design methodologies to maximize thermal and wind comfort and minimize thermal stress risk at the early design and planning stage.

In this five-year project, design methodology will be developed to optimize building forms and architectural masterplans at a neighbourhood scale based on GIS, BIM, microclimate modelling, big data analytics and artificial intelligence programming. Four major objectives make up this project: a) An urban wind and microclimate model to determine how urban morphology affects wind, turbulence and the overall thermal conditions at the ground level, b) A thermo-physiology and human-behavior-based thermal comfort metric to predict people's thermal response to transient and non-uniform outdoor thermal environments; c) a simulation-based optimization platform to assess and optimize design options, and d) Recommended prototype community designs that address population demography and implications to urban renewal and development practice and policy.

Fig. 1 The 1st project annual meeting with government and industry leaders and stakeholders was held in June 2022

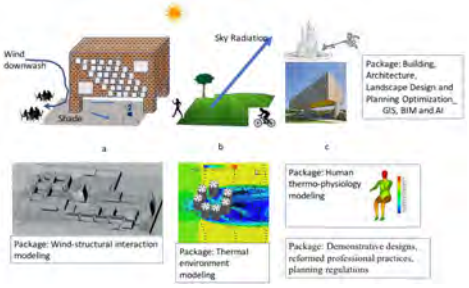


Fig. 2 Creation of "localised comfort hubs" (LoCHs) of various scales

Research Grants Council (RGC) – Theme-based Research Scheme

Supported Project

Unravelling The Black Box Between Air Pollution And Public Health For Transformative Air Quality Management

Project Coordinator

Prof. LI Xiang-dong (CEE)

Funding Amount

HK$44.52 Million

Dominated by fine particulate matter ($PM_{2.5}$), air pollution is the world's greatest environmental health risk factor in both developed and developing economies. Not all components and sources are equally important in toxicity contribution to the combined impact of what people breathe in different parts of the world. Controlling the sources of health-relevant fractions of $PM_{2.5}$ would be a more effective option than managing the entire mass. The theme-based research project (2023-2027) aims to identify the toxic components and their associated sources responsible for $PM_{2.5}$ health effects and to develop effective and economical approaches to manage air quality and public health.

In collaboration with the research strengths in Universities and Research Institutes from Hong Kong, Mainland China, the USA, and other countries, Prof. Li and the research team will decipher the responsible $PM_{2.5}$ components and their mixture effects along the cell-computational-animal-human continuum to answer the long-standing fundamental questions, and, more importantly, to provide scientific evidence and technical support for precise mitigation of health-relevant fractions of $PM_{2.5}$ that is essential for future strategies in a variety of $PM_{2.5}$ pollution scenarios in a global context. In advance of the starting date, collaboration programme and sampling scheme are recently formulated in the committee meetings.

Prof. Li discussing with research team members.

Collection of outdoor $PM_{2.5}$ at a 6-floor roof garden, PolyU.

Air pollution control in Hong Kong is facing challenges to meet the WHO guideline.

Research Grants Council (RGC) – Research Impact Fund

Supported Project

Deeper Understanding Of Color Matching Mechanism For Developing High-Quality Lighting And Imaging Systems

Project Coordinator

Dr WEI Minchen (BEEE)

Funding Amount

HK$5.7 Million

The human beings have the capability to perceive the optical radiations with different spectral compositions to have the same colours. The complete pathway to produce such perception includes the optical radiation, the human's eyes, and the brain. These three components were commonly investigated individually by color scientists, vision scientists, and neuroscientists, and the research findings fail to explain some phenomena. This has introduced great challenges with the development of lighting and display technologies, especially when high power and narrow band sources are becoming popular.

The multidisciplinary research team includes color scientists, vision scientists, and neuroscientists, and various world-leading industry partners, aiming to work together by carefully allocating radiations at different wavelength regions to have a deeper understanding about color matching mechanisms. The results will be used to develop new methods for calibrating high quality lighting and imaging systems.

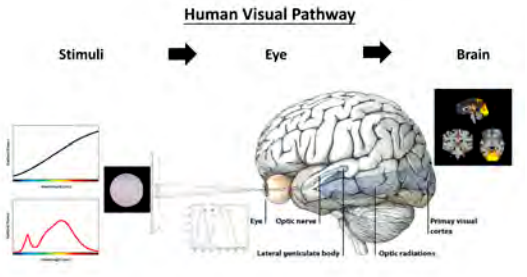


Illustration of human visual pathway to light stimuli, suggesting the necessity to have a multi-disciplinary research team.

Innovation and Technology Fund (ITF)

Supported Project

A Decision-Support Platform For COVID-19 Pandemic Control

Project Coordinator

Prof. SHI Wen Zhong (LSGI)

Funding Amount

HK$7.78 Million

This project aims to develop Hong Kong's first decision-support platform for COVID-19 control based on COVID-19 symptom onset risk prediction. With one-stop workflow for multi-source data management and exchange, computation, decision-support, and visualization, the platform conducts near-real-time and near-automatic prediction of COVID-19 symptom onset risk in each urban community of Hong Kong, and in selected countries/regions which have intensive traffic with Hong Kong. By delivering timely and accurate COVID-19 symptom onset risk predictions, the platform can facilitate the formulation of more precise anti-epidemic measures, to promote lower-cost long-term pandemic control and socioeconomic recovery.

Currently, a public version of the platform has been online to deliver the abovesaid latest daily COVID-19 onset risk prediction. Further decision-support has been also provided to Hong Kong public sectors based on onset risk prediction result, especially for test kit/vaccine allocation and public health measures on social distancing/immigration. With Hong Kong Food and Health Bureau as the trial user in the project, the project is expected to further facilitate the government on long-term epidemic control. The project outcomes have attracted over 50 media reports since 2022, including exclusive interviews from China News (state-level news agency in China), RTHK, Phoenix TV, and Commercial Radio.

The team's public platform delivers daily COVID-19 onset risk prediction result for the future three days after the date of latest available data in Hong Kong and multiple other regions/countries.

The exclusive video interview from China News (state-level news agency in China, shown in this image) on the COVID-19 risk prediction delivered by the project.

Green Tech Fund

Supported Project

Biochar-Enhanced Construction Materials For Sustainable Waste Management And Decarbonisation

Project Coordinator

Prof. Dan TSANG (CEE)

Funding Amount

HK$8.78 Million

Valorisation of biomass waste into innovative biochar construction materials can foster a circular economy through waste valorisation and landfill diversion, which also helps to achieve zero-emission targets. With customised casting or 3D-printing methods, Prof. Tsang's research team at PolyU developed carbon-negative biochar construction materials products to facilitate knowledge transfer of our world-leading advancement of low-carbon concrete construction technology towards carbon neutrality and sustainability. Our deliverables for this project include partition blocks and porous pavers.

Our PolyU technologies innovate the design of biochar construction materials to offer an excellent strength performance and feature a spectrum of added values: (1) thermal insulation; (2) noise reduction; (3) moisture regulation; (4) lightweight; and (5) indoor air quality enhancement, etc. Prof. Tsang's biochar construction materials have been endorsed by several national and international awards and patents, and our pilot-scale production and demonstration projects are underway. With our translational research and transformative innovation, there will be tremendous potential for broad applications of carbon-negative biochar construction materials in Hong Kong, which is a leading innovation hub in the Greater Bay Area.

Visit of Secretary for Environment and Ecology & Director of Environmental Protection Department

Prof Dan Tsang won award for biochar construction materials at Special Edition 2022 Inventions Geneva

Smart Traffic Fund

Supported Project

Smart Assessment Of Bridge Deck Efficiency And Safety In Hong Kong

Project Coordinator

Prof. ZAYED Tarek (BRE)

Funding Amount

HK$8.09 Million

The current transportation network of Hong Kong encompasses approximately 1,430 bridges and flyovers alongside 1,560 footbridges and subways. The average age of bridges recorded more than 30 years. In addition, there are some recent reported collapses of Zhuhai-Macau Bridge and air-bridge evincing expedite signs of deterioration. Visual inspection nowadays is the widely-utilized practice to monitor the performance condition of bridge components. Nevertheless, it is criticized for its qualitative, intrinsic, error-prone and labor-intensive nature. This state of affairs coupled with the high humid weather conditions of Hong Kong, necessitate the development of smart and automated integrated model for evaluating the condition behavior of bridge decks based on scrutinizing the severity levels of encountered surface and subsurface defects.

This task cannot be accomplished without being envisioned on compilation of multi-tier non-destructive evaluation techniques (NDT). Ground penetrating radar is an electromagnetic NDT that is leveraged in this research project to analyze the corrosiveness state of bridge decks. Herein, pre-trained deep learning networks are blended with advanced computer vision technologies for automated creation of corrosion maps. Additionally, non-invasive passive infrared thermography is exploited to create delamination maps capitalizing on studying thermograms obtained from inspecting the surface of bridge decks. A five-point bridge deck efficiency index is proposed as a universal index for prioritizing bridge deck maintenance actions and structuring bridge maintenance decision-making strategies. In the light of foregoing, the developed model is expected to aid the Highways Department of Hong Kong in depicting accurately the critical bridge deck deficiencies, leading to the establishment more reliable and cost-effective bridge deck intervention programs.

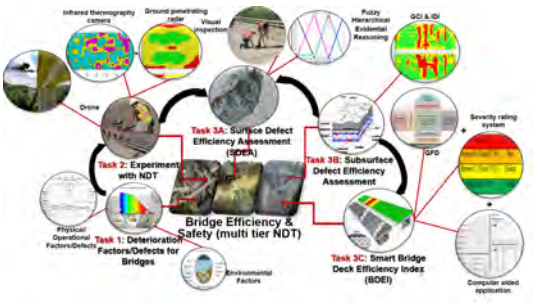


Figure 1: Framework of the developed smart bridge deck inspection model

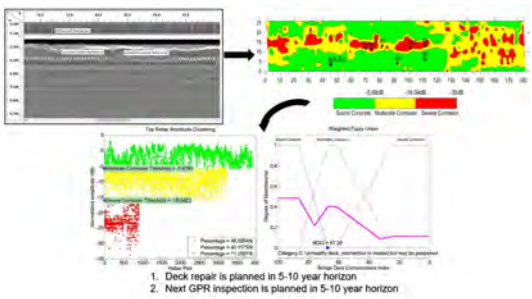


Figure 2: Bridge deck corrosiveness index

NSFC Major Program

Supported Project

Regional Dissemination Of Antibiotic Resistance Genes: Processes And Mechanisms

Project Coordinator

Prof. LI Xiang-dong (CEE)

Funding Amount

RMB 3.17 Million

Antimicrobial resistance (AMR) poses a huge challenge to the health of populations around the world. It is estimated that if not effectively decelerated, the continued rise of drug-resistant infections will claim 10 million lives a year and cost a cumulative 100 trillion USD in economic output by 2050. AMR can be transmitted in the environment via multiple pathways, thereby constituting an integral dimension of the human-animal-environment loop. The NSFC major project aims to understand the transmission processes and mechanisms of ARGs, the genetic entities that confer AMR, in the Air-Water-Soil interfaces in connection with human exposure and public health.

In collaboration with Zhejiang University, the University of Hong Kong, the Centre for Disease Control and Prevention, and others, Prof. Li and the research team undertook a series of metagenomics and culture-based investigations into pathogens and antibiotic resistance in pollution hotspots, such as hospitals, wastewater treatment plants, mariculture, and densely populated centers, to decipher the transmission processes and health risks of AMR in urban areas. An advanced understanding of these issues will be of benefit in devising effective control and management measures to minimize the environmental transmission of AMR, an integral environmental dimension to protecting the health of large populations.

Sample collection in wastewater treatment plants..

Isolation of antibiotic-resistant bacterial strains from mariculture fish samples.

NSFC Excellent Young Scientists Fund (Hong Kong & Macau)

Supported Project

Color Appearance Model And Color Space

Project Coordinator

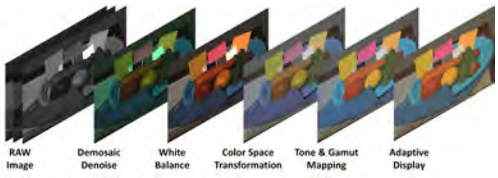
Dr WEI Minchen (BEEE)

Funding Amount

RMB 2 Million

With the popularity of electronic devices in human's daily life, image quality is becoming more and more important. Images are commonly processed in color spaces or color appearance models, so that the adjustments can be correlated to different perceptual attributes. The discrepancies between the different color spaces and color appearance models introduce confusions and inconsistencies for processing images.

This study aims to better understand the differences between perceptual differences and perceptual thresholds under different conditions. It helps to improve the performance of these spaces and color appearance models, so that they can be used to better process the images under different conditions.



Typical image signal processing (ISP) pipeline related to color processing.

List of Research Projects 2021-2022

Research Grants Council (RGC)

Year	Project Title	Staff	Dept	Project Amount (HK$)
	Theme-based Research Scheme			
2021	Healthy And Resilient City With Pervasive LoCHs	Prof. NIU Jianlei	BEEE	$34,604,000
2022	Unravelling The Black Box Between Air Pollution And Public Health For Transformative Air Quality Management	Prof. LI Xiang-dong	CEE	$44,521,000
	RGC Research Impact Fund			
2021	Deeper Understanding Of Color Matching Mechanism For Developing High-Quality Lighting And Imaging Systems	Dr WEI Minchen	BEEE	$5,700,000
2022	Achieving The Circular Economy In Construction Through Deconstruction And Reuse Technologies For Steel And Composite Structures	Dr CHAN Tak Ming	CEE	$9,750,000
	RGC Collaborative Research Fund			
2021	Study Of Carbon Sequestration In Hong Kong's Vegetation: From Present To Future Prediction Under Climate Change	Prof. WONG Man Sing	LSGI	$4,949,639
2022	Subambient Daytime Radiative Cooling Coating For Energy-Efficient Building Envelope	Prof. DAI Jianguo	CEE	$5,384,413
2022	Transmission Of Antimicrobial Resistance From Hotspot Sources To Occupational Populations And Urban Communities	Prof. LI Xiang-dong	CEE	$8,709,120
	RGC Collaborative Research Fund (Equipment Grant)			
2022	Hong Kong Coastal HF-Radar Network	Dr STOCCHINO Alessandro	CEE	$8,000,000
	RGC Collaborative Research Fund (One-off COVID-19 & Novel Infectious Diseases (NIR) Research Exercise)			
2021	Is The Usual Social Distance Sufficient To Avoid Airborne Infection Of Expiratory Droplets In Indoor Environments?	Prof. GUO Hai	CEE	$4,703,090
2021	Spatiotemporal Prediction And Real-Time Early Warning Of COVID-19 Onset Risk	Prof. SHI Wen Zhong	LSGI	$6,964,000
	Young Collaborative Research Grant			
2022	Coastal Urban Flooding Under Climate Change: Evolution Mechanisms And Intelligent Analysis	Dr DUAN Huanfeng	CEE	$4,133,507
	General Research Fund			
2021	Development Of A Low-Noise Broadband Lightning Current Measuring System With A Wide Dynamic Range From Milli-Amperes To Hundreds Of Kilo-Amperes	Prof. CHEN Mingli	BEEE	$838,393
2021	Development Of A Psychoacoustic Machine Learning Assessment Model For Air-Conditioned Building Environments	Prof. MAK Cheuk Ming	BEEE	$911,317
2021	Create Thermally Comfortable Cooling Spot In Outdoor Environments By Active Radiant Cooling	Prof. NIU Jianlei	BEEE	$911,317
2021	Development Of Adaptive Predictive Optimal Chiller Plant Control Strategies For Wide Applications: A Trade-Off Between Precision And Applicability	Dr SHAN Kui	BEEE	$911,317
2021	Colour Appearance Of Virtual Stimuli Produced By Augmented Reality (AR)	Dr WEI Minchen	BEEE	$838,393
2021	A New Thermal Preference And Energy Consumption Model For The Optimal Bathroom Environment	Dr WONG Ling Tim	BEEE	$911,317
2021	Characterization Of Short-Range Interpersonal Contaminant Transport In Enclosed Environments Using Ultra-Sensitive Tracer Gas Method	Dr YOU Ruoyu	BEEE	$911,317
2021	Developing A Computerized Project Success Index System To Monitor And Benchmark The Performance Of Hospital Projects	Prof. CHAN Ping Chuen	BRE	$911,317
2021	Monitoring And Managing Fatigue Of Construction Plant And Equipment Operators Exposed To Prolonged Sitting	Prof. LI Heng	BRE	$911,317
2021	A Study Of The Local Web Buckling Strength Of Coped Beams Subject To Combined Bending, Shear, And Axial Loading	Prof. YAM Chi Ho Michael	BRE	$911,317
2021	Automating Green Building Assessment For The Interior Spaces Of Existing Building Stock Through A Scan-To-Building Information Modelling And Plug-In Software Approach	Dr DARKO Amos	BRE	$911,317
2021	Doubly Stochastic Day-To-Day Traffic Assignment Model With Application To Transportation Network Resilience Analysis	Prof. CHEN Anthony	CEE	$891,600
2021	Constitutive Materials Models Of High Strength S690 Steel Welded Sections And Moment Joints Under Cyclic Actions With Varying Strain Amplitudes	Prof. CHUNG Kwok Fai	CEE	$911,317
2021	Deciphering The Formation And Accumulation Of Photochemical Ozone In The Three Bays Of China Through Field Observations And Model Simulations: Relevance And Uniqueness	Prof. GUO Hai	CEE	$911,317
2021	Transmission And Health Implications Of Airborne Antibiotic Resistance In Urban Areas	Prof. LI Xiang-dong	CEE	$1,139,146
2021	Field And Laboratory Investigations Of Reactive Bromine Gases And Their Impact On Winter Air Quality	Prof. WANG Tao	CEE	$759,431
2021	A New Method To Identify The Fatigue Endurance Limits Of Long-Life Asphalt Pavements Under Actual Loading Waveforms, Evolving Aging States, And Usage Conditions In Hong Kong	Prof. WANG Yuhong	CEE	$911,317
2021	Temperature Behavior Of Long-Span Cable-Stayed Bridges Through The Integration Of Field Monitoring And Advanced Computational Techniques	Prof. XIA Yong	CEE	$911,317

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Deep Learning-Based Multiscale Approach For Granular Materials From Particle Recognition To Mechanical Modelling	Prof. YIN Zhenyu	CEE	$911,317
2021	Ductile FRP-Steel-Concrete Coupling Beams	Prof. YU Tao	CEE	$911,317
2021	Influence Of Shear Connectors On Behaviours Of Square Concrete-Filled Steel Tubular Columns	Dr CHAN Tak Ming	CEE	$911,317
2021	Sulfate Production From Hypobromous Acid (HOBr) Oxidation: Implications For Tropospheric Sulfate And Reactive Bromine Budgets	Dr CHEN Qianjie	CEE	$911,317
2021	Structural Performance And Multivariate Fragility Of Low-Lying Coastal Bridges During Storm Events	Dr DONG You	CEE	$911,317
2021	Multiphysics And Multiscale Study Of Water Migration And Performance Evolution Mechanism Of Bitumen Emulsion Cold In-Place Recycled Mixture	Dr LENG Zhen	CEE	$1,139,146
2021	Performance Investigation Of Twin-Circular Diaphragm Wall Cofferdam Through Field Monitoring And Bayesian Analyses Of Soil-Structure Interactions	Dr LEUNG Yat Fai	CEE	$911,317
2021	Second-Order Direct Analysis For The Design Of Steel Members With Irregular Cross-Sections	Dr LIU Siwei	CEE	$911,317
2021	Multiscale Chemo-Physico-Mechanical Characterization On The Modification Mechanism Of Polyurethane Modified Porous Asphalt Towards Enhanced Moisture Damage Resistance	Dr LU Guoyang	CEE	$918,000
2021	Rise In Summertime Ozone Levels In South China: Impacts Of Long-Range Transport Of Southeast Asia Emissions	Dr LYU Xiaopu	CEE	$911,317
2021	Anisotropic Hydro-Mechanical Behaviour Of Unsaturated And Structured Loess	Dr ZHOU Chao	CEE	$911,317
2021	Investigating The Characteristics Of Column Water Vapor Spatiotemporal Variations During Tropical Cyclone (TC) Using Ground- And Ocean-Based Observation Techniques In Support Of TC Forecasting	Prof. LIU Zhizhao	LSGI	$911,317
2021	Assessing The Impact Of Urban Spatial Context On NO2 Concentrations: A New Perspective Under Variable Socioeconomic Activity Restrictions	Prof. WONG Man Sing	LSGI	$1,120,426
2021	Integrated Image-Based Approaches For Optimized 3D Modeling Of Asteroids From Remote And In Situ Observations	Prof. WU Bo	LSGI	$911,317
2021	Multi-Scale And Multi-Array Ground Penetrating Radar (GPR) Diagnosis Of Underground Hazards	Dr LAI Wai Lok	LSGI	$911,317
2021	Modelling Human Interactions In Physical And Virtual Spaces Using Multilayer Approaches	Dr LIU Xintao	LSGI	$840,000
2022	A New Method For Indirect Measurements Of The Ambient Electrostatic Fields That Produce Fast Breakdowns In Thunderstorms From Onground LF And VHF Observations	Prof. CHEN Mingli	BEEE	$1,041,390
2022	Development Of An Intelligent Auto-Grading System For The Soundscape Of Road Traffic Noise Using Deep Learning	Prof. MAK Cheuk Ming	BEEE	$1,061,150
2022	Development Of Distributed Optimal Control Strategies For Building HVAC Systems For Implementation In Field Control And Smart Sensing Networks	Prof. WANG Shengwei	BEEE	$1,115,452
2022	Energy Sharing Between Medium-Floor Office And Residential Buildings With An Aim For A Selfsufficient And Cost-Optimal Carbon-Neutral Community In The Suburb Region Of Hong Kong	Dr CAO Sunliang	BEEE	$802,220
2022	Development Of A Uniform Color Space For Stimuli Under High Dynamic Range Conditions	Dr WEI Minchen	BEEE	$980,256
2022	Stakeholder Analysis In The Dynamic And Complex Environment Of Megaprojects	Prof. SHEN Geoffrey	BRE	$1,115,452
2022	A Novel Modelling Approach For Predicting Sewer Failure	Prof. ZAYED Tarek	BRE	$1,059,605
2022	Improving On-Site Communication: The Development Of A Cognitive Model And 3D Gesture-Based Interpreter For Construction Machinery Operation	Dr CHI Hung-lin	BRE	$1,115,452
2022	Inspection Work Package On Chain: Dynamic Planning And Accountable Collaboration	Dr LI Xiao	BRE	$786,000
2022	Building Information Modelling-Based Sustainability Evaluation System For End-Of-Life Planning In Temporary Modular Buildings	Dr YANG Yang	BRE	$714,500
2022	Tailoring Next-Generation Travel Demand Models For Future Transportation Systems With Emerging Technologies	Prof. CHEN Anthony	CEE	$821,600
2022	Evaluation Of The Contribution Of Vehicular Emissions On Oxidation And Aging Of Gaseous And Particulate Secondary Products In Urban Roadside Hong Kong	Prof. LEE Shuncheng	CEE	$1,115,452
2022	Temporal Dynamics And Health Implications Of Phage-Bacterium Interactions In Airborne Particulate Matters Of Urban Areas	Prof. LI Xiang-dong	CEE	$1,115,452
2022	Physics-Informed Parameter Identification Of Linear And Nonlinear Structural Systems	Prof. NI Yiqing	CEE	$1,115,452
2022	Designing Metal-Free Biochar Catalysts For Sustainable Biorefinery: An Integration Of Experimental Investigation And Computational Chemistry	Prof. TSANG Daniel CW	CEE	$802,220
2022	Hydrochloric Acid In The Polluted Coastal Atmosphere Of South China: Abundances, Sources, And Impacts	Prof. WANG Tao	CEE	$983,500
2022	Intelligent Knowledge Transfer For Damage Identification Of Steel Structures Using Vibration Data	Prof. XIA Yong	CEE	$1,115,452
2022	Physical Modelling And Theoretical Study Of One-Dimensional Finite Strain Consolidation Of Viscous Soft Soils	Prof. YIN Jian-hua	CEE	$1,115,452
2022	Multiscale Approach For Granular Materials Reinforced By Disposable Face-Mask Chips	Prof. YIN Zhenyu	CEE	$1,113,600
2022	Behaviour And Design Of Stress Concentration Factors Of Cold-Formed High Strength Steel Traditional And Member-Rotated Tubular Joints	Prof. YOUNG Ben	CEE	$931,600

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Rectangular FRP-Confined Double-Skin Tubular Columns With A T-Section-Stiffened Rectangular Steel Tube	Prof. YU Tao	CEE	$1,115,452
2022	Tunable Ultra-Low-Frequency Pendulum Oscillator And Its Application In Wave Energy Conversion	Prof. ZHU Songye	CEE	$1,021,600
2022	Reactive Halogen Production Via Iron-Induced Photochemistry In The Aerosols	Dr CHEN Qianjie	CEE	$929,543
2022	Modeling Of Rock-Socketed GFRP Tube Confined Concrete Pile Under Combined Vertical And Lateral Loadings With Consideration Of Long-Term Degradation	Dr CHEN Wenbo	CEE	$1,115,452
2022	Dynamic Response And Vulnerability Of Coastal Bridges Subjected To Wave Impacts Using Coupled Simulation, Experiment, And Deep Learning	Dr DONG You	CEE	$1,115,452
2022	Transient Air-Water Flows And Wave-Fluid Interactions In Viscoelastic Pipelines In Water Supply System	Dr DUAN Huanfeng	CEE	$1,115,452
2022	Polyelectrolyte Nanofiltration Membranes Via Aerosol-Assisted Printing: Establishing Fabrication-Structure-Performance Relationships Towards Scalable Manufacturing And Applications In Advanced Water And Wastewater Treatment	Dr JIANG Yi	CEE	$1,115,452
2022	Effects Of Urban Airborne Particulate Matter And Associated Toxic Components On Pathogen Receptor Expression In Human Airway Epithelial Cells	Dr JIN Ling	CEE	$802,220
2022	Characterization Of The Interaction Between Asphalt Emulsion And Cementitious Grout In Cold-Mix Semi-Flexible Grouted Macadam Towards A Sustainable Heavy-Duty Paving Material	Dr LENG Zhen	CEE	$1,184,720
2022	Overcoming The Underdetermination: Estimation Of Dynamic Origin-Destination Demands On The Link And Bathtub-Based Road Network With Multi-Source Data	Dr MA Wei	CEE	$664,100
2022	Marine Litter Transport In The Pearl River Estuary And Its Impact On Hong Kong Waters: Formulation And Application Of A Novel Lagrangian Numerical Model	Dr STOCCHINO Alessandro	CEE	$802,220
2022	Performance Assessment Of Diaphragm Wall: From Tremie Concreting To Long-Term Structure Monitoring	Dr TAN Daoyuan	CEE	$1,097,600
2022	Micro-Mechanical Analysis Of Particle Breakage And Fines Migration In Methane Hydrate-Bearing Sediments During Depressurization	Dr WANG Pei	CEE	$1,089,600
2022	Design And Development Of Phenazine Derived Polymeric Anode For Efficient Electrochemical Desalination	Dr WANG Peng	CEE	$962,860
2022	Long-Term Performance Of Geosynthetic-Reinforced Public Fill Over Soft Marine Deposits Improved By Deep Mixing Technique With Sustainable Binders	Dr WU Peichen	CEE	$1,115,452
2022	Development Of CO2 Reactive Green-Cement Using Incineration Bottom Ash (IBA) And Recycled Concrete Fine (RCF) By Low Temperature Clinkering	Dr ZHANG Shipeng	CEE	$1,115,452
2022	Hydromechanical Fatigue Of Rock Joints Under Fluctuating Pore Pressure: Microscopic Observation Under Micro-CT And Constitutive Modelling	Dr ZHAO Qi	CEE	$802,220
2022	GNSS Kinematic Reference Stations With Chip Scale Atomic Clock Aiding For Offshore Real-Time Kinematic (RTK) Positioning	Prof. CHEN Wu	LSGI	$1,115,452
2022	New Multi-Temporal InSAR Technique For Monitoring Stability Of Civil Infrastructures	Prof. DING Xiaoli	LSGI	$864,000
2022	Improving Smartphone GNSS Precise Positioning Accuracy By Using Ensemble-Based Tropospheric Error Corrections From Numerical Weather Prediction High-Resolution Regional Modeling Results	Prof. LIU Zhizhao	LSGI	$911,250
2022	Three-Dimensional Semantic Mapping Of Planetary Surfaces From Multi-Modal Data For Enhanced Scene Interpretation	Prof. WU Bo	LSGI	$1,101,600
2022	Modernization Of The Leveling Network In The Hong Kong Territories	Dr TENZER Robert	LSGI	$264,000
2022	Quantifying Airborne LiDAR Data Artifacts	Dr YAN Wai Yeung	LSGI	$656,900
2022	Reducing Uncertainty In Daily Nighttime Light Remote Sensing Due To Angular And Cloud Effects	Dr ZHU Xiaolin	LSGI	$664,100
	RGC Early Career Scheme			
2021	Modeling And Managing Dynamic Transportation Networks With Heterogeneous Multi-Source Data: An Individual-Oriented Perspective	Dr MA Wei	CEE	$684,765
2021	Direct Observation Of The Evolution Of Joint Surface Roughness And Associated Seismic Signatures	Dr ZHAO Qi	CEE	$684,765
2022	Effective Solar Programme Design And Residential Energy Choices: An Agent-Based Modelling (ABM) Approach To Maximizing Household Participation	Dr LEE Minhyun	BRE	$864,072
2022	Optimal Subsidy Plan For Local Prefabrication Factory Deployment: Maximizing Local Prefabricated Product Usage And Minimizing Transport Emissions	Dr YI Wen	BRE	$658,288
	RGC Postdoctoral Fellowship Scheme			
2021	Research On The Sustainability Of Spent Lithium-Ion Battery Recycling Technology	Prof. TSANG Daniel CW	CEE	$1,308,631
2022	Construction Of A Metabolite Driven Deep Solvent-Catalytic Biorefinery System For Lignin Valorization From Refuse-Derived Biomass	Dr LEU Shao Yuan	CEE	$1,311,041
	Germany/HK Joint Research Scheme			
2021	Stormwater Runoff Filtration And Pollutants Absorption Mechanism Of New-Generation Biochar Modified Permeable Pavement Materials	Dr LU Guoyang	CEE	$85,800
2022	Mass Customization Methodology For High-Rise Modular Buildings: Adaptive Platform, Interactive Configurator, And Decentralized Process	Dr LI Xiao	BRE	$85,800
	NSFC / RGC Joint Research Scheme			
2022	Investigation Of Rainstorm - Storm Surge Joint Occurrence Pattern And Induced Flooding Risk Assessment In Coastal Cities Within The Greater Bay Area (GBA)	Dr DUAN Huanfeng	CEE	$1,244,750

Innovation Technology Commission - Innovation and Technology Fund (ITF)

Year	Project Title	Staff	Dept	Project Amount (HK$)
	Guangdong-Hong Kong Technology Cooperation Funding Scheme (ITF-TCFS)			
2022	Precast Seawater And Sea-Sand Self-Compacting Concrete (SSSW-SCC) Structures Reinforced With Fiber-Reinforced Polymer (FRP) Composites	Prof. YU Tao	CEE	$1,322,500
	Innovation and Technology Support Programme (ITF-ITSP)			
2021	Modeling And Analysis Of Water Pipe Failure: Investigate Causes, Find Solutions, And Develop Potential Strategies, Polices, And Regulations	Prof. ZAYED Tarek	BRE	$7,599,200
2021	A New Membrane-Flood Gate System For Extreme Weather Hazardous Mitigations For Use In Hong Kong And Worldwide	Dr LAI Siu Kai	CEE	$2,340,250
2022	Development Of A Modular Rail Damper Based On Particle Damping Technology For Controlling Rail Corrugation Growth And Broadband Rolling Noise In Railways	Prof. NI Yiqing	CEE	$1,217,200
	Logistics and Supply Chain MultiTech R&D Centre (ITF-LSCM)			
2021	A Decision-Support Platform For COVID-19 Pandemic Control	Prof. SHI Wen Zhong	LSGI	$7,776,300
2022	Smart Data-Driven Building Management Framework For Environmental And Sustainability Applications	Prof. XIAO Fu	BEEE	$5,100,020
2022	Trial: Vision-Based Badminton Match Analysis	Prof. LI Heng	BRE	$7,779,750
2022	Hong Kong GNSS Signal Quality Monitoring And Interference Detection System	Prof. CHEN Wu	LSGI	$8,194,846
	Nano and Advanced Materials Institute (ITF-NAMI)			
2021	Trial: Nanotechnology For Reclaimed Asphalt Pavement (RAP)	Prof. WANG Yuhong	CEE	$700,000
2021	Development Of NAMI's Super Aggregate For High Performance Lightweight Concrete	Prof. POON Chi Sun	CEE	$500,000
2022	Materials & Design For Product-Based Modular Integrated Construction (MiC)	Prof. POON Chi Sun	CEE	$2,000,000
2022	Eco-Materials For Digital Construction By 3D Printing	Prof. POON Chi Sun	CEE	$2,834,800
	Partnership Research Programme (ITF-PRP)			
2022	Development Of Multi-Strength Grade Lightweight Concrete For Modular Integrated Construction (MiC) Applications	Prof. POON Chi Sun	CEE	$1,905,200
2022	Effective Recycling Of Municipal Solid Waste Incineration Bottom Ash For Use In The Construction Industry	Prof. POON Chi Sun	CEE	$2,000,000

Beijing Xiaomi Mobile Software Co., Ltd.

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	LUT For Color Adjustment	Dr WEI Minchen	BEEE	$1,052,281

Building Services Operation and Maintenance Executives Society (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Establishment Of Standard KPIs For Evaluation Of Lift Maintenance Performance In Hong Kong	Dr LAI Hung Kit	BEEE	$300,000

Center for Ocean Research in Hong Kong and Macau

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Hydrodynamic Connectivity And Coherent Regions Over The Pearl River Estuary And Adjacent Shelf	Dr STOCCHINO Alessandro	CEE	$150,000

Construction Industry Council (CIC) Research and Technology Development Fund

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Study Of Artificial Intelligence For Road Surface Depression Detection Using 3D LiDAR Data	Prof. WONG Man Sing	LSGI	$1,380,000
2022	Development of Advanced Seismic Design Guidelines for MiC Buildings In Hong Kong And In The Greater Bay Area	Dr CHAN Tak Ming	CEE	$1,505,580

Environment and Conservation Fund (ECF)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Soundscape Forecast As A Tool To Improve Noise Impact Assessments In The Urban Planning Of Hong Kong	Prof. MAK Cheuk Ming	BEEE	$500,000
2021	Development Of High Performance Acoustic Windows Using Hybrid Control Techniques For Existing Building Retrofit	Prof. MUI Kwok Wai	BEEE	$1,198,400
2021	Hydrothermal Carbonization For Recycling Organic Waste Into Biochar For Soil Improvement In Hong Kong	Prof. TSANG Daniel CW	CEE	$1,216,383
2021	Lightweight Multifunctional Noise Barriers/Noise Enclosures Incorporating Smart Fibre-Reinforced Polymer (FRP) Composites	Prof. YU Tao	CEE	$1,100,000
2021	Detection Of Methane Fugitive Emissions From Landfills Using Drone Based Hyperspectral Remote Sensing	Dr YAO Wei	LSGI	$499,200
2022	Innovative Bifacial Solar Photovoltaic – From Theoretical Model To Its Practical Application In Hong Kong	Prof. LU Lin	BEEE	$494,000
2022	World Meteorological Organization (WMO) - Global Atmosphere Watch (GAW) VOC Expert Workshop (Conference Grant)	Prof. GUO Hai	CEE	$500,000
2022	Recycling Yard Waste Into New-Generation Biochar Adsorbents For CO2 And VOCs Removal	Prof. TSANG Daniel CW	CEE	$1,179,557
2022	Study Of High Purity Oxygen Aeration For Biological Polishing Of Chemical Enhanced Primary Treated Sewage Effluent And Cellulase Production From Sludge	Dr LEU Shao Yuan	CEE	$1,999,800
2022	A Multi-Source Remote Sensing Based Technique For Monitoring Oil Spills	Prof. WONG Man Sing	LSGI	$1,920,520
2022	Climate-Resilient Planning And Design For Coastal Stormwater Drainage Systems	Dr WANG Shuo	LSGI	$490,600

GDSTC 廣東省基礎與應用基礎研究項目

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Ground Penetrating Radar-based Non-Destructive Detection And Intelligent Identification Methods For Hidden Defects Of Tunnel Structure	Prof. NI Yiqing	CEE	$411,915

Global Cement and Concrete Research Network

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	LCCA/LCA For The Comparison Of Different Methods Of Recycling Concrete	Prof. POON Chi Sun	CEE	$1,958,134
2022	Production And Usage Of Carbonated And Uncarbonated Recycled Concrete Fines (RCFines)	Prof. POON Chi Sun	CEE	$1,282,408

Google Research Scholar Program

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Accurate Capture Of Perceived Object Colors For Smart Phone Cameras	Dr WEI Minchen	BEEE	$406,998

Green Tech Fund (GTF)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Biochar-Enhanced Construction Materials For Sustainable Waste Management And Decarbonisation	Prof. TSANG Daniel CW	CEE	$8,784,200
2022	Development Of Nanotechnology Based Hybrid Air Cleaning System Towards Green Transport	Prof. LEE Shuncheng	CEE	$5,561,400
2022	Low-Carbon Transformation Of Construction Materials Using Waste Glass	Prof. POON Chi Sun	CEE	$5,292,875

Hong Kong Observatory (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Potential Collaboration Proposal For Temporal Variations Of Marine Air Conditions Due To The Effects Of Ocean Conditions	Prof. GUO Hai	CEE	$330,000

Huawei Technologies Co. Ltd. (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	從真實場景到多形態顯示的人眼感知映射	Dr WEI Minchen	BEEE	$949,000

Jiangsu Province Science & Technology Department 國際科技合作/港澳臺科技合作

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Collaboration On Development Of An Automatic Calibration System For Accurate Measurement Of Camera Spectral Sensitivity	Dr WEI Minchen	BEEE	$367,590

Lantau Conservation Fund

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Enhancement Of Marine Biodiversity And Ecosystem Functioning Along Lantau Eco-Shoreline With Low-pH Sea-Sand Seawater Eco-Engineered Seawall Panels	Prof. POON Chi Sun	CEE	$2,269,000

Mantus Design and Engineering Ltd. (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Discrete Modeling Of Mechanical Behaviors Of 3D Arbitrary-Shaped Irregular Particles From Micro To Macro With Experimental Validation	Prof. YIN Zhenyu	CEE	$435,000

Marine Conservation Enhancement Fund

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Understanding And Managing The Threats Of Toxic Algae To The Chinese White Dolphin And Finless Porpoise In Hong Kong's Southern And Western Waters	Dr JIN Ling	CEE	$1,120,500

The Ministry of Science and Technology (MOST)

Year	Project Title	Staff	Dept	Project Amount (RMB)
	MOST National Key Technologies R&D Program			
2021	Fundamental Scientific Problems Of Smart Diagnosis For Linear Type Transportation Infrastructures (Sub-project)	Dr WANG Youwu	CEE	¥350,000
	國家科技部政府間科技合作專案			
2021	Development Of Smart Energy Management Technologies For Buildings And Districts In High-Density Cities	Prof. XIAO Fu	BEEE	¥4,120,000

National Natural Science Foundation of China (NSFC)

Year	Project Title	Staff	Dept	Project Amount (RMB)
	NSFC Major Program			
2021	Regional Dissemination Of Antibiotic Resistance Genes: Processes And Mechanisms	Prof. LI Xiangdong	CEE	¥3,172,200
	NSFC Excellent Young Scientists Fund (Hong Kong & Macau)			
2022	Color Appearance Model And Color Space	Dr WEI Minchen	BEEE	¥2,000,000
	NSFC General Program			
2021	Dynamic Modeling Of Urban Structure By Integrating Human Activities In A Hybrid Physical-Virtual Space	Dr LIU Xintao	LSGI	¥490,000
2021	Feature Representation In A Coupled Continuous And Network Space: A New Approach For Travel Demand Forecast For Urban Bike-Sharing Systems	Dr XU Yang	LSGI	¥560,000
2021	Research On Tree Recognition From Airborne Laser/image Based 3D Point Cloud Based On Weakly Supervised Theory	Dr YAO Wei	LSGI	¥540,000
2022	The Effects Of Stable Radicals In Aromatic Secondary Organic Aerosols On Atmospheric Oxidizing Capacity And Aerosol Toxicity	Dr TONG Haijie	CEE	¥550,000
2022	Fine-Scale Urban Vegetation Phenology Detection Based On Multi-Source Remote Sensing Data Fusion	Dr ZHU Xiaolin	LSGI	¥530,000

	NSFC Young Scientists Fund			
2021	Intelligent Early Warning On Failure Of Reinforced Concrete Slab-Column Connections Under Real Fires	Dr WU Xiqiang	BEEE	¥300,000
2021	Research On Non-Contact Recognition Method Of Building Exterior Wall Defects Based On Multi-Modal Fusion	Dr YANG Xincong	BRE	¥300,000
2021	Using Inerter-Based Track Nonlinear Energy Sinks To Mitigate Dynamic Responses Of Offshore Wind Turbines Subjected To Multiple Hazards	Prof. ZHU Songye	CEE	¥300,000
2021	Moisture Gradient Migration, Micro-Structure Development And Cracking Behavior Of The Bitumen Emulsion Cold Recycling Mixtures	Dr JIANG Jiwang	CEE	¥300,000
2021	Estimating Dynamic Origin-Destination Demand With Multi-Source Traffic Data On Large-Scale Networks	Dr MA Wei	CEE	¥300,000
2021	Multi-Modal Representation Learning-Based Multi-Level Recognition For Mixed Urban Functions Of High-Density Cities	Dr CAO Rui	LSGI	¥300,000
2022	Public Housing System And Its Mechanism, Microstructure, And Path-Optimization: A Study Based On Heterogeneous Agent Decision And Dynamic Spatial Equilibrium In China	Dr FAN Ying	BRE	¥300,000
2022	Work Package Dynamic Optimization And Intelligent Collaboration In Industrialized Construction	Dr LI Xiao	BRE	¥300,000
2022	Investigation Of Rare-Earth Halide Solid Electrolyte For All-Solid-State Li-air Batteries	Dr LIU Tong	BRE	¥300,000
2022	Intelligent Unmanned Autonomous Systems (IUAS)-Based Construction Progress Management	Dr YI Wen	BRE	¥300,000
2022	Study On Mechanism And Optimization Of Self-Powered Semi-Active Electromagnetic Damping For Vibration Control	Dr CAI Qinlin	CEE	¥300,000
2022	Field Measurements And Modeling Of Atmospheric Reactive Chlorine Species In Wintertime Northeast China	Dr CHEN Qianjie	CEE	¥300,000
2022	Mechanism Of Wind Load Reduction By Surface Blowing/Suction Method For High-Speed Trains And Optimization Strategy Under Wind Environment	Dr CHEN Zhengwei	CEE	¥300,000
2022	Study On The Influence Of Coking Process Of Pyrolysis Products On Formation And Toxicity Of Black Carbon Particles From Biomass Combustion	Dr HAN Yong	CEE	¥300,000
2022	Research On The Generalization Of The Localization Model Of The Components Of The Catenary Support Device On Different Lines Of The High-Speed Railway	Dr LIU Wenqiang	CEE	¥300,000
2022	Nontargeted Identification And Formation Mechanism Of High-Risk Brominated Byproducts Formed During Ozonation	Dr LU Yao	CEE	¥300,000
2022	Chemical Processes And Impacts On Ozone Formation Of Peroxyacetyl Nitrate In High-Altitude Background Atmosphere Of Central China	Dr LYU Xiaopu	CEE	¥300,000
2022	Multiscale Analysis Of The Effect Of Particle Breakage On The Behavior Of Hydrate Bearing Sediments And Fines Migration	Dr WANG Pei	CEE	¥300,000
2022	Multi-Scale Parallel-Hybrid Computational Mechanism Of The Complex Dynamic System And Its Application	Dr YUAN Peng	CEE	¥300,000
2022	Automatic Detection And Interpretation Of Secondary Craters Based On Spectral And Spatial Characteristics	Dr WANG Yiran	LSGI	¥300,000

Ove Arup & Partners Hong Kong Limited (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Background Air Quality Monitoring And Air Purification Control Technologies For The Green Deck	Prof. LEE Shuncheng	CEE	$1,740,000

Philip K. H. Wong Foundation (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Implementation Of A Humanized Adaptive Baseline Information Technology (HABIT) System	Prof. MUI Kwok Wai	BEEE	$1,000,000

Public Policy Research Funding Schemes

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Costs And Benefits Of Undertaking BEAM (Building Environment Assessment Method) Plus New Building Assessments In Hong Kong	Dr CHAU Chi Kwan	BEEE	$565,169
2021	Evaluation Of Impact Of Policy Interventions On The Building Information Modelling (BIM) Adoption Status In The Hong Kong Construction Industry: From A Comparative Perspective	Prof. LI Heng	BRE	$409,400
2021	Regulatory Framework And Guidelines For Drone Applications In The Hong Kong Architecture, Engineering And Construction Industry	Dr YANG Yang	BRE	$460,000
2021	Evaluation Of 'Over-Tourism' Phenomenon In Hong Kong Using Machine Learning And Social Media Data	Dr LIU Xintao	LSGI	$223,100
2022	Study On The Critical Influencing Factors And Policy Effectiveness Improvement Of The Collaborative Governance Of The Construction And Demolition Waste Recycling Chain In Hong Kong	Prof. LI Heng	BRE	$310,270
2022	Energy Efficiency Retrofitting Of Existing Buildings For Carbon Neutrality In Hong Kong: Policy Recommendations And Guidelines For Overcoming The Challenges	Dr DARKO Amos	BRE	$359,543

2022	Tackling Ageing Buildings And Facilitating Urban Transformation: Optimization Of Floor Area Ratio Regulation In Hong Kong's Urban Renewal Process	Dr FAN Ying	BRE	$598,000
2022	Towards People-Centric Smart City Development: Investigating The Citizens' Preferences And Perceptions About Smart-City Services In Hong Kong	Dr WEI Hsi-Hsien	BRE	$469,401
2022	Incorporating Spatial Heterogeneity Of Rainfall Response To Climate Change Into The Design Of Slope Drainage Provisions In Hong Kong	Dr WANG Shuo	LSGI	$470,350
2022	Identifying And Prioritizing Development Zones For Green Roofs In Hong Kong: A Geospatial Smart City Way Towards Carbon Neutrality	Dr YAO Wei	LSGI	$599,150
2022	Developing Low-Cost Remote Sensing System For Detecting Illegal Dumping Of Construction Waste In Hong Kong	Dr ZHU Xiaolin	LSGI	$281,060

Shenzhen Municipal Science and Technology Innovation Commission

Year	Project Title	Staff	Dept	Project Amount
	深圳市科技計劃-基礎研究項目			
2021	Lithium-ion Battery Fire Dynamics Under Extreme Storage And Transport Environment And Smart Fire detection	Dr HUANG Xinyan	BEEE	¥400,000
	深港澳科技計劃項目(C類項目)			
2021	Study On Automatic Recognition And Maintenance Of Surface Defects Of High Rise Buildings In Smart City	Prof. LI Heng	BRE	$1,219,057
2022	Development And Application Of 3D Printed Composite Filtration Membranes	Dr JIANG Yi	CEE	$1,170,000

Shenzhen Poxon Machinery Technology Co.,Ltd.

Year	Project Title	Staff	Dept	Project Amount (RMB)
2022	Finite-Discrete Modeling Of Mechanical Behaviors Of Heterogeneous Rocks With Irregular Inclusion Or Voids From Micro To Macro With Experimental Validation	Prof. YIN Zhenyu	CEE	¥823,500

Shenzhen Virtual University Park Management Center 自由探索類基礎研究項目

Year	Project Title	Staff	Dept	Project Amount (RMB)
2021	Sensing Mechanism Study Of Two-Dimensional Flexible Material Under Multi-field Coupling Condition	Prof. NI Yiqing	CEE	¥200,000

SKLMP Seed Collaborative Research Fund

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Establishing Species-Specific Neuronal Cell Lines For Bioanalytical Assessment Of Contaminant Cocktails In Chinese White Dolphins And Finless Porpoises	Dr JIN Ling	CEE	$289,600

SmartiNSights Co., Ltd (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Developing Indicators Of Destination Attractiveness And Competitiveness Through Big Data	Dr XU Yang	LSGI	$143,478
2022	Development Of Travel Recommendation System Using Machine Learning And Emerging Tourism Big Data	Dr XU Yang	LSGI	$286,957

Smart Traffic Fund

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Network-Wide Traffic Speed-Flow Estimator	Prof. LAM Hing Keung William	CEE	$1,976,187
2022	The Smart Charging Development Of Zero-Emission Autonomous Electric Vehicles By The X2V And V2X Technologies With Respect To The Dynamic Traffic, Grid And Energy Information	Dr CAO Sunliang	BEEE	$2,205,792
2022	Smart Assessment Of Bridge Deck Efficiency And Safety In Hong Kong	Prof. ZAYED Tarek	BRE	$8,099,657
2022	Development And Deployment Of An AI-Enabled Parking Vacancy Prediction Framework Using Multi-Source Data	Dr MA Wei	CEE	$985,034
2022	Road Safety Assessment Using Advanced Driving Simulation Approach With 3D Geo-Spatial Model	Dr SZE Nang Ngai	CEE	$1,456,138

Sports Science and Research Funding Scheme

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Cycling Track Video Intelligence	Prof. LI Heng	BRE	$7,481,279

State Key Laboratory of Internet of Things for Smart City (University of Macau)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Smart Method For Early Defects Detection And Long-Term Risk Monitoring Of Diaphragm Wall Based On High-Resolution Distributed Fiber Optic Sensing Technology	Dr TAN Daoyuan	CEE	$100,000
2022	Physics-Informed Multi-Fidelity Residual Neural Networks For Analyzing Internal Erosion In Soils	Dr ZHUGE Chengx-iang	LSGI	$100,000

State Key Laboratory Open Fund

Year	Project Title	Staff	Dept	Project Amount (RMB)
2022	Monitoring Of The Ionospheric Anomalies In Low Latitude Areas	Prof. CHEN Wu	LSGI	¥100,000

The Hong Kong Asphalt (Green) Limited (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Research And Development Of Sustainable Pavement Materials And Technologies	Dr LENG Zhen	CEE	$1,000,000

V-fun Technology HK Limited (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Assessing Construction Labor Market Demand Through Web-Crawling	Prof. LI Heng	BRE	$5,000,000

Zhong Shan Engineering Company Ltd (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Adopting 3D Point Cloud Throughout Construction Project Lifecycle For Better Project Management	Prof. LI Heng	BRE	$5,000,000

哲庫科技(上海)有限公司 (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Investigation Of Color Space For Rendering HDR And WCG Images	Dr WEI Minchen	BEEE	$1,306,505

威海點石國際貿易有限公司 (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Key Technologies For Urban Positioning, Navigation, And Timing (Pnt) Infrastructure	Prof. CHEN Wu	LSGI	$800,000

榮耀終端有限公司 (Collaborative)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	Color Management For High Quality Display	Dr WEI Minchen	BEEE	$1,961,250

深圳市智岩工程科技有限公司 (Donation)

Year	Project Title	Staff	Dept	Project Amount (HK$)
2021	Study Of Micromechanical Behavior Of Soft-Rigid Granular Mixtures	Prof. YIN Zhenyu	CEE	$300,000

華為終端有限公司

Year	Project Title	Staff	Dept	Project Amount (HK$)
2022	UCS-I Model	Dr WEI Minchen	BEEE	$873,940

External Prizes and Awards 2021-2022

Dept	Staff	Prizes/Awards (Granting Authority)	Co-recipient(s)
BEEE	Dr HUANG Xinyan	2021 Jack Bono Award (The Society of Fire Protection Engineers)	
BEEE	Dr HUANG Xinyan	2021 Ricardo Award (Institute of Physics)	
BEEE	Dr HUANG Xinyan	Editor-in-Chief's Featured Article (Fire Safety Journal, 2021)	GAO Jian
BEEE	Dr HUANG Xinyan	第二屆全國熱安全科學與技術研討會優秀論文 (全國熱安全科學與技術研討會組委會, 2021)	JIANG Yaqiang WANG Zilong
BEEE	Dr WEI Minchen	2021 Google Research Scholar Award (Google)	
BRE	Prof. Eddie HUI	Appointed as Justice of Peace (HKSAR Government)	
BRE	Prof. Meng NI	WSSET Innovation Awards 2020/21 - Power Generation Technologies category (World Society of Sustainable Energy Technologies)	
BRE	Prof. Geoffrey SHEN	Built Environment Project and Asset Management Highly Commended Paper Award (Paper Title: "Dynamic Supply Chain Capability Analysis of Hong Kong-Zhuhai-Macao Bridge Construction: A Topic Modeling Approach") (The 9th World Construction Symposium 2021)	Anushika EKANAYAKE MUDIYANSELAGE Mohan M. KUMARASWAMY XUE Jin
BRE	Dr Daniel CHAN	Awardees of HKIS Sponsorship Scheme for Textbook Writing 2020 (The Hong Kong Institute of Surveyors)	Timothy OLAWUMI
BRE	Dr Daniel CHAN	Highly Commended Paper Award 2022 in Public Private Partnerships: Past, Present and Future category (Paper Title: "Potential for PPP in the Next Wave of Smart Infrastructure: In Smart Villages and Rural Infrastructure") (CIB W122 Sessions)	Nimesha Sahani JAYASENA Mohan M. KUMARASWAMY
BRE	Dr Jeff SHEN	Pacific-Basin Finance Journal (PBFJ) Best Paper Award 2022 (Paper Title: "CSR Disclosure and Corporate Innovation: Evidence from China") (2022 Asian Finance Association Annual Conference)	
BRE	Dr Ivy WONG	Certificate of Merit - The Hong Kong Institute of Planners (HKIP) Awards 2020 (Project Title: "WAAT: A New Approach for Assessing Outdoor Walking Accessibility to Public Open Space in Hong Kong Territories") (The Hong Kong Institute of Planners)	TANG Bo Sin WONG Kiu Ho Kenneth TANG Siu Sing Kenneth
CEE	Prof. CHAU Kwok Wing	Clarivate Analytics Web of Science Highly Cited Researcher 2021 (Engineering) (Web of Science, Clarivate Analytics)	
CEE	Prof. CHEN Anthony	Best Paper Award - Transportation Research Board 101st Annual Meeting 2022 (Paper Title: "Is It Necessary to Relax IID Assumptions in the LOGSUM-based Accessibility Analysis") (Transportation Research Board of the National Academies)	
CEE	Prof. CHUNG Kwok Fai	Commendation Merit - Structural Excellence Award 2021 (R&D Award) (Paper Title: "Experimental Evidence on Structural Adequacy of High Strength S690 Steel Welded Joints with Different Heat Input Energy") (The Hong Kong Institution of Engineers Structural Division)	HO Ho Cheung, HU Yi Fei, WANG Kai, LIU Xiao, XIAO Meng, David A. NETHERCOT
CEE	Prof. DAI Jianguo	2021年華夏建設科學技術獎一等獎 (Project Title: 建築結構防火關鍵技術與工程應用)(華夏建設科學技術獎勵委員會)	許清風, 李國強, 查曉雄, 傅傳國, 趙金城, 樓國彪, 張晉, 陳玲珠, 蔡文玉, 章誼, 韓重慶, 王卓琳, 鄭士舉, 李勇生
CEE	Prof. DAI Jianguo	Commendation Merit - Structural Excellence Award 2022 (R&D Award) (Paper Title: "Flexural Performance of UHPC-Concrete-ECC Composite Member Reinforced with Perforated Steel Plates") (The Hong Kong Institution of Engineers Structural Division)	HUANG Bo-Tao WENG Ke-Fan ZHU Ji-Xiang
CEE	Prof. DAI Jianguo	Gold Medal - 2022 Inventions Geneva Evaluation Days - Virtual Event (Project Title: "UmiCool: An Eco-friendly Smart Sub-ambient Radiative Cooling (SSRC) Coating") (International Exhibition of Inventions of Geneva)	
CEE	Prof. DAI Jianguo	JSCE International Outstanding Collaboration Award 2021 (Japan Society of Civil Engineers)	
CEE	Prof. GUO Hai	Chang Jiang Scholars Chair Professor (Ministry of Education, China, 2021)	
CEE	Prof. LAM Hing Keung William	國家教育部2020年度高等學校科學研究優秀成果獎 (科學技術) - 自然科學獎二等獎 (中華人民共和國教育部)	
CEE	Prof. LAM Hing Keung William	ISMT Lifetime Achievement Award - The 4th International Symposium on Multimodal Transportation (ISMT 2021) (Southeast University, Nanjing)	
CEE	Prof. LEE Shun Cheng	Clarivate Analytics Web of Science Highly Cited Researcher 2021 (Cross-Field) (Web of Science, Clarivate Analytics)	
CEE	Prof. NI Yiqing	Chang Jiang Scholars Chair Professor (Ministry of Education, China)	
CEE	Prof. TSANG Chiu Wa Daniel	Silver Medal - 2022 Inventions Geneva Evaluation Days - Virtual Event (Project Title: "Carbon-negative Climate-smart Biochar Partition Block") (International Exhibition of Inventions of Geneva)	
CEE	Prof. TSANG Chiu Wa Daniel	Best Associate Editor Award 2020, Critical Reviews in Environmental Science & Technology (Taylor & Francis Group)	

Dept	Staff	Prizes/Awards (Granting Authority)	Co-recipient(s)
CEE	Prof. TSANG Chiu Wa Daniel	Clarivate Analytics Web of Science Highly Cited Researcher 2021 (Engineering; Environment and Ecology) (Web of Science, Clarivate Analytics)	
CEE	Prof. XIA Yong	Commendation Merit - Structural Excellence Award 2021 (R&D Award) (Paper Title: "Analytical Solution to Temperature-induced Deformation of Suspension Bridges") (The Hong Kong Institution of Engineers Structural Division)	ZHOU Yi CHEN Bo FUJINO Yozo
CEE	Prof. ZHU Songye	Grand Award - Structural Excellence Award 2022 (R&D Award) (Paper Title: "Electromagnetic Shunt Damper for Bridge Cable Vibration Mitigation: Full-Scale Experimental Study") (The Hong Kong Institution of Engineers Structural Division)	LI Jin-Yang SHI Xiang SHEN Wenai
CEE	Dr CHAN Tak Ming	The Nishino Prize 2022 - the 17th East Asia-Pacific Conference on Structural Engineering & Construction (The East Asia-Pacific Conference on Structural Engineering and Construction)	
CEE	Dr CHEN Wenbo	Fugro Prize 2021-2022 - 1st Runner-up (Paper Title: "Study on Engineering Characteristics of Cement Stabilised HKMD") (The Hong Kong Institution of Engineers Geotechnical Division)	HO Tsz On
CEE	Dr DONG You	2021 ASCE's Outstanding Reviewer - ASME Journal of Risk and Uncertainty in Engineering Systems, Part A: Civil Engineering (American Society of Civil Engineers)	
CEE	Dr DUAN Huanfeng	Willi H. Hager JHR Best Reviewer Award 2019-2020 (International Association for Hydro-Environment Engineering and Research)	
CEE	Dr DUAN Huanfeng	2022 Karl Emil Hilgard Hydraulic Prize (Paper Title: "Experimental Investigation of the Effects of Air Pocket Configuration on Fluid Transients in a Pipeline") (American Society of Civil Engineers)	Jane ALEXANDER, LI Zhao, Pedro LEE, Mark DAVIDSON
CEE	Dr JIANG Yi	2021 Environmental Science: Nano Outstanding Peer Reviewer (Royal Society of Chemistry)	
CEE	Dr LENG Zhen	Excellent Paper Award - 2021 World Transport Convention (Paper Title: Prediction of the Low-temperature Cracking Resistance of In-situ Asphalt Mixture Using Machine Learning Technique") (WTC Executive Committee)	
CEE	Dr WANG Jinghua	Baker Medal - ICE Publishing Awards 2021 (Paper Title: "Modelling of Focused Wave Interaction with Wave Energy Converter Models Using QaleFOAM")(Institution of Civil Engineers, UK)	WANG Junxian, YAN Shiqiang, MA Qingwei, XIE Zhihua, Sarah MARRAN
CEE	Dr WANG Peng	2021 Distinguished Alumni Award - Zijin Quanxing Environmental Foundation (Nanjing University) 2021 傑出校友獎 - 紫金全興環境基金 (南京大學)	
CEE	Dr WANG Peng	Innovative Individual Award (Innovative Researcher) - The Mohammed bin Rashid Al Maktoum Global Water Award (UAE Water Aid Program)	
CEE	Dr WU Peichen	2021-2022 Ringo Yu Prize for the Best PhD Thesis in Geotechnical Studies (The Hong Kong Institution of Engineers Geotechnical Division)	
CEE	Dr ZHOU Chao	The 2020 Excellent Young Scientists Fund (Hong Kong and Macau) (National Natural Science Foundation of China)	
LSGI	Prof. WU CHEN	Silver Medal - 2021 Inventions Geneva Evaluation Days - Virtual Event (Project Title: "Seamless Navigation in Urban Environment" - Project funded by Logistics and Supply Chain MultiTech R&D Centre) (International Exhibition of Inventions of Geneva)	
LSGI	Prof. John W.Z. SHI	Research Team of the Year (Highly Commended), The Royal Institution of Chartered Surveyors Award 2021 (The Royal Institution of Chartered Surveyors)	
LSGI	Prof. John W.Z. SHI	Fellow of Academy of Social Sciences (UK) (Academy of Social Sciences)	
LSGI	Prof. John W.Z. SHI	2021 CPGIS Distinguished Scholar Award (The International Association of Chinese Professional in Geographic Information Sciences)	
LSGI	Prof. John W.Z. SHI	2021 Smart 50 Awards (Project Title: "A Comprehensive Spatial Analysis and Onset Risk Prediction Platform for the COVID-19 Pandemic in Hong Kong") (Smart Cities Connect)	
LSGI	Prof. John W.Z. SHI	Gold Medal - 2021 Inventions Geneva Evaluation Days - Virtual Event (Project Title: "Smart City Platform: A Comprehensive System for Spatial Data Infrastructure") (International Exhibition of Inventions of Geneva)	
LSGI	Prof. Charles Man Sing WONG	Silver Medal - 2022 Inventions Geneva Evaluation Days - Virtual Event (Project Title: "Responsive Web-based Solar Irradiation Map with Solar Energy Calculator for Hong Kong" - Project funded by the Electrical and Mechanical Services Department) (International Exhibition of Inventions of Geneva)	
LSGI	Prof. Charles Man Sing WONG	2021 Smart 50 Awards (Project Title: "First-Ever Smart Tree Monitoring Project Using Low-Power Wireless Network for Urban Forestry and Tree Management") (Smart Cities Connect)	ZHU Rui, KWOK Yin Tung Coco, LI Hon, SUN Jialin, TSANG Chiu Wong Tony
LSGI	Prof. Charles Man Sing WONG	Gold Medal - 2021 Inventions Geneva Evaluation Days - Virtual Event (Project Title: "Smart Monitoring System for Urban Tree Management") (International Exhibition of Inventions of Geneva)	KWOK Yin Tung Coco LI Hon SUN Jialin
LSGI	Prof. WU Bo	2021 ESRI Award for Best Scientific Paper in Geographic Information Systems (Paper Title: "Topographic and Geomorphological Mapping and Analysis of the Chang' E-4 Landing Site on the Far Side of the Moon") (American Society for Photogrammetry and Remote Sensing)	LI Yuan LIU Wai Chung Liu CHEN Long

Dept	Staff	Prizes/Awards (Granting Authority)	Co-recipient(s)
LSGI	Prof. WENG Qihao	2021 Outstanding Service Award (China Geography Specialty Group, American Association of Geographers)	
LSGI	Prof. WENG Qihao	Foreign Member of Academia Europaea, 2021 (The Academy of Europe)	
LSGI	Prof. WENG Qihao	The AAG Fellow, 2021 (American Association of Geographers)	
LSGI	Prof. WENG Qihao	The AAIA Fellow, 2021 (Asia-Pacific Artificial Intelligence Association)	
LSGI	Prof. WENG Qihao	John R. Jensen Distinguished Lecturer, 2021 (AAG Remote Sensing Specialty Group)	
LSGI	Prof. WENG Qihao	The GRSS Distinguished Lecturer, 2021-2023 (IEEE Geoscience and Remote Sensing Society)	
LSGI	Dr XU Yang	2022 CPGIS Young Scholar Award (The International Association of Chinese Professionals in Geographic Information Sciences)	
LSGI	Dr XU Yang	Best Paper Award - The 5th Global Tourism and Hospitality Conference (Paper Title: "Understanding and Modelling Tourist Intra-City Destination Choice Using Mobile Phone Data")	MAI Ke PARK Sangwon CHEN Anthony
LSGI	Dr XU Yang	First Prize - Huawei ICT Competition Global Final 2021-2022 (Cloud Track) (Huawei Technologies Co., Ltd.)	ZHONG Xiuming FENG Yunlin TANG Man-Kit
LSGI	Dr XU Yang	Third Prize - Huawei ICT Competition Asia Pacific 2021-2022 (Cloud Track) (Huawei Technologies Co., Ltd.)	ZHONG Xiuming FENG Yunlin TANG Man-Kit
LSGI	Dr XU Yang	First Place - IFITT Journal Paper of the Year Award 2022 (Paper Title: "Characterizing Destination Networks through Mobility Traces of International Tourists - A Case Study Using a Nationwide Mobile Positioning Dataset") (The International Federation for Information Technology and Travel & Tourism)	LI Jingyan Alexander BELYI PARK Sangwon
LSGI	Dr XU Yang	First Prize - Huawei ICT Competition Hong Kong SAR (Huawei Technologies Co., Ltd.)	ZHONG Xiuming FENG Yunlin TANG Man-Kit

RESEARCH PLATFORMS

Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch)

http://www.polyu.edu.hk/cnerc-steel/en/

The CNERC for Steel Construction (Hong Kong Branch) is established to promote sustainable infrastructure development through effective use of constructional steel materials and modern technology in structural engineering. The core objectives of the CNERC are:

- To establish a high-level technological platform to enable effective design and construction of modern building and civil engineering structures to promote sustainable infrastructure development in Hong Kong.
- To advance technological capabilities of the Hong Kong Construction Industry in design and construction of super high- rise buildings, long span bridges and buildings of large enclosure using high performance materials in Hong Kong and overseas.

The CNERC for Steel Construction (Hong Kong Branch) is dedicated to promote technological developments and internationalization of the steel construction industry in both Hong Kong and China. It is actively engaged with international as well as national exchanges in research and development of steel construction. By conducting various research and development projects, the CNERC will compile design recommendations for application of high strength steel materials in Hong Kong and beyond. This will facilitate the export of steel materials and structural steelwork to overseas construction projects.

At the end of 2021, the CNERC has a total staff of 60, who are mainly research personnel.

Selected major achievements

Research for Innovative engineering applications

The CNERC for Steel Construction (Hong Kong Branch) was appointed by the Development Bureau (DEVB) as an expert consultant to provide the following technical guidance to various public works departments:

- To improve structural design of various steel structures using the S690 steel to enhance structural efficiency and reduce steel tonnages.
- To provide technical information on various steel materials together with appropriate welding procedures, and also supply of Chinese high-strength S690 steels.
- To compare design methods and parameters for various members, joints and connections in accordance with the Hong Kong Steel Code and the European Structural Steel Design Code.
- To develop an efficient supply chain on Chinese steel materials and structural steelwork in the Greater Bay Area together with appropriate acceptance and quality control requirements.

Consultancy project on welding technology and quality control on Q690 welded sections as well as their resistances against fatigue and fracture in the Cross Bay Link in Tseung Kwan O

- This Bridge was designed by an internationally renowned bridge consultant in Hong Kong in accordance with European Standards.
- It was constructed by a leading Chinese contractor and manufactured by a major steel manufacturer in China using high quality Chinese steel.
- The construction of this Bridge meets fully the construction standards and specifications of the Civil Engineering and Development Department based on international practice of construction projects.

Compression tests on S690 welded H-piles

DEVB Pilot Projects

TKO Bridge Project

Chinese National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong Branch)

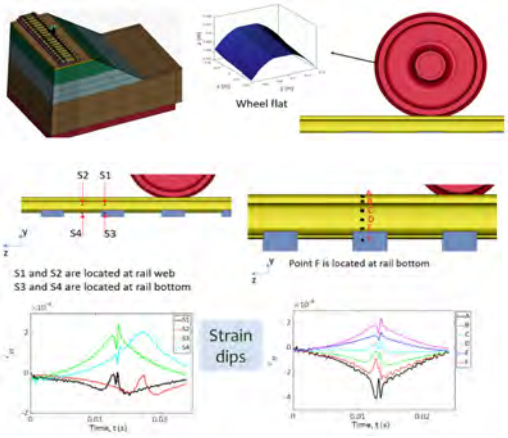
http://www.polyu.edu.hk/cnerc-rail/

The Hong Kong Branch of Chinese National Rail Transit Electrification and Automation Engineering Technology Research Center (CNERC-Rail) at The Hong Kong Polytechnic University (PolyU) is dedicated to technological innovation and the transfer of knowledge, contributing to the further development of railway engineering.

Over the past year of 2021, the CNERC-Rail has achieved significant breakthroughs in its research collaborations with world-leading universities, research institutes and enterprises, pioneering research to develop smart sensing, health monitoring, and control technologies to ensure the stability and safety of the railway. The developed technologies have been applied to several railway lines, including the Hong Kong MTR, the Shenzhen metro, the Wenzhou metro, the Guangzhou metro, the Guangxi metro, the Fenghuang maglev, the Changsha maglev express, and the Shanghai maglev test line. The mission of the CNERC-Rail is to develop state-of-the-art monitoring technologies, embracing smart materials and applying advanced big data analyses for assessing and monitoring railways. The findings from CNERC-Rail have accelerated the construction of intelligent rail transit (i.e., high-speed rail, metro and maglev systems) and ensure safety and reliability to the public. Furthermore, the influence of the research outcome could promote innovative monitoring technologies for rail transit from Hong Kong to Asia and worldwide.

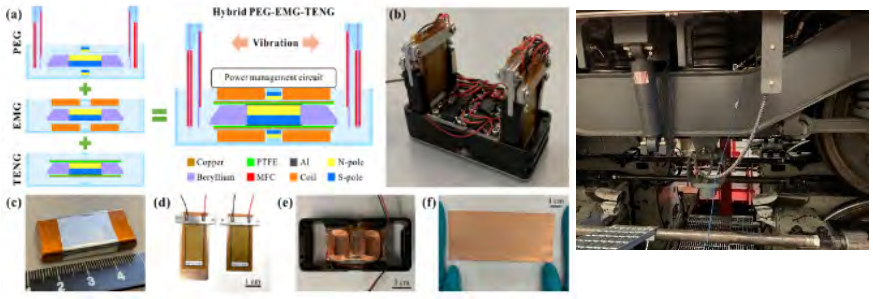
Main research projects include:

- RIF (Research Impact Fund) project: enhancing safety, punctuality and ride comfort of railway transportation: from local metro system to global high-speed rail network
- Joint MOR-NSFC key research program: fundamental theories and key technologies for intelligent operation and maintenance of high-speed railway bridges
- Vibration & noise control for Wenzhou urban rail rapid transit system, Hong Kong MTR, Shenzhen metro, Hangzhou metro
- Intelligent health monitoring for the maglev system
- Rolling test on train bogie for energy harvester design
- Online health monitoring for the Nanning metro line
- A machine vision system for automatic inspection of rail
- Development of a new rail particle damper
- UGW-based damage detection for rail wheel axles
- Data-driven approaches for rail condition assessment
- Bolted joint looseness monitoring in railway systems
- Trackside acoustic diagnosis



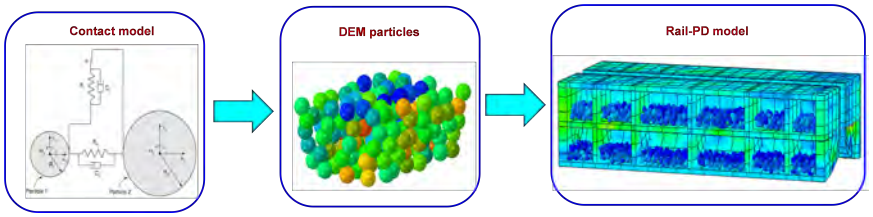
Field Measurement and Inspection to Study Wheel/ Rail Wear (RIF Project)

Vibration & Noise Control for Wenzhou Urban Rail Rapid Transit System



Development of Energy Harvester

Online Health Monitoring for Nanning Metro Line



A Novel Rail Particle Damper

Intelligent Health Monitoring for Maglev System

Research Centres

CAS GIG-PolyU Joint Laboratory of the Guangdong-Hong Kong-Macao Greater Bay Area for the Environment

The Joint Laboratory of the Guangdong-Hong Kong-Macao Greater Bay Area for the Environment, established by the Chinese Academy of Sciences' (CAS) Guangzhou Institute of Geochemistry (GIG) and PolyU, is one of the highly innovative and interdisciplinary laboratories in the Greater Bay Area (GBA). Led by Prof. Pingan Peng, an academician of CAS, and Prof. Xiang-dong Li, Dean of PolyU's Faculty of Construction and Environment (FCE), the joint laboratory aims to integrate the strengths of both parties in the fields of environmental science basic research and engineering technology, focusing on environmental pollution in the development of the GBA and providing scientific, technical support for the continuous improvement of its environmental quality with advanced technology.

By combining the research strengths from the fields of environmental pollution and engineering, the joint laboratory has developed substantive collaboration and exchanges between CAS and higher education institutions in Hong Kong, which led to scientific achievements in the areas of water, soil, and air pollution. Its establishment has reinforced the geographical advantages of GIG in collaborations between Guangdong and Hong Kong, aligning with national development strategies for the Greater Bay Area. Over the coming years, the joint laboratory will strive to achieve first-class research accomplishments, and to play a matchless intellectual role in the GBA for pollution control and environmental sustainability.

CAS IEE-PolyU Joint Laboratory for Aerosol and Environment

The Joint Laboratory for Aerosol and Environment, affiliated with the Institute of Earth Environment, Chinese Academy of Sciences (IEECAS) and the Hong Kong Polytechnic University, is codirected by Prof. Jun-ji CAO and Prof. Shun-cheng LEE. The Joint Lab aims to nurture cutting-edge research in aerosol sciences and air pollution control technologies. The establishment of the Joint Lab provides bilateral postgraduate students and researchers with invaluable training and bridges substantive and sustainable collaborations with world renowned research groups for translating laboratory research into tremendous societal and commercial value at large.

Successions of scientific achievements have resulted from original research in the areas of the physical–chemical–biological processes of mineral dust, black carbon, organic aerosol and PM2.5 in the atmosphere and scaling-up applications of air pollution control technologies, making significant impacts both nationally and internationally. The Joint Lab is stepping up on the international stage as an important organization in aerosol research and taking full advantage of a closely integrated approach with laboratory analysis, numerical modeling, field experiment, and technology innovation to enhance air quality.

In the foreseeable future, the Joint Lab will develop into a national innovation center for aerosol science both in China and internationally, provide a high-level training base for aerosol scientists, and guide the direction of aerosol research in China, substantially contributing to the sustainable development of society. Prof. Jun-ji CAO was recently promoted to the Institute Head of Atmospheric Physics, CAS in Beijing. He will continue to support our joint lab in the future.

Colour, Imaging, and Metaverse Research Centre

In recent years, imaging devices—sensors, cameras, and displays—are undergoing rapid development. They are used to capture, process, analyse, generate, and visualize information for various technologies and applications, such as smartphones, metaverse related devices (i.e., virtual reality, augmented reality, and mixed reality), remote sensing and positioning, unmanned aerial vehicles (UAV), autonomous vehicles, and etc. PolyU has an excellence in all these relevant research areas, with a strong track record in securing large research grants (i.e., Research Impact Fund from Research Grant Council) and collaborating with world-leading industrial partners (e.g., Facebook, Google, Huawei, DJI, XiaoMi, etc) in recent years.

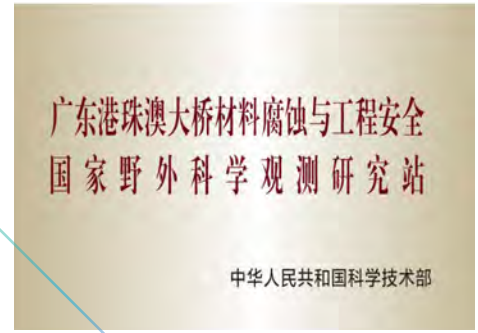
The Colour, Imaging, and Metaverse Research Centre is unique in Asia, with a goal to become the world's leading centre to carry out high-impact fundamental research related to colour and imaging science, and to develop better solutions for different technologies. In particular, it is the first research centre to focus on metaverse in the world, aiming to be the pioneer in exploiting the potential to use metaverse for treatment, rehabilitation, education, and design. The inter-disciplinary research team is comprised of many young researchers and will continuously work together to secure large research grants and industrial collaborations or even establish start-ups, bringing great impacts to both academia and industry.

Global Geophysical Fluids Center

https://www.polyu.edu.hk/lsgi/ggfc/index.html

The Special Bureau for Hydrology (SBH) is one of the three operational centers of the Global Geophysical Fluids Center (GGFC), which was established by the International Earth Rotation and Reference Systems Service (IERS) on IERS's 10th anniversary day January 1, 1998, in an effort to expand IERS's services to the scientific community. The GGFC consists of three operational centers (Special Bureaus for the Atmosphere, Ocean and Hydrology), each representing a major component of the Earth geophysical fluids system, and a non-operational center for models of the core, mantle, and tides. The SBH is responsible to coordinate research activities related to continental water. The main goals are to collect and distribute datasets and numerical model results related to the changing distribution of water over the planet, especially over land, that are of interest to the geodetic community. Geodetically interesting applications include estimating changes in the gravity field, geocenter, earth rotation, and load deformation of geodetic sites. These variations are of direct interest to the IERS and the community which it serves in the interpretation of earth rotation changes, improved definition of the terrestrial reference frame, and improvements in the quality of geodetic observations. Prof. Jianli Chen in LSGI has been serving as the SBH chair since 2004. The SBH had been hosted by the Center for Space Research, University of Texas at Austin since its inception until April 2022, and LSGI/PolyU has now taken over the responsibility. The new SBH website (https://www.polyu.edu.hk/lsgi/ggfc/) is still under construction and more data products will be migrated and added to the new site.

National Observation and Research Station of Material Corrosion and Structural Safety of Hong Kong-Zhuhai-Macao Bridge in Guangdong (Representative PI: Prof. Xia, Y.)



The National Station is jointly formed by the Hong Kong-Zhuhai-Macao Bridge Authority, CCCC Fourth Harbour Engineering Research Institute Co. Ltd., Nanjing Hydraulic Research Institute, and the Hong Kong Polytechnic University. It focuses on long-term observation of the operation environment, material corrosion, and structural performance of the Hong Kong-Zhuhai-Macao Bridge. It will continuously collect primary research data related to bridge safety, scientifically assess and predict the in-service condition of the bridge, and develop advanced technologies for intelligent construction, operation, and maintenance of major projects in China's transportation industry.

HKPolyU-Wuhan University Partner GNSS Research Centre

The GNSS Research and Development Center of Wuhan University is a highly respectable innovation center both within the Chinese mainland and in the international arena specializing in GNSS research. Similarly, LSGI has a world renowned team focusing on cutting-edge GNSS research. The combined strengths of the PolyU-Wuhan University Partner GNSS Research Centre will certainly take the GNSS technologies to the next level of excellence, benefitting our daily lives in a variety of ways.

PolyU-WHU Partner GNSS Center established at LSGI

Research Centre for Environmental Technology and Management

https://www.polyu.edu.hk/cee/research/research-centre-for-environmental-technology-and-management/

The Research Centre for Environmental Technology and Management has been established to integrate and strengthen the existing expertise in environmental engineering and management into a leading centre of excellence in the Greater Bay Area. Its strategic objectives are to carry out translational research to develop pollution abatement and management technologies for the society, to transfer the developed technologies and know-how to local and regional users, and to educate environmental engineers/scientists and other professionals by providing for their continuing professional development. The aim of this Centre is to establish a regionally reputable centre for environmental research and education.

In particular, the Research Centre is currently dedicated to the low-carbon disassembly and recycling of key components of new energy vehicles. We have designed the intelligent diagnosis, pollution-free dismantling, and sustainable regeneration route of the end-of-life power battery of electric vehicles (EVs). For instance, we strive to advance the green extraction of high-value critical metals (lithium, cobalt, nickel, and rare earths) and pollution control of high-risk fluorides in key components. Our goal is to provide cost-effective solutions for sustainable management and recycling of new energy vehicles in Hong Kong to boost the attainment of global decarbonization.

Research Centre for Fire Safety Engineering

https://www.polyu.edu.hk/beee/web/rcfires/index.html

Research in fire safety is one of the three main themes of the Department of Building Environment and Energy Engineering (BEEE). The newly established Research Centre for Fire Safety Engineering, led by Professor Asif Usmani, includes five BEEE faculty members and distinguished professors from other PolyU departments and overseas universities. The fire hazard presents a formidable challenge to the resilience and sustainability of communities and economic activities in HK, where some of the densest urban environments abound. The Guangdong-Hong Kong-Macao Greater Bay Area is also home to some of the most ambitiously integrated infrastructures in the world, such as the Guangzhou-Shenzhen-HK Express Rail Link and the HK–Zhuhai–Macau Bridge-Tunnel, which face big fire-safety challenges. Costs due to losses from fires are estimated at approximately 1 per cent of global GDP per year.

Research Centre for Geo-Information Science and Technology

http://www.lsgi.polyu.edu.hk/RCGIST/

The Research Centre for Geo-Information Science and Technology in the Department of Land Surveying and Geo-Informatics aims to conduct specialised research in geoinformation science and technology, promote external research collaborations, promote applications of the latest research outputs, and provide services to the local and international communities. The Centre consists of three laboratories: the Laboratory for Environmental Change (LEC) which is concerned with the monitoring of environmental changes and natural hazards; the Laboratory for Integrated Navigation Technologies (LINT), focusing on integrated navigation technologies and information systems; and the Cyber City Laboratory (CCL), which conducts research on technologies for the development of cyber cities.

Research Centre for Geo-Information Science & Technology

Research Centre for Sustainable Infrastructure Development

http://www.polyu-szbase.com/ASP/content.asp?pid=28&cid=96

The Shenzhen Research Center for Sustainable Infrastructure Development is directed by Professor Shun-cheng LEE, affiliated with the Department of Civil and Environmental Engineering of The Hong Kong Polytechnic University and established at The PolyU Shenzhen Base. The Research Center provides professional consultancy services to address community needs in sustainable infrastructure development both in Hong Kong and mainland China, including air quality assessment and control, wastewater management and control, intelligent transportation systems, large-scale structural health monitoring and maintenance, development, and research of new materials for construction, environment, and green energy.

The Center is stepping up on a cross-field stage supported by five top-notch laboratories of PolyU, taking full advantages of its world-renowned research groups and advanced equipment. Each of the laboratories has its special research direction and excellence. The Air Quality Lab is dedicated to the research of indoor and outdoor air pollution management and control. The Transportation and Highway Engineering Lab is dedicated to the research of road materials and transportation systems. The Structural Engineering Lab is dedicated to the research of safety diagnosis, monitoring of large-scale civil structures, and application of new generation smart technologies. The Environmental Engineering Lab aims to scale-up applications of pollution abatement and management technologies in practice. The Energy Source Lab drives research and innovation on renewable energy and the urgent issue of global warming. In the foreseeable future, the Center will be part of the University's network to create better professional outputs and services of societal and commercial values locally and internationally.

Research Centre for Urban Hazards Mitigation

https://www.polyu.edu.hk/fce/research/faculty-research-centre/research-centre-for-urban-hazards-mitigation/

The Research Centre for Urban Hazards Mitigation was established by the Faculty of Construction and Environment in 2002 to conduct focused and multidisciplinary research on the consequences of natural and man-made hazards in urban areas as well as to develop innovative engineering methods and new technologies for monitoring and mitigating damages to urban infrastructures. It facilitates knowledge dissemination and technology transfer to the Government and related industries through specialist consultancy, continuing professional training as well as undergraduate and postgraduate education. The Centre focuses on the effects of windstorms and earthquakes on tall buildings and long-span bridges and the effects of landslides. The Centre is also actively investigating the effects of global climate change on urban infrastructure as well as multi-hazard assessment and mitigation.

The fire at a mini-storage on 21 June 2016 in Ngau Tau Kok, Hong Kong, that claimed the lives of two firemen

Selected Research Laboratories

Department of Building Environment and Energy Engineering

Fire Laboratory

The Fire Laboratory is located on the 10th floor of the Z block of The Hong Kong Polytechnic University, and it is the only research laboratory in Hong Kong that can perform large-scale fire tests. The Laboratory has the following state-of-the-art equipment and unique facilities:

- Fire suppression test chamber: For conducting sprinkler tests and water mist and drencher experiments. Thermocouples trees and data loggers monitor the performance of fire suppression.
- Smoke detection test chamber: Addressable fire detection system to facilitate detector response experiments. Both chambers are installed with smoke extraction fans that provide an extraction rate of 600 L/s.
- Cone calorimeter: For measuring flammability of materials and the release rate of heat and visible smoke, based on ASTM E1354 standard.
- Critical oxygen index apparatus: It measures the minimum oxygen concentration to support candle-like flame of fuel, based on the standard of ASTM D2863.
- Three smoke exhaust hoods: Students can conduct bench scale fire experiments under the hood with a smoke extraction rate of 50 L/s.
- Wind tunnel: This self-developed wind tunnel can control the temperature and velocity of wind to test the sensitivity of sprinkler and heat detector.
- Fire-detection control panels: Students can operate the fire control panel to understand the fire-protection systems.
- H-Tris System: Advance high-intensity radiant panel to heat structural element and demonstrate structural failure under fire.
- STA-IR system: It measures the ignition temperature, heat of decomposition, and emission characteristics of materials to quantify their fire hazard.

Research students conducting experiments to demonstrate a fire tornado in the laboratory

Indoor Environmental Quality Laboratory

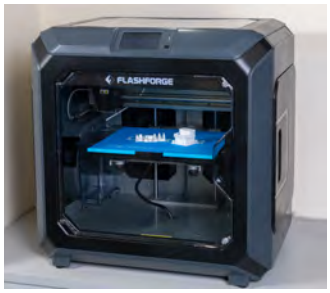
Comfort, health, and productivity of occupants are the top considerations in the design and operation of modern buildings, while high building energy efficiency is essential for a low carbon economy. This lab supports our research activities for the development of technologies that achieve good indoor air quality with minimal energy use. The Laboratory has the following state-of-the-art facilities:

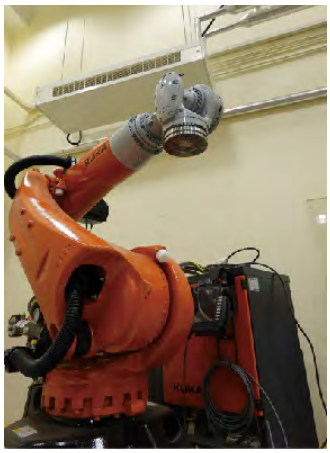
- FLEC (European standard Field and Laboratory Emission Cell) for the characterization of IAQ pollutant emission from common building materials
- SF6 tracer gas, a harmless gas that does not exist in nature, multiple dosing and sampling system for ventilation and pollutant (such as infectious pathogens) dispersion studies
- Instruments for monitoring indoor air pollutants like Radon, VOCs (Volatile Organic Compounds), aerosols, O3, CO, CO2, and indoor environmental parameters such as air temperature, relative humidity and air velocity
- Three thermal manikins that can simulate human body heat generation, and one with an artificial lung for the study of inhaled air quality
- Computational fluid dynamics (CFD) software and high performance PC for simulating air flow, temperature, and pollutant dispersion both indoors and in building surroundings
- Multiple sets of mobile mini weather stations for outdoor thermal comfort study: radiosity, wind speed and directions, globe and air temperature and air humidity
- A Particle Image Velocimetry (PIV) system that provides a detailed mapping of both the flow pattern and turbulence structure of localized 2-dimensional airflow field
- Thermal imaging camera system and accessories

Intelligent Building Laboratory

The Intelligent Building (IB) Laboratory facilities include a comprehensive IB system, a full set of building automation systems, test rigs for IoT-enabled building automation, VR and AI-enable building energy facility management, grid-interactive building technology and energy-flexible building technologies as well as a variety of measurement instruments for building energy monitoring. The IB lab provides test facilities for teaching and learning as well as for R&D on intelligent building technologies, the development of advanced building system control, energy management, diagnosis strategies and communication software.

Building Technology Laboratory





Building Technology Laboratory was founded in the year 1995 supporting teaching and research of BRE Department. With the continuous input of resources and efforts in enhancing the laboratory, Building Technology Laboratory consists of three sections, including Material and Mechanical Testing, 3D Concrete Printing, and Robotics for Construction.

On the teaching front, students can learn the various techniques, such as manipulative, observational and analytical, through laboratory work. They can also learn how to conduct a proper experimental investigation and to use the modern instrumentation technology for experimentation. Through hand-on practical laboratory experiment approach, students can learn how their theoretical learning and technological ideas are applied to practical real world.

The laboratory provides demonstration classes and hands-on building technological experiments on structural mechanics, concrete testing, non-destructive techniques for building diagnostics and inspection, and digital fabrication in construction. Computer-based learning and simulation software, such as Matlab, ANSYS, Revit, and Dynamo, have also contributed to the teaching and learning of temporary formwork and false work design, scaffolding and excavation techniques, reinforced concrete beam and column design, and computational design for digital construction with robotics and 3D printers etc.

Besides providing traditional building technology services and support to teaching experiments and dissertation projects, our laboratory function has been enhanced substantially in the field of building health monitoring, non-destructive building material testing, digital construction with robotics, and 3D printing in construction. Our ultimate ambitious objective is to make this laboratory a specialist centre on a number of new building and construction technologies.

Cave Automatic Virtual Environment (CAVE) system (housed in CARE Resources Centre)

A Cave Automatic Virtual Environment (CAVE) system is a user-engaging space consists of large display equipment and sensory feedback, where the user has immersive experience under the generated virtual reality environment and be able to interact with the scene. It is installed in BRE to provide 4D (3D + time) immersive experience and BIM/GIS related content to facilitating teaching and research works. The virtual scenes and the immersive experience are generated through projectors to directed to between four of the walls (big screens) of a room-size cube.

Users can engage the realistic visual experience in the CAVE, and the physical input of the users control the viewing positions and angles of the virtual scenes. Joysticks allow the user to interact with the environment, further immerse themselves in the pre-set scenarios for simulations. Optionally, users wearing stereoscopic glasses with the support of certain software in the CAVE can generate the senses of 3D perceptions, further conveying intuitive spatial information. CAVE is connected with a graphic workstation, called process unit, which is responsible for generating high-resolution images to be projected on the walls or floor with correct positions.

Visualization software engines is provided to be integrated into graphic workstations to rendering the scenes and create the interactive functionalities for researchers/developers to develop BIM/GIS related teaching/research contents rapidly. They provide easy-accessed functions for importing BIM and GIS models, also supports as-built data formats, like laser-scanned point clouds, photogrammetric images etc. Comparing with personal head mount devices, CAVE provides immersive senses as good as those devices. Further advantages are comparatively significant on accommodating multiple users as a group at once, improving the user collaborative and interactive experience in the virtual scene, and running in a non-contact way with more comfort to users.

Smart Infrastructure Management Systems Laboratory

The mission of the Smart Infrastructure Management Systems Laboratory is to foster world class excellence in research, training and technology transfer activities in the important area of sustainable civil infrastructure. The emphasis is on the research and development of effective design, rehabilitation, and management strategies. The strategic research activities will address a timely need in Hong Kong and the mainland China, in addition to its international leadership, in pressing problems such as: deteriorating infrastructure, response to extreme loading events, effective design, and resource management and sustainability.

The Smart Infrastructure Management Systems Laboratory houses high tech equipment and multi-sensing technologies which are relevant to construction and infrastructure engineering and management. The available technologies in the lab include high speed heavy weight drone, noise loggers, micro-electro-mechanical-sensors (MEMS), piezoelectric sensors, flow and level sensors, sewerbatt, and two tower cranes models for modular construction simulations.

Air Pollution Laboratory

Air laboratory is a well-established laboratory in providing air pollution study at institutional level and serving to general public in Hong Kong since 1982. The main function of the Air Pollution Laboratory consists of three main categories, namely criteria air pollutant measurements, volatile organic compounds and organic aerosol measurements and indoor air quality (IAQ) study.

Criteria Gas Pollutant Measurement

Gas pollutant analyzers are utilized for getting real-time air quality data at station networks located in rural and urban areas. Ozone / Carbon Monoxide / Carbon Dioxide / Sulphur Dioxide / Nitrogen Oxides / Methane and Non-methane Analyzers provide comprehensive criteria pollutants monitoring in the air which are considered hazardous to human health.

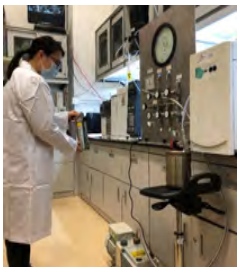
Air Toxic Measurement

GC/MSD/FID/ECD are used to analyze VOCs in canister samples. Inter-laboratory comparison is regularly conducted between Air Pollution Laboratory and authoritative institutions in the world. With connection to the Environmental Chamber, the VOCs compounds can be measured directly for emission measurements of indoor air studies or stimulation of photochemical smog formation studies.

Indoor Air Quality (IAQ) Study

Dust-Trak monitor, Q-Trak monitor for measuring CO, CO2, Temperature and Relative Humidity, Velocity Meter, TVOC PID monitor for detecting organic vapors in the hazardous or industrial environments, Radon Monitor, Formaldehyde Monitor and Bacteria Sampler are frequently utilized for conducting IAQ research.

Air Pollution Laboratory



Research Student operating the GC/MSD/FID/ECD System

Indoor Air Monitoring Equipment

Hydraulics Laboratory & Eco-hydraulics Research Center

This hydraulics laboratory mainly focuses in the teaching and research areas of hydraulic engineering and related disciplines, including: numerical and physical modeling of tidal circulation, wave propagation, storm surge, conduit flow, multi-phase flow, solute and sediment transport.

These facilities form as key tools and components of education and training for Undergraduates, Postgraduates, and PhD students in Civil Engineering & Environmental Engineering.

Recent research studies and projects mainly include: (i) Smart Urban Water & Hydro-environment Systems, (ii) Eco-hydraulic & Eco-hydrological Flow Channels, (iii) Resilient Coastal Water, (iv) Ocean Renewables (Hybrid Renewable Energy), and (v) Microfluidics & Microplastics.

Hydraulics Laboratory & Eco-hydraulics Research Center

Structural Engineering Research Laboratory

The Structural Engineering Research Laboratory is one of the largest laboratories in the Department of Civil and Environmental Engineering. The 178m^2 laboratory could perform large-scale testing. Our 1000-tons multi-purpose testing machine and four 100-tons loading frames are for static and dynamic testing of a wide range of heavy structural tests. Control and data acquisition are performed by fully computerized systems. Installed with state-of-the-art equipment, the laboratory has a leading position in advanced structural research, consultancy and educational services in the Pearl River Delta region.

Our recent research studies and consultancies include loading tests on cold-formed high strength steel, reinforced concrete columns, beam-column joints, concrete filled steel columns and brick walls.

The laboratory has facilitated field work in full-scale loading tests of semi-precast slabs, dynamic tests of bridge decks, damage detection of bridges, cyclic fatigue tests of carriageway overlay, dynamic loading tests of floor slabs, vibration measurements on buildings, etc.

The Structural Engineering Research Laboratory

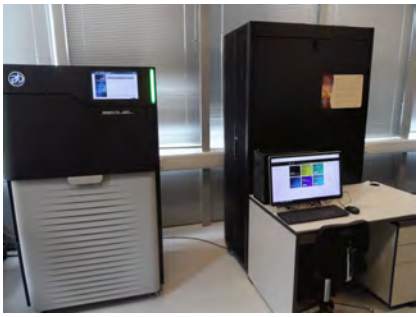
Water and Waste Laboratories

The Water and Waste Laboratories were established in 1976 to facilitate teaching, application and research in environmental engineering and sciences. The group of laboratories includes a teaching laboratory, four research laboratories, a chemical store, a sample storage cold room, and an instrumental laboratory for complete physical, chemical and biological sample characterization.

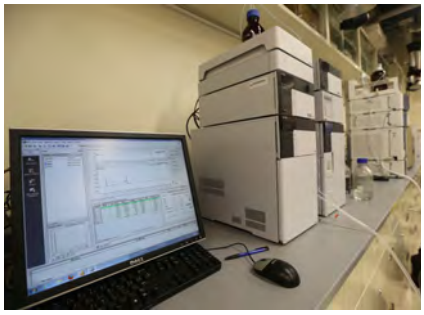
The Water Analysis Laboratory supports the application research of environmental engineering and sciences in the department. Divided in two areas, the main area is reserved for organic characterization while the ICP Room is specifically for the trace analysis of metal species in environmental samples.

The Advanced Environmental Laboratories are the latest addition to the group which comprise three research laboratories. Laboratory for Advanced Environmental Studies hosts two advanced research instruments for UCEA in the area of Metagenomics and Isotope Analysis. Advanced Environmental Microbiology Laboratory provide the necessary facilities for genomic sample preparations that supports biosafety level II microbiology test environment. Bioenergy Research Laboratory is dedicated to the development of biofuel and nano-catalytic research.

The Water and Waste Laboratories are partners of the State Key Laboratory in Marine Pollution under the Ministry of Science and Technology (Mainland China) and the Innovation Technology Commission (Hong Kong) Joint Laboratory Scheme.



3rd Generation DNA Sequencer for Metagenomic Studies



High-Performance Liquid Chromatography

Water and Waste Teaching Laboratory

Research Student operating Ultra-Performance Liquid Chromatography

Hydrographic Survey Laboratory

The Hydrographic Survey Laboratory ('Hydro Laboratory') at the Department of Land Surveying and Geo-Informatics has evolved into a modern laboratory with a suite of advanced instruments and software to meet the various university teaching, research and consulting requirements. These include HyPack software package, current meter, DGPS/Beacon single-frequency GPS receiver, digital tide gauge, dual-frequency Precise Point Positioning (PPP) GPS receiver, dual-frequency RTK/DGPS GPS receiver, Elac Console multi-beam echo sounder, motion reference unit, portable sound velocity profiler for depth and single-beam echo sounder.

Navigation Laboratory

The Navigation Laboratory is equipped with modern positioning equipment, such as GNSS receivers, INS, an optical motion tracking system and indoor positioning facilities. It has a platform for GNSS RTK service and generates real-time GNSS-related products, that is, water vapour content and ionosphere TEC distribution. The main research directions include GNSS theory and applications in positioning and environment monitoring, technologies for establishing urban positioning infrastructure, integrated navigation systems, Intelligent Transportation Systems (ITS) and Location-Based services (LBS).

Underground Utility Survey Laboratory

The Underground Utility Survey Lab in LSGI has been in operation since July 2014. Occupying a floor area of 73.3 m^2, it has scale-down networks and matrix consisting of metallic & non-metallic fresh & salt water supply pipes, drainage & sewerage pipes connected with manholes, power cables and gas cables, and valve chambers of various kinds embedded in a big tank. These networks of underground utilities and the back-filled soil serve as a scale-down model comparable to actual field conditions. The lab provides an indoor and controllable environment where orientations, depths, sizes, material types, coordinates of various utilities networks are carefully designed and recorded. All these attributes are geo-referenced and integrated into a geographic information system. The surveys are conducted by a range of utility survey/near-surface geophysical equipment, such as ground penetrating radar, electromagnetic pipe cable locator, acoustic leak noise correlator, infrared thermography, etc.

ACADEMIC STAFF

Department of Building Environment and Energy Engineering

Prof. Asif Sohail USMANI

Chair Professor of Building Sciences and Fire Safety Engineering
Head of Department
BE, MS, PhD, CEng, FIStructE

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Teaching Areas
Numerical Methods and Computing, Finite Element Methods, Nonlinear Structural Analysis, Fire Resistance of Structures, Fire Safety Engineering

Research Interests
Development of Computational Tools for Integrated Simulation of Structures subjected to Fire based on Open-source Software Framework OpenSees, Development and Characterisation of Realistic Fire Loading Scenarios for Performance Based Structural Engineering for Fire Resistance within a Probabilistic Framework, Progressive Collapse Simulation of Tall Building Under Multiple-floor Fires, Simulation of Structural Responses under Multi-Hazard Scenarios, e.g. fire following an earthquake, Load-induced Thermal Strain in Concrete Structures subjected to fire, Stainless Steel Structures in Fire, Cementitious Fire Protection Damage and Estimation of Reduced Fire Resistance in Steel Framed Structures, Development of Closed-form Solutions for the Thermo-Mechanical Response of Plate and Shells under Non-uniform and Transient Thermal Loading, Hybrid Simulation/Testing of Structures subjected to Loading and High Temperatures; and Real-time Emergency Response Systems in Buildings in the Context of Smart Cities

Biography
Professor Usmani joined The Hong Kong Polytechnic University in August 2016. He was the Head of Civil Engineering at Brunel University London and before that the Head of the Research Institute for Infrastructure and Environment and Professor of Structural Engineering and Computational Mechanics at the University of Edinburgh (until September 2015).

Prof. CHAO Yu Hang Christopher
趙汝恒 教授

Chair Professor of Thermal and Environmental Engineering and Director of Policy Research Centre for Innovation and Technology (PReCIT)
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Research Interests
Aerosol and Gaseous Contaminant Transport in Indoor Environments, Solar and Waste Heat Driven Cooling and Refrigeration System, Passive Radiative Cooling, Nanofluid Heat Transfer, Bio Inspired Heat Transfer, Fire Dynamics and Combustion, Innovation and Technology Policy, and Carbon Neutrality

Biography
Professor Christopher Chao received his BSc(Eng) degree in Mechanical Engineering (First Class) from The University of Hong Kong (HKU) in 1988. He was awarded the Sir Edward Youde Memorial Fellowship for Overseas Studies in 1990 and obtained his MSc and PhD degrees in Mechanical Engineering from The University of California at Berkeley in 1992 and 1994, respectively. Professor Chao was an Assistant Professor at the Hong Kong Polytechnic University (PolyU) from 1995-1997. Before returning to PolyU in September 2021, he was at The Hong Kong University of Science and Technology (HKUST), where he was Associate Dean of Engineering (Research and Graduate Studies) (2011-2014) and Head of Mechanical and Aerospace Engineering (2014-2018). He joined HKU to serve as Dean of Engineering and Chair Professor of Mechanical Engineering from 2018 to 2021. Professor Chao was ranked by Clarivate Analytics in the top 1% worldwide by citations in the research field of Engineering in 2020 to 2022, and Elsevier BV and Stanford University among the world's top 2% most-cited scientists in the field of Built Environment and Design for career-long citation impact in 2021 and 2022. He has published over 190 archival journal papers. He serves as editor and is on the editorial boards of several major journals in the field of Energy and Built Environment, including Energy and Buildings, Building and Environment, Indoor Air, Buildings, Building Simulation, Indoor and Built Environment, Heat Transfer, etc. He is a Fellow of the Hong Kong Academy of Engineering Sciences, American Society of Heating, Refrigerating and Air-Conditioning Engineers, American Society of Mechanical Engineers, Institution of Mechanical Engineers, Chartered Institution of Building Services Engineers, Hong Kong Institution of Engineers and International Society of Indoor Air Quality and Climate. He serves in various Government units and core I&T organizations, including the Steering Committee of the New Energy Transport Fund and Gas Safety Advisory Committee of the Hong Kong Environment Bureau, the Building Committee of the Housing Authority, the Sir Edward Youde Memorial Fund Council, Board of Directors of the Hong Kong Applied Science and Technology Research Institute, Board of Directors of Cyberport, Board of Directors of the Engineering forum of HKIE, HKIE Accreditation Board, Council of the Hong Kong Academy of Engineering Sciences and Council of Hong Kong Institution of Science. He is currently an Elected Ordinary Member of HKIE and also on the Executive Committee.

Prof. CHEN Qingyan
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BEng, MEng, PhD

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Research Interests
Computer Simulations and Experimental Measurements of Built Environment, Energy-Efficient, Healthy, and Sustainable Buildings

Biography
Professor Qingyan "Yan" Chen earned his BEng from Tsinghua University and MEng and PhD from the Delft University of Technology. He worked as a research scientist at ETH-Zurich, a project manager for TNO, and Assistant and Associate Professor at MIT. Before he joined PolyU, he was James G. Dwyer Professor of Mechanical Engineering at Purdue University. He is also the editor-in-chief of Building and Environment. Professor Chen's current research topics include indoor environment, aircraft cabin environment, and energy-efficient, healthy, and sustainable building design and analysis. He has published three books, six papers in book chapters, and over 470 journal and conference papers, and has been invited to deliver more than 180 lectures internationally. Professor Chen received several Distinguished and Exceptional Service Awards from the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE) and a CAREER award from the National Science Foundation in the United States. He has also received the Willis J. Whitfield Award from the Institute of Environmental Sciences and Technology, John Rydberg Gold Medal from the Scandinavian Federation of Heating, Ventilating and Sanitary Engineering Associations (SCANVAC), and Distinguished Achievement Award from the International Building Performance Simulation Association (IBPSA). He was an honorable member of the Society of Heating, Air-conditioning and Sanitary Engineers of Japan (SHASE). Professor Chen is a fellow of the ASHRAE, the International Society of Indoor Air Quality (ISIAQ), and the International Association of Advanced Materials (IAAM).

Prof. NIU Jianlei
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Associate Director of Otto Poon Charitable Foundation Smart Cities Research Institute
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Teaching Areas
Thermofluids, Heat Transfer, Air-Conditioning System Design and Analysis, Indoor Air Quality Engineering

Research Interests
Building Thermal System Modelling and Simulation Analysis, Turbulence Modelling and Computational Fluid Dynamics (CFD) Application, Experimental and Questionnaire Survey Design Methods

Biography
Professor Niu received his BSc in HVAC Engineering and MSc in Thermal Engineering from Tsinghua University, and PhD in Mechanical Engineering from Delft University of Technology, The Netherlands. He started his academic career at Tsinghua University, and also had industrial R&D exposure in China and UK in the 1980s. His research interests are computational fluid dynamics and thermal simulation, addressing real-world problems in indoor air quality, infection control in built environments, building energy use, and more recently in urban thermal comfort. Since joining PolyU, he has won an impressive number of competitive grants such as RGC/GRF and CRF, ITF, and RFCID/ HMRF, producing more than 200 publications. He has successfully supervised nearly 20 PhD students and post-doctoral fellows. A recipient of numerous awards, he was conferred fellowships from ASHRAE, CIBSE, HKIE, IBPSA and ISIAQ, and awarded ASHRAE Distinguished Lecturer 2009-2013, enabling him to give invited lectures worldwide. He serves as an RGC Engineering Panel member and co-editor-in-chief of the Elsevier journal Energy and Buildings. He served as vice-president of Indoor Air 2014, the flagship conference of ISIAQ. He is a founding member of IBPSA-China.

Prof. WANG Shengwei
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Teaching Areas
Intelligent Building, Building Automation and Control, Air-conditioning and Energy Efficiency

Research Interests
Building Energy and Automation: Optimal Design, Optimal Control, Energy-Flexible & Grid-Response Buildings, IoT and Distributed Intelligence in Buildings, Fault Diagnosis & Commissioning, Cleanroom and Data Centre Air-Conditioning Systems, District Cooling and District Energy Systems

Biography
Professor Wang obtained his BEng and MSc from Huazhong University of Science and Technology (HUST) in 1983 and 1986 respectively, and his PhD from University of Liege in 1993. He joined PolyU in 1993 as Assistant Professor and was promoted to Associate Professor in 2000, to Professor in 2005 and to the Chair Professor in 2008. He is a Fellow of the International Building Performance Simulation Association (IBPSA), a Fellow of the Chartered Institution of Building Services Engineers (CIBSE), and a Fellow of The Hong Kong Institution of Engineers (HKIE). He is one of most active scholars internationally in building energy and automation. He obtained over 50 research and development funds, including one Collaborative Research Grant(CRF) and 18 general research funds (GRF) from the Hong Kong Research Grants Council (RGC) and an Overseas Youth Talent cooperation grant of the National Science Foundation of China (NSFC). He has published over 350 papers in refereed journals (including over 270 paper in journals cited by SCI). He was also one of the top 150 highly-cited scholars in "Energy Science and Engineering" (2016) and ranked 20nd amongst 30,244 researchers worldwide in the discipline of Building and Construction (2021). He is also very active and successful in integrating academic research with industrial applications. He received over HKD 30 million from industry for applied research and applications. He participated in a large number of energy saving and optimization projects for commercial and industrial buildings, including large landmark building such as International Commerce Centre (ICC), which achieved energy savings of 15%-42% and maximum annual energy saving of over ten million kWh per individual building.

Prof. YAN Jinyue Jerry
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Teaching Areas
Sustainable Energy Systems, CO2 Capture and Storage (CCS), Advanced Thermodynamics

Research Interests
Advanced Energy Systems; Renewable Energy; Climate Change Mitigation Technologies and Related Environment and Policy

Biography
Professor Yan's research interests include advanced energy systems; renewable energy; climate change mitigation technologies and related environment and policy etc. Professor Yan is an active member (academician) of European Academy of Sciences and Arts and an ISI Highly Cited Researcher with about 400+ papers including papers featured in the top journals in Science, Nature Energy, Nature Climate & Nature Communications, as well as holds 10+ patents, with an H-index of 74, and an i10-index of 315 (Google Scholar). He has supervised about 200 postdocs and 50 PhDs. For the past 10 years, he has, as PC/PI/Co-PI, received external grants from research foundations and industries in several EU Projects (e.g., FP5, FP6, FP7, and Horizon), as well as other international and national projects with €20+ Million. He has founded and led the R&D platform of Future Energy Profile (ca. €10M) from the Swedish Knowledge Foundation and industrial partners (incl. ABB etc.). As a coordinator and founder, Prof. Yan has established several international and inter-disciplinary R&D platforms, such as international virtual collaboration Labs (UNiLAB), international clean energy talent program in clean energy (iCET), conference publication collection (Energy Proceedings), and energy preprint platform (EnerarXiv) etc. More than 10 UNiLABs have been initiated on challenging key topics in the area of energy involving more than 60 world leading partners (MIT, Harvard, Berkeley, Caltech, Oxford, Cambridge, etc.). He received many awards, such as Global Human Settlements Award of Green Technology (2014) supported by UNDP etc.; Finalist for SWFF (Securing Water for Food: A Grand Challenge for Development) award by USAID, Gov. of Sweden & the Netherlands (2015); The fellow scholarships of Royal Academy of Engineering Sciences (IVA), Sweden; European Union Energy Islands' Award (2017); and Research2Business Top100 Award by the IVA (2020).

Department of Building Environment and Energy Engineering

Prof. CHOW Wan Ki, JP
周允基 教授 太平紳士
Emeritus Professor of Architectural Science and Fire Engineering
BSc, MST, PhD, CEng, FCIBSE, FHKIE, FSFPE, FHKEng, FASME, CPEng, MIE(Aust), MACS, MASHRAE, MIFireE

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Biography
Professor Chow is the Emeritus Professor of Architectural Science and Fire Engineering, Department of Building Environment and Energy Engineering of The Hong Kong Polytechnic University. He graduated from the University of Hong Kong with a first class honours BSc degree in 1977; and from Portland State University, Portland, Oregon, U.S.A. with a MSc degree in teaching in 1979. He obtained his PhD degree in Computing Physics from the University of Hong Kong in 1983. Professor Chow joined the Department of Building and Surveying/ Building Services Engineering of the former Hong Kong Polytechnic in 1981 as an assistant lecturer, was promoted to Principal Lecturer in 1989, Reader/Professor in 2004, Chair of Building Services Engineering in 1998, which was retitled to Chair Professor of Architectural Science and Fire Engineering later in that year. He has contributed to a safe, comfortable and healthy environment for tall, sustainable buildings with large space volume and located deep underground through research, university teaching, assisting the government to approve fire safety design in new big construction projects and high-level consultancy projects, and service to professional institutions. He graduated one of the first cohorts of MPhil research students of the Polytechnic in 1989, the first cohort of PhD research students in 1991, and successfully supervised over 60 PhD students, with 30 at PolyU. He was elected a Fellow of the Hong Kong Academy of Engineering Sciences in December 2012, and appointed a Justice of the Peace by the Chief Executive of the Hong Kong Special Administrative Region in 2013. He was awarded the Lifetime Contribution Award by the Asia-Oceania Association for Fire Science and Technology (AOAFST) in October 2015.

Prof. CHEN Mingli
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Teaching Areas
Electrical Technology, Power & Machines, Power Distributions

Research Interests
Lightning Physics and Protection, Electrical Services, Electromagnetic Compatibility

Biography
Professor Chen has a BSc (1985, Lanzhou U, China) in Theoretical Physics, MSc (1988, Chinese Academy of Sciences (CAS)) in Atmospheric Physics, and PhD (2000, Gifu U, Japan) in Electrical & Electronic Information Systems. Before joining the department in 2002, he was a researcher in the CAS and a visiting scholar in Gifu University of Japan. He is now in charge of teaching subjects in the area of electric services. His research interest is in the areas of lightning physics and protection, building electrical services, electromagnetic compatibility and power quality. He has been engaged in 40 more various research projects and published 180 more journal and conference papers. He is the recipient of a Science and Technology Progress Award from CAS in 1993 and from the Headquarters of the People's Liberation Army in 1995. He is also the recipient of a Best Presentation Award of the 6th Asia Lightning Protection Forum in 2009, and three Dean's Awards for Excellence in External Competitive Research Funding in 2011, 2014 and 2017, respectively.

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Teaching Areas
Electrical Services in Buildings

Research Interests
Electrical Power Distribution and Utilization, Power Quality Control, Lightning and Surge Protection, Electromagnetic Environment and Compatibility

Biography
Professor Du received his BSc degree from Shanghai Jiaotong University, and his PhD from the Department of Electrical Engineering, University of Southern California, USA. His research interests include power quality in power distribution systems, electromagnetic environment and compatibility, lightning and surge protection in buildings, railway systems and telecommunication systems. He has been awarded fourteen external research grants from the Research Grants Council and more than thirty grants from industry partners. Recently he established a China Southern Power Grid (CSG) – Hong Kong Polytechnic University (PolyU) Joint Institute for Green and Secure Power Grid, and has received an earmarked grant of RMB 30 million. He has made significant contributions in modelling various structural systems and simulating electromagnetic transient phenomena in different systems with FDTD and PEEC methods. He also developed the single-line transmission line theory, and a user-friendly PEEC-based electromagnetic transient simulation software package. The accumulated research funding exceeds HK$ 30 million. He has produced more than 250 publications. Currently he is leading a research team in a CSG Science & Technolgy project with the total grant of RMB 15.9 million. Professor Du is an active EMC consultant, and has completed more than 100 projects related to electrical systems in buildings, railway systems and telecommunications. He is a member of IET, and is a chartered engineer.

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Teaching Areas
Engineering Thermodynamics, Air-Conditioning and Refrigeration, Renewable Energy

Research Interests
Solar Energy Utilization, Sky Terrestrial Cooling, Offshore Wind Power, Energy Efficient Building Energy Technologies, Functional Materials for Building Envelopes

Biography
Ir Prof. Lu received her BEng and MEng in HVAC&R engineering and PhD in renewable energy. As a highly cited researcher by Clarivate Analytics in Engineering (2018) and a World's Top 2% Scientist by Stanford University in Energy, Ir Prof. Lu is an active researcher in building energy fields with high local and international impact in both academia and industry, and has published 5 books/handbook chapters and over 270 SCI-cited journal papers. She has been the recipient of many prestigious awards, such as the 2nd class innovation award of Ministry of Education of China 2019, 2012/2014/2019 PolyU FCE Dean's Award for Outstanding Achievement in Research Funding, 2019 PolyU FCE Dean's Award for Highly-cited Papers, 2018 highly cited researcher by Clarivate Analytics, the Faculty Awards for Excellent Performance/Achievement 2017/2018 (Research and Scholarly Activities), the 2017 Hong Kong Green Innovations Awards (HKGIA), TechConnect 2017 Global Innovation Award (USA), a Special Merit Award and a Gold Medal in 2017 from the 44th International Exhibition of Inventions of Geneva, Hong Kong Green Building Award 2014, a Silver Medal in 2012 from the 40th International Exhibition of Inventions of Geneva, etc. Currently, she is serving local industry and profession as chairman of the Energy Institute (Hong Kong Branch), President of CE100 Hong Kong and vice president of Solar Energy Society of Hong Kong. She is the Section Editor-in-Chief (Energy Sustainability) of International Journal of Sustainability and Associate Editor for Frontiers in Built Environment. She is also sitting on the Editorial Board of several prestigious journals, including the International Journal of Energy (IF 8.857), Energy and Built Environment, Energy Storage and Saving (ENSS) and Journal of Discovery Mechanical Engineering.

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Teaching Areas
Building Environment, Building Acoustics, Indoor Environmental Quality, Wind Engineering and Ventilation

Research Interests
Building Environment, Building Acoustics

Biography
Professor Mak is interested in building science and human interaction with indoor and outdoor environments. He has committed to research works for over 25 years and has produced over 300 peer reviewed publications. His extensive research experiences and commitment have led him to the successful procurement of RGC Collaboration Research Fund (CRF) 2014/15 under Group Research Proposals. He received the Dean's Award for Outstanding Achievement in Research Funding in 2016 and 2022. He has been serving as a member of the editorial board of several international journals for many years. He has served as Guest Editor of a Special Issue of Building and Environment on "Building Acoustics and Noise Control" in 2014/2015 and was invited write a review paper on building acoustics in the 50-year golden issue of BAE. He has joined the editorial advisory board of the journal from 2017 to 2023. He has been the associate editor from 2019 to 2020 and the editor of Building and Environment in 2021. He has become the Editorial Board Member of Scientific Reports, Nature Research (SCI 2021 Impact factor: 4.996) since 1 July 2021 and has become the Editorial Board Member (Section Board: Building Energy, Physics, Environment, and Systems) of Buildings, The International Council for Research and Innovation in Building and Construction (CIB)) (SCI 2021 Impactor factor: 3.324) since January 2023. With his dedication to quality teaching and teaching development, he received the Faculty (Individual) Awards for Outstanding Performance/Achievement in teaching 2004/2005. Besides, he has contributed to the community through his involvement in various professional institutions. He is a Fellow of the HKIE and was the former chairman of the Hong Kong Institute of Acoustics.

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Teaching Areas
Air Conditioning and Ventilation, Sustainable Built Environment, Building Technology, Architectural and Buildings, Building Services and Design Process, Building Environmental Performance, Design Operation and Management, Indoor Air Quality Engineering

Research Interests
Indoor Environmental Quality, Indoor Air Quality, Building Energy, Plumbing and Drainage

Biography
Professor Mui obtained his BEng (Hons, First Class) degree in Building Services Engineering (BSE) at The Hong Kong Polytechnic University. He finished his PhD in building environmental performance from the same department. He received his industrial training in building services designs and project management in a mechanical and electrical engineering consulting company. He joined PolyU in 2000. He directs the research of IAQ sampling protocol, guidelines and bioaerosols at the PolyU, and has published widely in this field. His main research interests are in indoor air quality impacts on health, performance and perceptions; ventilation, energy and thermal comfort; and indoor exposures to airborne infectious agents. He has strong collaboration internationally and with local agencies across his research interest areas, and has been greatly involved in the development of local IAQ and ventilation standards in Hong Kong. Professor Mui is also a member of a number of professional bodies worldwide, including the HKIE, CIBSE, ASHRAE, CEng and RPE.

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Teaching Areas
Heat Transfer, Thermodynamics, Air Conditioning, Building Automation

Research Interests
Optimal Control and Diagnosis of Building and Energy Systems, Big Data Analytics and AI for Smart Energy-Efficient and Resilient Buildings, Dynamic Modeling of Heat and Mass Transfer Processes in Building Energy Systems

Biography
Professor Xiao obtained her double Bachelor degrees in Heating, Ventilation and Air-Conditioning Engineering (major) and Marketing (minor) from Xi'an Jiao Tong University in 1998, her Master's degree in Refrigeration and Cryogenics Engineering from Shanghai Jiao Tong University in 2001, and her PhD in Building Services Engineering from the Hong Kong Polytechnic University (PolyU) in 2004. She worked in Ove Arup & Partners Hong Kong Ltd. from 2005 to 2006. She joined PolyU as a Lecturer in July 2006 and was promoted to Assistant Professor in September 2009, Associate Professor in July 2013 and Professor in July 2020. Professor Xiao has been doing innovative multidisciplinary research on smart, energy-efficient and resilient buildings. She is a pioneering and active researcher in big building data analysis and applications. She has published over 120 SCI journal papers and secured 24 competitive research grants as the PI or Co-PI. She has received numerous awards including 2018 Outstanding ICAE Paper Award, 2017 Annual Best Paper Award in Journal of Refrigeration, 2017 PolyU Distinguished Knowledge Transfer Awards, ASHRAE Technology Award 2014, Dean's Award for Outstanding Achievement in Research Funding 2013, 2011 Commissioning Project of the Year (Final three) in CIBSE Awards, etc. Professor Xiao sits on the editorial boards of international journals of Automation in Construction and Energy and AI. She is a committee member of the BS Division of HKIE.

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Teaching Areas
Thermodynamics, Fluid Mechanics, Applied Solar Energy in Buildings, Renewable Energy Applications, Advanced Energy Technologies and Analytics

Research Interests
Building-Integrated Photovoltaics (BIPV), Offshore Wind Power Generation, Hybrid Solar-Wind Power Generation, Indirect Evaporative Cooling for Air-conditioning and Ground Coupled Heat Pumps for Air-conditioning

Biography
Professor Yang earned his BEng and MEng from Tianjin University in 1982 and 1985 respectively and went on to complete his PhD at the University of Wales College of Cardiff in 1993. He has had a successful career in renewable energy research and development, having worked on projects across Chinese mainland, Britain, and Hong Kong, including geothermal energy, solar energy, and wind energy applications. Currently, he leads the Renewable Energy Research Group (RERG) in the Department of Building Environment and Energy Engineering. Professor Yang has an impressive publication record, with over 500 academic papers, including more than 310 SCI journal papers and 7 professional books published. His research has been widely recognized. From 2016 to 2020, he was listed as a "Highly Cited Researcher" in Engineering by Elsevier and was ranked 15th among the most-cited Chinese scientists in Mechanical and Aerospace Engineering. He was also recognized as a world top 2% scientist in 2022. He has won several competitive grants from local industry, local government, and central government. He has successfully supervised 31 PhD students and 12 postdoctoral fellows. In addition to his many accolades, Professor Yang has received numerous awards for his research deliveries, including the 2019 Outstanding Scientific Research Achievements Award from the Education Ministry of China (second category), and awards from Geneva Innovation Exhibitions. He currently serves as Senior Editor for the International Journal of Applied Energy and President of the Solar Energy Society of Hong Kong.

Department of Building Environment and Energy Engineering

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Teaching Areas
Sustainability, Construction Management, Benchmarking, Indoor Air Quality

Research Interests
Sustainability, Soundscape, Outdoor and Indoor Air Quality, Environmental Performance, Decision-Making Sciences, Engineering Economics, Cost Modelling, Econometrics

Biography
Dr Chau has a diversified academic background in quantity surveying, architecture, and mechanical engineering. He earned his Master's degrees in Architecture and Mechanical Engineering, and his PhD in Mechanical Engineering. His major research interests are the inter-relationships between the human and built environments, economic valuation and benchmarking of sustainable built environments, air quality and soundscape. He has also been actively involved in consultancy projects related to the costs and financial benefits of undertaking green building assessments, life cycle energy analysis of building construction, cost effectiveness study for noise barriers.

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Teaching Areas
Maintenance Management of Built Assets, Legal Aspects of Facility Management, Facility Management Professional Practice, Building Performance Diagnosis and Management, Facility Management and the Workplace, Design Project, Research Project, Operation and Maintenance, Testing and Commissioning

Research Interests
Design/Construction Management, Operation and Maintenance, Facilities Economics and Contracts, Performance Evaluation, Legal Issues of Built Facilities, Building Energy/Carbon, IoT and BIM

Biography
Dr Lai possesses a first-class honours degree in Building Services Engineering, a master's degree in Environmental Management and a PhD in Facilities Management. He is a registered professional engineer, with substantial practical experience in building services consultancy, property development and facilities management. A recipient of the Departmental Teaching Excellence Award, Faculty Teaching Excellence Award and Dean's Award for Outstanding Achievement in Academic Programme Development of PolyU, and the Distinguished Educator Award of the International Facility Management Association, Dr Lai was the programme leader of PolyU's MSc in Facility Management. He is co-editor of the Facilities journal and associate editor of the Smart and Sustainable Built Environment journal. Dr Lai has actively undertaken research studies, publishing widely in scholarly journals. Besides delivering training courses and consultancy services, Dr Lai has been on various committees of government/professional bodies and has served as chairman of programme validations, and external examiner of various programmes.

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Teaching Areas
Lighting Technology, Lighting Engineering

Research Interests
Color Science and Management, Imaging Science, Illuminating Engineering, Solid-State Lighting, Daylighting and Green Building

Biography
Dr Minchen Wei is the Director of Color, Imaging and Metaverse Research Center, the recipient of China's Excellent Young Scientists Fund. He obtained his Bachelor degree from Fudan University in 2009. In Aug 2011 and Dec 2015, he earned his Master of Science and PhD degrees in Architectural Engineering at The Pennsylvania State University. He joined PolyU in Oct 2015 as an Assistant Professor and was promoted to Associate Professor in 2020. His research mainly focuses on fundamental color science, color management and application for imaging and metaverse systems (e.g. display, camera, AR/VR/MR), and illuminating engineering. His work has been supported by the Research Grant Council (RGC) of Hong Kong, National Science Foundation of China (NSFC), Hong Kong Policy Innovation and Coordination Office, and Hong Kong SAR Electrical and Mechanical Services Department (EMSD), and various industry partners (i.e., Facebook, Google, Huawei, DJI, WSP, OPPO, OPPLE Lighting, etc). Dr Wei is currently the Vice Chairman of CIE (HK), and national representative in CIE Division 1 and 8. He is also an Associate Editor of Journal of the Optical Society of America A, and Color Research & Application. In 2021, he received a Google Research Scholar Award.

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Teaching Areas
Architecture and Building Ecology, Piped Services, Building System Performance, Sustainability and the Built Environment, Service Learning

Research Interests
Indoor Environmental Quality, Water Environment for Buildings

Biography
Dr L. T. Wong graduated from The Hong Kong Polytechnic University with a BEng(Hons, First Class) degree in Building Services Engineering in 1992 and a Ph.D. in 1997. He joined the then Department of Building Services Engineering in 1996. He serves the department as the Associate Head and the programme leader of BEng(Hons) in Building Science and Engineering (Formerly Building Services Engineering). Dr Wong received the Hans B. Thorelli Award of 2006 and in 2011 the highly commended award winner Awards for Excellence from the Emerald Literati Network. He is a working commission member (W062-water supply and drainage for buildings) of the Council for Research and Innovation in Building and Construction (CIB) and organized the 34th CIBW062 International Symposium on Water Supply and Drainage for Buildings in Hong Kong in 2008. He is a scholar ranked world's top 2% of scientists released by Stanford University in 2021 & 2022. He is the editor-in-chief of the journal AIR. He served Hong Kong Baptist University as a court member (2016-2021) and council member (2022-2023).

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Teaching Areas
Thermal Energy Engineering, Building Energy Technology, and Building Energy Simulation

Research Interests
Low-energy and Zero-energy Buildings, Advanced On-site Renewable Energy Systems, Building Integrated Energy Storage Solutions, HVAC Technologies, and the Integrations between Buildings, Hybrid Smart Grids and New Energy Vehicles

Biography
Dr Cao obtained his Doctor of Science (Technology) degree in April 2014 from the School of Engineering at Aalto University (formerly known as Helsinki University of Technology), Finland. His MSc degree was obtained in June 2010 from the University of Jyvaskyla, Finland, while his master's thesis project was conducted at the Norwegian University of Science and Technology (NTNU), Norway. Before joining PolyU in 2017, he was successively employed as a Research Assistant, Doctoral Researcher and Postdoctoral Researcher at Aalto University, Finland. Moreover, in January and February 2016, Dr Cao worked as a visiting scientist at the Fraunhofer Institute for Solar Energy Systems (ISE), Germany, for a joint research between Fraunhofer ISE and Aalto University. His main research expertise is in the fields of low-energy and zero-energy buildings, advanced on-site renewable energy systems, building integrated energy storage solutions, HVAC technologies, and the integrations between buildings, hybrid smart grids and new energy vehicles. He participated in the IEA SHC T44/HPP A38 and IEA EBC A67 as a Finland representative and observer, respectively. So far, he has published 57 scientific publications, including 43 high-IF (impact factor) international SCI journal papers.

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Teaching Areas
Facilities Management, Construction Management, Real Estate Management

Research Interests
Building-behaviour Research, Facilities Management, Workplace Management

Biography
Dr Cynthia Hou received her PhD in Real Estate and Construction from the University of Hong Kong and is a member of the Royal Institution of Chartered Surveyors. Before joining PolyU, she worked as an Assistant Professor in the Department of Management in the Built Environment, Delft University of Technology (2020-2021) and a Lecturer in the Chinese University of Hong Kong (2015-2020). She has been engaged in research in the field of built environment management. Her research focuses include post-occupancy evaluation, workplace management, strategic facilities management, and heritage management. Recently, she has leveraged smart technologies in her research by investigating smart hotels, smart heritage facilities management, and virtual reality (VR) technologies applications in built environment education. She seeks to investigate efficient and sustainable built environment management strategies from a facilities management perspective. She is also keen to adopt digital approaches in her research, with an aim to delineating the dynamics among people, facilities and space in the built environment and exploring data-driven solutions for facilities management problems in society.

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Teaching Areas
Fire Science and Fire Protection Engineering; Fire Services; Fire Dynamics; Computational Fire Modelling; Research Methods

Research Interests
Fire Engineering, Combustion, Wildland Fires, Energy Safety, and Smart Firefighting

Biography
Dr Xinyan Huang is a combustion scientist and a fire safety engineer. He received his PhD from Imperial College London in 2016, MSc from University of California, San Diego in 2012, and BEng from Southeast University in 2010. Prior to joining PolyU, he was a Postdoctoral Fellow and Lecturer at the University of California at Berkeley and worked with NASA on Spacecraft Fire Safety. His research interests include fundamental combustion and applied fire technologies with over 150 journal papers. Dr Huang is an Associate Editor of Fire Technology and International Journal of Wildland Fire, an editorial member of Fire Safety J, a board member of International Association of Wildland Fire, a Chartered Engineer, a committee member for HK Fire Safety Code, and a Fire Expert for HK High Court. He is a winner of Bernard Lewis Fellowship and Sugden Best Paper Award from Combustion Institute, the Proulx Early Career Award from International Association for Fire Safety Science, Ricardo Award from Institute of Physics, Fire Engineering Grand Award from HKIE, "5 under 35" and Bono Award from the Society of Fire Protection Engineers.

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Teaching Areas
Fire Safety Engineering

Research Interests
Fire Behaviour, Structures in Fire, Timber Structure, Hybrid Test

Biography
Dr Jiang Liming joined the Department of BEEE as an Assistant Professor in September 2019. He obtained his PhD degree from Edinburgh University in UK and before that he was in Tongji University for his undergraduate and post-graduate studies in the college of Civil Engineering. Dr Jiang started his research in structural fire safety engineering from 2008 working on fire proof coating material and he was further trained at the BRE Centre for Fire Safety Engineering during his PhD study. Following a short period of post-doctorate research career in Brunel and PolyU, he joined the Country Garden Group (Top Real-estate Developer) in 2018 and was quickly promoted to the Project General Manager in 2019. Then he returned to PolyU in September 2019 and became an Assistant Professor in the Department of BEEE. His research interests include fire behaviour in modern buildings, fire safety engineering measures, timber structures, computational modelling, and hybrid testing. He is the leader of structural fire research at the Research Center for Fire Safety Engineering and serves as a reviewer for multiple international journals and guest editor of special issue. He is a member of SFPE and the professional committee of structural fire resistance of the architectural society of China.

Department of Building Environment and Energy Engineering

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Teaching Areas
Air-Conditioning, Building Services Commissioning and Computational Fluid Dynamics

Research Interests
Computational Fluid Dynamics, Indoor Air Quality, Healthy Buildings

Biography
Dr Ruoyu You received her B.Eng. degree from the Department of Building Science at Tsinghua University in 2013. She received her Ph.D. degree from the School of Mechanical Engineering at Purdue University in 2018. Dr You joined the then Department of Building Services Engineering at the Hong Kong Polytechnic University as an Assistant Professor in September, 2018. Her research interests include air quality in enclosed environments, computational fluid dynamics, contaminant transport, and laser-based sensors for indoor air quality. Dr You has secured multiple research funding, such as the Early Career Scheme and the General Research Fund from the Hong Kong Research Grant Council. She is a co-Principal Investigator of large projects funded by the high impact Theme-based Research Scheme and Young Collaborative Research Grant.

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Teaching Areas
Building Energy Simulation, Facility Management, Research Project

Research Interests
Solar and Waste Heat Driven Cooling and Refrigeration System, Passive Radiative Cooling, Nanofluid Heat Transfer, Bio Inspired Heat Transfer, Building Energy Management

Biography
Dr Oscar K.C. Chan received his BEng, MPhil, and PhD degrees in Mechanical Engineering from The Hong Kong University of Science and Technology (HKUST) in 2009, 2011 and 2015. His research area includes energy and thermal systems, adsorption technology, energy sustainability and thermal fluidic simulation. After graduation, he was appointed as Research Assistant Professor in HKUST Fok Ying Tung Graduate School and engaged in postdoctoral research at the postdoctoral workstation of Nansha Information Technology Park, Guangzhou in 2016. The postdoctoral research mission was completed in 2019. He was elected to Young Overseas Talents Introduction Plan of the Pearl River Talent Program in 2016. He received a postdoctoral research fund in 2016, School of Engineering (SENG) PhD Fellowship Award in 2014, Hong Kong PhD Fellowship in 2011, The Hong Kong Institution of Engineers (Fire Division) Scholarship in 2010 and HKUST Academic Achievement Medal in 2009.

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Teaching Areas
Environmental Economics and Policy, Applied Solar Energy in Buildings

Research Interests
Acoustics, Thermofluids, Aerosol, Indoor Air Quality and Energy Efficient Building

Biography
Dr Sau-chung Fu received his BEng and MPhil in Mechanical Engineering from the University of Hong Kong in 1999 and 2001 respectively. After having practiced for some years in an engineering consultant, he went on pursuing a PhD degree in Mechanical Engineering at the Hong Kong Polytechnic University in 2011. He was a Research Associate in the Hong Kong University of Science and Technology, a Postdoctoral Fellow and a Research Assistant Professor in the HKUST Fok Ying Tung Graduate School, and a Research Assistant Professor in the Department of Mechanical Engineering, HKU, before coming back to PolyU. Dr Fu's research focused on acoustics, thermofluids, aerosol, indoor air quality and energy efficient building, using numerical simulations as well as advanced experimental techniques.

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Teaching Areas
Building Carbon Footprint, Building Information Modelling

Research Interests
Zero/Low Energy Buildings, Uncertainty-based Optimal Design, Optimal Control of Building Energy Systems, Building Demand Response

Biography
Dr Li obtained her Bachelor's degree and Master's degree in Heating, Ventilation and Air Conditioning (HVAC) Engineering from Hunan University in 2012 and 2015 respectively. Her PhD degree was obtained in 2020 from the then Department of Building Services Engineering at the Hong Kong Polytechnic University. Dr Li joined PolyU as a Research Assistant Professor in March 2020. Her research expertise is mainly in the fields of zero/low energy buildings, uncertainty-based optimal design, optimal control of building energy systems, adaptive commissioning of building energy systems, and building demand response.

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Teaching Areas
Building Informatics

Research Interests
Edge Computing and Edge AI, Artificial Intelligence of Things, Smart Buildings, Wireless Sensor Networks

Biography
Dr Yuvraj Sahni received the B.E. (Hons) degree in Electrical and Electronics Engineering from Birla Institute of Technology and Science, Pilani, India, in 2015 and the PhD degree from the Department of Computing, The Hong Kong Polytechnic University, Hong Kong, in 2021. He is currently a Research Assistant Professor at the Department of Building Environment and Energy Engineering, The Hong Kong Polytechnic University, Hong Kong. Before that, he was a Postdoctoral Fellow at the Department of Computing, The Hong Kong Polytechnic University from April 2021 to March 2022. His research interests include Edge Computing and Edge AI, Artificial Intelligence of Things, Smart Buildings, and Wireless Sensor Networks.

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Teaching Areas
Building Automation and Control; Engineering Thermodynamics.

Research Interests
Adaptive and Fault Tolerant Optimal Online Control of Large and Complex HVAC Systems; Demand Limiting and Demand Response Control of Building Energy Systems; Smart Metering and IoT Technologies for Buildings; Design, Control of Building Energy Systems Considering Uncertainties; Building Energy Performance Assessment; Optimal Design and Control of Cleanroom Energy Systems

Biography
Dr Shan received his BSc in 2005 and MSc in 2008 at Southeast University, China. He obtained his PhD in 2013 at The Hong Kong Polytechnic University. He has been conducting research and practical projects in PolyU since 2010. He has published over 30 SCI journal papers in his research fields. He is a Research Assistant Professor in the Research Institute for Smart Energy and the Dept. of Building Environment and Energy Engineering. He has industrial R&D exposure in mainland China and Hong Kong. He used to work as a project engineer in Emerson Climate Technologies Suzhou R&D Center for two years and developed several refrigeration systems. His practical project experiences in building energy systems include the development of a toolbox of intelligent optimal control strategies, and management of the energy-saving projects for International Commerce Center (ICC), pharmaceutical factories, campus buildings in PolyU, MTR stations, New World Centre etc.

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Teaching Areas
Industrial Release, Fire and Explosion Modeling

Research Interests
Natural Gas and Hydrogen, Automated Leakage Detection, Real-time Dispersion and Explosion Modeling, Openfoam, Physics-guided Machine/Deep Learning, Digital Twin of Fire and Explosion Accidental Emergency Management

Biography
Dr Shi received his BEng (First Class) degree and PhD degree from China University of Petroleum in 2013, and 2018, respectively. Dr Shi was also a China Scholarship Council (CSC) visiting PhD student of Curtin University in Australia from 2016 to 2018. Before joining PolyU, he worked as an Associate Professor and Postdoctoral Researcher at China University of Petroleum. Dr Shi's research interests focus on automated natural gas and hydrogen leakage detection, real-time dispersion and explosion modeling, physics-guided machine/deep learnings, digital twin of fire and explosion accidental emergency management. Based on these research topics, Dr Shi has published 35 SCI journal papers including 20 papers as the first/corresponding author. His works were funded by National Key R&D Program of China, NSFC and various industrial partners etc. Dr Shi also serves as a Guest Editor of Process Safety and Environmental Protection. He is also a winner of the Best PhD Thesis of Safety Science and Engineering in China.

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Research Interests
Indoor and Outdoor Thermal Comfort, Improvement Strategies for Outdoor Microclimate, Thermal Comfort Models for Urban Thermal Environment, Thermal Comfort and Human Behavior

Biography
Dr Yongxin Xie is currently a Research Assistant Professor in the Department of Building Environment and Energy Engineering at PolyU. She received her BEng degree from the South China University of Technology in 2013, MPhil degree from the Hong Kong University of Science and Technology in 2015 and PhD from the HKPolyU in 2020. Her postdoctoral research was conducted at Tsinghua University under the 'Shuimu Scholar Programme' in 2020. Then in 2022, she returned to PolyU as a Research Assistant Professor. The focus of her research is on indoor and outdoor thermal environments and thermal comfort. This includes thermal comfort models for urban thermal environment, improvement strategies for outdoor microclimate, and thermal comfort and human behavior.

Department of
Building Environment and Energy Engineering

Dr YANG Zili
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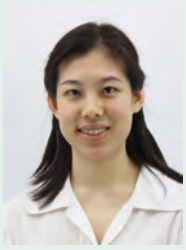
Teaching Areas
Air-Conditioning System, Refrigeration Technology for HVAC, Building Environment, Gas Supply

Research Interests
Indoor Thermal and Humid Environment; Bioaerosol and Air Disinfection; Smart Indoor Finishing Materials

Biography
Dr Yang received his BSc in HVAC Engineering from Xi'an Jiaotong University (Outstanding Graduate Award) in 2011 and PhD in Civil Engineering from Shanghai Jiao Tong University (Outstanding Graduate Award) in 2017, China. He started his academic career at Donghua University, Shanghai, since 2017 where he was an Associate Professor and has supervised over 10 Master students before joining PolyU. His research interests are indoor thermal and humid environment, humidity and mold control, addressing the high energy consumption for dehumidification and mold aerosol pollution in indoor air. He has won some competitive grants, such as NSFC and China Postdoc Grant (First-class), Research Grant from Shanghai Government. He is an active member in the field of indoor air quality and have published more than 30 papers.



Dr YU Yichen
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Research Interests
Outdoor Thermal Comfort, Urban Pedestrian Level Wind, Convective Heat Transfer, Thermal Manikin and Wind Tunnel Experiments

Biography
Dr Yichen Yu received her BSc in Building Environment and Energy Engineering from Central South University, and PhD in Architecture Science and Design from the University of Sydney. Before joining PolyU in 2022, she worked as a Research Associate at UNSW Built Environment. Yichen's research efforts are directed towards outdoor thermal comfort, with a particular interest in the role of wind. Her research mainly focused on two streams a) pedestrian level urban wind environment measurements and parameterizations, b) the effect of wind and turbulence on thermal comfort. Her research outcomes have been published in top ranking journals, including Building and Environment, sustainable cities and society, and wind engineering and industrial aerodynamics.

Department of Building and Real Estate

Prof. YAM Chi Ho Michael
任志浩 教授
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Teaching Areas
Structural Analysis and Design, Geotechnical and Foundation Engineering

Research Interests
Structural Steel Design, Connections, Structural Rehabilitation, Structural Application of Shape Memory Alloys, Full-Scale Testing of Structural Members, Construction Safety

Biography
Prof. Yam received his BSc degree in Civil Engineering with Distinction from the University of Alberta, Canada and subsequently completed his MSc and PhD degrees in Civil Engineering at the same University. Prior to joining PolyU in 2002, Prof. Yam was involved in the design of high-rise buildings in an international consulting company in Hong Kong. He was also an Assistant Professor of civil engineering at the University of Macau from 1995 to 1998. Currently, he is a Professor in the Department of Building and Real Estate at PolyU. He has over 25 years of experience in teaching and researching structural engineering, with a focus on the experimental and numerical investigation of steel members and connections, application of smart materials in steel connections and seismic resilience of steel structures. Prof. Yam has over 200 publications, including refereed journal and conference papers, research monographs, research reports and design guide. Prof. Yam was appointed Deputy Director and Executive Secretary of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) in 2015. He is also the Vice President of the Hong Kong Constructional Metal Structures Association and the Deputy Chairman of the Building Discipline Advisory Panel of the Hong Kong Institution of Engineers. Prof. Yam is a fellow of the American Society of Civil Engineers, The Hong Kong Institution of Engineers and The Hong Kong Institute of Construction Managers.

Prof. SHEN Qiping Geoffrey
沈岐平 教授
Chair Professor of Construction Management
Associate Vice President (Global Partnerships)
Director of Global Engagement
BEng (Tsinghua), PhD (Salford), FRICS, FHKIVM, VMF (List A)

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Teaching Areas
Value Management in Construction, Construction Project Management, Research and Consultancy Techniques

Research Interests
Value Management, Sustainable Construction, Partnering, Construction Industrialisation

Biography
Prof. Shen has a proven track record of academic and research leadership in construction management with special interests in sustainable construction, value management and collaborative working supported by information and communication technologies. He has led a large number of research projects with total funding over HK$50 million, including five RGC-CERG grants in a row and has authored more than 400 publications, including 200+ papers in academic and professional refereed journals. He is a member of the editorial boards of several leading journals, and has been invited to give keynote presentations in a number of international conferences. He served on the built environment panel of the Research Assessment Exercise in Hong Kong in 2006, and he is the Immediate Past Chair of the Global Leadership Forum in Construction Engineering and Management Programs. Professionally, he is an Eminent Fellow of the Royal Institution of Chartered Surveyors (RICS) and the Hong Kong Institute of Value Management (HKIVM). As a certified value management facilitator (List A) recognised by the HKSAR Government and a certified value specialist (CVS) of SAVE International, he has professionally designed and facilitated 50+ value management and partnering workshops for many client organisations in both the public and private sectors. He received the Presidential Citation Award from SAVE International in 2009 for his "energetic and engaging effort to enhance value research and education".

Prof. CHAN Ping Chuen Albert
陳炳泉 教授
Chair Professor of Construction Engineering and Management
Able Professor in Construction Health and Safety
Dean of Students
Associate Director of Research Institute for Sustainable Urban Development
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Teaching Areas
Project Management, International Construction Projects

Research Interests
Construction Engineering and Management, Construction Health and Safety, Public-Private-Partnership, Project Success

Biography
Professor Albert Chan is currently PolyU's Dean of Students, Associate Director of Research Institute for Sustainable Urban Development, Able Professor in Construction Health and Safety, and Chair Professor of Construction Engineering and Management. He earned his MSc degree in Construction Management and Economics from the University of Aston in Birmingham, and PhD degree in Project Management from the University of South Australia. Before joining the Department of Building and Real Estate of PolyU in 1996, Professor Chan taught at the University of South Australia as a Senior Lecturer and Deputy Head of the School of Building and Planning. He was appointed by PolyU as Associate Head (Teaching) of the Department of Building and Real Estate from 2005 to 2011, Associate Dean from 2011 to 2013, Interim Dean of the Faculty of Construction and Environment from 2013 to 2014, and Head of the Department of Building and Real Estate from 2015 to 2021. He has been an Adjunct Professor in a number of Mainland and overseas universities. A chartered construction manager, engineer, project manager and surveyor by profession, Professor Chan is devoted to a myriad of research subjects as varied as project management and project success, construction procurement and relational contracting, public private partnerships, and construction health and safety, as manifested by his prolific research output of over 1,000 refereed journal papers, international refereed conference papers, consultancy reports, and other articles. Besides being an expert member of the Engineering Panel of the Research Grants Council, HKSAR from 2015 to 2021, Professor Chan also served as an expert member in the Built Environment Panel of FORMAS, Swedish Research Grants Council, and the Faculty of Architectural and the Built Environment, Delft University of Technology in the Netherlands. Professor Chan was ranked among the Top 2% of Scientists in the World for three years in a row since 2020, according to a study by a group of scholars in Stanford University. He was ranked 23rd in the Subject Field of Building and Construction in the World in 2022.

Prof. LI Heng
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Teaching Areas
Construction Virtual Prototyping, Construction Information Technology, Construction Management, Construction Technology

Research Interests
Construction Virtual Prototyping Technology, Construction Management and Innovative Technology

Biography
Prof. Li has established an international reputation in the area of construction management research through developing innovative IT solutions to enhance project delivery processes. His recent research interest has been developing the construction virtual prototyping technology for contractors to identify construction problems and explore possible solutions and improvements to the construction plan before the actual work begins. His future research plan is to adapt the business model of IKEA furniture shops that seamlessly integrates design and on-site installation to further reduce the management costs of a construction project. He expects VP technology would provide a natural interface to all stages of a project lifecycle, and that the overall efficiency and effectiveness of the Hong Kong construction industry can be improved by the use of this technology.

Department of Building and Real Estate

Prof. Michael ANSON
安禮信 教授

Emeritus Professor
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Research Interests
Concrete Structures and Technology, Theories of Failure for Concrete, The Concrete Supply, Distribution and Placing Industry, Construction Site Management

Biography
As a former Head of the Department of Engineering at Lancaster University as well as the Department of Civil & Structural Engineering of the Hong Kong Polytechnic and the first Dean of the Faculty of Construction and Land Use at The Hong Kong Polytechnic University, Prof. Anson has made useful contributions to his field in the following areas: precise measurements of Poisson's ratio for concretes and mortars as affected by mix proportions (1965); implementation costs measured of the application of the critical path method in construction(1964-68); explanation of why site placed concrete was four times more likely to be pumped in Germany than in the UK (1984-6); precise measurements of early age tensile strains in concrete tanks under construction(1986-8); productivity of ready mixed concrete resources for a mostly rural part of the UK (1985-7); benchmarking concrete placing productivity on Hong Kong construction sites (1991-6); productivity of concrete supply resources in Hong Kong and measurement of the matching being achieved between concrete supply to sites and the requirements of those sites (1995-2001) and an explanation of that matching performance (2013-2016); enabling the Faculty's internationally recognized strengths in atmospheric chemistry and pollution studies (1992-2000).

Prof. HUI Chi Man Eddie
許智文 教授

Professor
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Teaching Areas
Housing Studies, Project Appraisal/Economic Analysis, Property Management, Real Estate Investment

Research Interests
Land and Construction Economics and Finance, Urban and Real Estate Economics

Biography
Prof. Hui is an all-round professional with diverse experiences in research and consultancy projects. Before joining PolyU, he was responsible for research and development for a major surveying firm in Hong Kong. At the University of Hong Kong, he obtained his BSc (first class honours). At the University of Cambridge, UK, he finished his MPhil in Land Economy (first class) with a Commonwealth Scholarship. With another Commonwealth Scholarship, he completed his PhD at the Department of Land Economy, University of Cambridge, UK, where he is currently an associate and a fellow of the Cambridge Commonwealth Trust. He is the editor-in-chief of Habitat International, and associate editor of both Journal of Urban Planning and Management, ASCE and International Journal of Strategic Property Management. In 2015, the Chief Executive awarded Prof. Hui in the year's Honours list. He was presented a Medal of Honour for his dedicated public service, particularly his contributions to the Town Planning Board and the surveying sector.

Prof. NI Meng
倪萌 教授

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Teaching Areas
Built Environment, Building Services, Numerical Methods, Advanced Energy Technologies, Research Methods

Research Interests
Fuel Cells; Batteries; Hydrogen Energy; Low Grade Heat Utilization; Numerical Heat Transfer

Biography
Prof. Ni received his PhD in Mechanical Engineering from The University of Hong Kong (HKU) in 2007. He worked as a Postdoctoral Fellow in HKU for 2 years and joined BRE as an Assistant Professor in July 2009. He was promoted to Associate Professor in July 2012 and Professor in July 2016. Prof. Ni focused his research on fuel cells and batteries and electrochemical systems for low grade heat utilization. His research has received funding support from the RGC (TRS, GRF, ECS, NSFC/RGC joint scheme, SFC/RGC joint scheme, and France/HK Joint Scheme), ECF and ITF. Prof. Ni has published over 200 papers in prestigious journals with over 10,000 SCI citations (web of science). He is a senior editor for Sustainable Energy Technologies and Assessments (Elsevier) and an associate editor for International Journal of Energy Research (Wiley) and International Journal of Green Energy (Taylor & Francis). He is an active reviewer for over 80 journals, including Science and Nature Communications. Prof. Ni has delivered 36 deliver keynote/invited lectures at different international conferences. He received the Young Scientist Award from the Hong Kong Institution of Science in 2007. In 2016, Prof. Ni was listed in the World's Highly Cited Researchers in Energy Science and Technology by ShanghaiRanking. Prof. Ni was awarded the prestigious Humboldt Fellowship in 2017. In 2016 and 2017, Prof. Ni received the Best Associate Editor Award from Science Bulletin. In a recent Stanford Study, Prof. Ni ranks within top 0.063% in the world in the subject field of Energy.

Prof. Tarek ZAYED

Professor
Associate Head (Research)
BSc, MSc, PhD, P.E., PEng, FASCE, FCSCE, FHKIE

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Teaching Areas
Construction Engineering and Management, Asset Management, Simulation in Construction, Sustainability Assessment and Implementation, Resilience of Infrastructure

Research Interests
Simulation and IT-Based Modeling, Productivity Assessment and Analysis of Construction Operations / Equipment, Construction, Infrastructure and Asset Management, Performance Assessment and Rehabilitation of Municipal Infrastructure Systems, Integrated Reliability and Risk Assessment, Client Driven Serviceability Assessment, Optimized Capital Investment Plan for Assets, Integrated Decision Support System, Sustainability of Educational Buildings, Construction Company Performance, Resilience Assessment for Infrastructure

Biography
Prof. Zayed has a PhD, MSc, and BSc in Construction Engineering and Management. He has 30 years of professional experience working in construction industry training and in academic posts in USA, Canada, Hong Kong, and abroad. Prof. Zayed conducted research on infrastructure management, simulation and artificial intelligent applications in construction, asset performance, scheduling, life cycle cost (LCC) analysis, budget allocation, and risk assessment for construction and rehabilitation of highways, oil and gas pipelines, water and sewer systems, and bridges. Recent developments include condition rating, deterioration, and LCC technology-based models for bridge deck; water, sewer, oil & gas pipelines; tunnels and metro stations; water / sewer treatment plant elements; and sustainability of buildings.

Department of Building and Real Estate

Dr CHAN Wai Ming Daniel
陳煒明 博士
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Teaching Areas
Construction Management, Project Management, Procurement Systems, Relational and Collaborative Contracting, Research Methods

Research Interests
Construction Time Performance, Construction Procurement Systems, Relational and Collaborative Contracting, New Engineering Contract (NEC), Public-Private Partnership (PPP), Construction Safety Management, Sustainability Performance Assessment Models for Green Building Projects, Building Information Modelling (BIM) Adoption in Construction Small and Medium-sized Enterprises (SMEs), Modular Integrated Construction (MiC) Method

Biography
Dr Chan obtained his BEng(Hons) degree in Civil and Structural Engineering and PhD degree in Construction Project Management from The University of Hong Kong. He is a Project Manager, Chartered Building Engineer (United Kingdom) and Registered Construction Manager (Hong Kong) by profession. He is currently an Associate Professor in Construction Project Management. He served as the Programme Award Coordinator for the MSc/PgD in Construction and Real Estate from January 2007 to June 2016. Then he was appointed as the Associate Head (Teaching) from July 2016 to June 2019 and re-appointed as the Associate Head (Teaching) on 1 July 2021 for another 3 years. Moreover, he has been serving as the Deputy Programme Director for the Professional Doctor of International Real Estate and Construction (DIREC) since 1 July 2020. He was the winner of the Departmental Award for Outstanding Teacher 2018-19 (Category: Individual Award) in recognition of his outstanding performance and achievement in teaching and learning related activities. He has co-authored 17 research monographs, 2 scholarly textbooks, 3 book chapters, 157 journal articles and 128 conference papers up to 31 October 2022. He was the Chairman of the CPD Committee of the Hong Kong Institute of Project Management (HKIPM) from July 2013 to June 2017, and the Secretary of the Executive Council of HKIPM from July 2017 to June 2019. His research projects have won the Project Management Achievement Awards (Category: Research) organized by HKIPM and the Asia Pacific Federation of Project Management (APFPM) for many years.

Dr FAN Hongqin
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Teaching Areas
Temporary Works Design, Structural Analysis and Design

Research Interests
Construction Equipment Management, Construction Knowledge Discovery through Data Mining, Construction Industry Microeconomic Analysis, Computer Integrated Construction, Computer-Assisted Instruction in Engineering Education

Biography
Dr Fan received his Bachelor's degree in Hydraulic Structure Engineering from Tsinghua University in 1991, MSc in Construction Engineering and Management from the University of British Columbia in 2003, and PhD in Construction Engineering and Management from the University of Alberta in 2007. He worked for 10 years in the construction industry before switching to academia. He was with the China Harbor Engineering Company from 1991 to 2000, serving as a project engineer for the Macau International Airport, CHEC between 1993 and 1995, and worked with All-span Construction Engineering Ltd, Canada in 2000. He was an assistant professor of construction technology at Missouri Western State University, Saint Joseph, Missouri, USA in 2007/2008 before joining The Hong Kong Polytechnic University in 2008.

Dr SEO JoonOh
徐準昨 博士
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Teaching Areas
Construction Information Technology, BIM, Construction Materials

Research Interests
Sensing Technologies (e.g., computer vision, wearable sensors) for Safety and Health Monitoring, Construction Ergonomics, Computer Simulation

Biography
Dr Seo received his bachelor's and master's degrees in Architectural Engineering from Seoul National University in South Korea. He obtained his master's degree in Industrial and Operations Engineering (specializing in Ergonomics) and his PhD degree in Civil Engineering (construction management program) from the University of Michigan in the United States in 2016. Prior to starting his PhD, he gained 5 years of industry experience in construction, working as a cost and safety manager in building construction projects in South Korea. His research focuses on understanding the relationship between construction workers' physical demands and their impact on construction operations. In his studies, various computing and IT approaches—including vision-based motion capture, machine learning-based action recognition, and computer simulation such as discrete event simulation and system dynamics—have been applied and implemented. Additionally, he is interested in total scene understanding and wearable sensing, aiming to enhance construction workers' performances in terms of safety, health, and productivity.

Dr WONG Siu Wai
黃小慧 博士
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Teaching Areas
Land Use Planning, Urban Planning, Real Estate Development, Property Valuation

Research Interests
Urbanization and Local Governance, Urban-rural Relationships, Community Planning, Property Rights Reform

Biography
Dr Ivy Wong received her PhD in Planning (2014) from the University of British Columbia, Master of Development Planning (2004) with High Distinction from the University of Queensland, and BSc (Hons) in Real Estate (1998) from the Hong Kong Polytechnic University. As a General Practice Surveyor, Ivy is a professional member of both the Royal Institute of Chartered Surveyors (RICS) and the Hong Kong Institute of Surveyors (HKIS). Starting with her professional practice in a private real estate firm, she subsequently worked for three departments in the Hong Kong SAR Government, including the Lands Department, the Housing Department, and the Rating & Valuation Department. Her specialized areas include land premium assessment for land sale and lease modification, compensation assessment for land acquisition, public housing planning and development, and mass valuation for property taxation. Dr Wong is the founder and convener of the China Innovative Urban-rural Governance (CIURG) Research Network, which provides a platform to connect peers and stakeholders who are interested in the exchange of ideas and research collaboration about urbanization and local governance transformation in China (http://ciurgpolyu.wixsite.com/home).Working with all research collaborators of CIURG, Dr Wong is dedicated to advancing both academic research and policy studies on the various aspects of urbanization and governance in China, such as urban and rural planning, community participation, local capacity building, rural property rights transformation, rural institutional reform, social inclusion, welfare and resilience of transitional urban neighborhood, and so on.

Department of Building and Real Estate

Dr Esther YUNG
容曉君 博士
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Teaching Areas
Urban Planning and Urban Design, Development Control Law, Research Methods

Research Interests
Ageing and Built Environment, Heritage Conservation, Urban Sustainability

Biography
Dr Esther Hiu Kwan YUNG held MSc and PhD degrees from the Department of Real Estate and Construction at the University of Hong Kong. She also obtained a Bachelor of Architecture from the University of New South Wales, Australia. Dr Yung worked as an assistant architect in two renowned architectural firms in Hong Kong before studying for her PhD. After obtaining her PhD, she worked as a research officer in a NGO for the handicapped for two years. She is a chartered surveyor of the RICS under the Planning and Development pathway. Dr Yung joined the Hong Kong Polytechnic University as a Postdoctoral Research Fellow in BRE. She was appointed Assistant Professor in Planning and Development in 2014 and promoted to Associate Professor in 2020. She has published extensively in top refereed journals in the areas of built heritage conservation, as well as ageing and the built environment. She received the Departmental Research Publication Award (2014-15). She has obtained external funding from the Research Grants Council of Hong Kong (RGC) and the Hong Kong Government Policy Innovation and Coordination Office (PICO). She serves as the associate editor of the Journal of Housing and the Built Environment.

Dr WEI Hsi-Hsien
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Teaching Areas
Environmental Impact Assessment, Information Management for Construction and Real Estate

Research Interests
Construction Project Management, Resilience and Sustainability of the Built Environment, Disaster Risk Management, Information Technology Applications in Construction Engineering, Machine Learning in Disaster Management

Biography
Dr Wei's research covers a broad range of topics such as resilience and sustainability of buildings, information technology in construction engineering and management, project management, machine learning in disaster management, and climate change adaptation. He was a Senior Research Fellow in the Department of Structural Engineering at Ben-Gurion University in Israel, working on the assessment of the resilience and sustainability of urban systems to extreme events on behalf of Israel's Ministry of Science, Technology and Space. With solid experience in consulting and professional practice in the design and management of major sustainable construction projects, Dr Wei is a US Green Building Council LEED AP specializing in Building Design and Construction.

Dr CHI Hung-Lin
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Teaching Areas
Construction Technology and Material, Advanced Construction Technology

Research Interests
Advanced Construction Machinery Planning and Management, Building Information Modelling, Sensing and Tracking Technologies in Construction, Visualization in Engineering

Biography
Dr Chi joined PolyU in June 2017 and has been an Assistant Professor since July 2020. He was studying in a Computer-Aided Engineering group in the Department of Civil Engineering at National Taiwan University until he received his PhD degree. The topic of his PhD study was about the development of an AR-enhanced teleoperation crane and its user interface. After graduation, he was a research fellow in the Australasian Joint Research Centre for Building Information Modelling at Curtin University from 2013 to 2017. Since Dr Chi joined the department, his teaching duties cover the construction technology-related subjects. In 2018, he was a recipient of the Discovery Early Career Research Award from Australian Research Council. The proposed research topic of the award was about automatic motion planning considering operational concerns of crane tasks. His current research includes developing route re-planning algorithms for construction craneage optimization; integrating construction management theorems (e.g., lean) in the VR environment for construction worker and equipment operator training; AI approaches for operator's fatigue detection; and BIM-enabled system integrations for construction inspection and infrastructure monitoring.

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Teaching Areas
Economics for Urban Studies; Housing Studies; Economic Forecasting

Research Interests
Housing Economics; Household Finance; Chinese Economy

Biography
Dr Fan received her PhD degree in Real Estate Economics and Management from Tsinghua University in 2018 and her bachelor's in Construction Management from Southeast University in 2013. Prior to joining the Department of Building and Real Estate as an Assistant Professor of Construction and Real Estate Economics in 2020, she was a Research Fellow at the National University of Singapore (2018-2020) and a Vsiting Scholar at the University of Wisconsin-Madison (2016-2017). Her major research interests are in real estate economics and household finance, specializing in housing price dynamics, household consumption and housing demand under uncertainty, household mortgage choice and risk management, and housing market policies.

Dr HOU Yuting
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Teaching Areas
Research Methods, Project Studio, Urban Studies and Planning

Research Interests
Land Use and Accessibility; Transportation and Economic Development; Evolution of Metropolitan Spatial Structure; Applied Spatial Analysis

Biography
Dr Yuting Hou received her BEng in Land Information Technology/Land Management from Wuhan University and her MSc in Human Geography from Peking University. She holds a PhD in Policy, Planning and Development from the Sol Price School of Public Policy, University of Southern California, where she was awarded the John Dyckman Award for Best Dissertation in Planning. Before joining PolyU, Yuting was a research fellow in the Lee Kuan Yew Centre for Innovative Cities at the Singapore University of Technology and Design.

Dr LEE Minhyun
李旼炫 博士
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Teaching Areas
Project Management, Construction Engineering Management, Building Energy and Environmental Management

Research Interests
Smart and Sustainable Building Management, Building Energy Management, Rooftop Solar Photovoltaic (PV) Adoption, Building and Renewable Energy Policy, Virtual Reality (VR) Application

Biography
Dr Minhyun Lee joined the Department of Building and Real Estate (BRE) at the Hong Kong Polytechnic University (PolyU) as an Assistant Professor in September 2020. She received her doctoral degree in Architectural Engineering at Yonsei University, Seoul, South Korea in 2018, specializing in smart and sustainable building management. She received her master's degree in Architectural Engineering in 2014 and bachelor's degree in Architecture in 2012, both at Yonsei University. Prior to joining BRE, she was a visiting scholar in the Energy Institute at the University of Texas at Austin (UT Austin) as well as a Research Professor in the Department of Architecture and Architectural Engineering at Yonsei University. She also served as a Lecturer in the Department of Architecture and Architectural Engineering at Yonsei University in 2018. Dr Lee studies and investigates technical, economic, environmental, social, and behavioral aspects in the built environment for smart and sustainable buildings, communities, and cities. Under this goal, her major research interests include modeling diffusion of clean energy technologies and energy saving behaviors, understanding various human responses to different built environments, and improving building and renewable energy policy. To achieve this, she utilizes various research approaches such as data analytics, computer simulation, VR experiment, and IoT sensing.

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Teaching Areas
Business Valuation, Development Finance, Construction Economics

Research Interests
REITs, Real Estate Finance, Urban Studies, Credit Rating, CSR, Asset Pricing

Biography
Dr Shen completed his PhD degree in Real Estate Finance at The University of Hong Kong. He obtained a bachelor's degree in Land Management and master's degree in Finance from Renmin University of China in Beijing. He joined The Hong Kong Polytechnic University as an Assistant Professor in 2019. Dr Shen's research covers a broad range of topics in real estate economics and finance, urban studies, credit rating, corporate social responsibility and asset pricing. He is also a certificated FRM (Financial Risk Manager) and CFA (Chartered Financial Analyst) charterholder.

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Teaching Areas
Principles of Project Management, Construction Process Management, Measurement, Documentation, Estimating, Project Supervision and Contract Administration, Measurement and Estimation

Research Interests
Project Scheduling and Resource Allocation, Operations Simulation and Optimisation, Project Planning, Control, and Visualisation, Resource Sensing and Tracking Technology, Construction Robotics and Automation

Biography
Dr Francis Siu received his Bachelor of Engineering (2009) and his Master of Philosophy (2011) from the Department of Civil and Structural Engineering at The Hong Kong Polytechnic University. In 2015, he received his Doctor of Philosophy from the Department of Civil and Environmental Engineering at the University of Alberta, Canada. Dr Siu is an engineer, educator, and researcher by profession. Before returning to his alma mater, The Hong Kong Polytechnic University, as a faculty member, he worked as an engineer and consultant in construction companies in Canada, an instructor in the Department of Civil and Environmental Engineering at the University of Alberta, Canada, and postdoctoral scholar to build and supervise research teams in the Department of Civil and Environmental Engineering at the University of Alberta, Canada. Dr Siu's teaching focuses on general project management, construction process simulation, building measurement, cost estimation, tender documentation, and contract administration. His research focuses on the development and application of innovative construction methods and technologies in the fields of project planning, control, and visualisation. He also serves as an editor and board member for reputable construction-related journals. Building upon the industrial experience he gained through research collaboration with construction companies in Hong Kong and Canada, Dr Siu continues to advance his knowledge of the practical construction of buildings, infrastructure, and industrial facilities.

Department of Building and Real Estate

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Teaching Areas
Real Estate Development, Project Studio, Research Methods

Research Interests
Urban Studies, Ageing, Health, Land Development

Biography
Dr Sun joined the Faculty of Construction and Environment in July 2017. His primary research areas include land development, urban sustainability, resilience, and ageing. His current research projects examine how built environment facilitates the quality of life of older persons, and provide evidence-based suggestions for planning and design of age-friendly communities. Professionally, Dr Sun joined the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) as an expert panel member to review disaster-related statistics. He has also been invited as overseas expert to guide and review the age-friendly city projects in Taiwan and Mainland China.

Dr TAN Zheng Tanya
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Teaching Areas
Design Conversion and Adaption, Urban Planning Workshop, Capstone Project

Research Interests
Sustainable Urban Development, Urban Microclimate and Thermal Comfort, Design and Human Well-being

Biography
Dr Tanya Z. Tan received her PhD in Architecture from The Chinese University of Hong Kong in 2016. She was a Research Fellow in the School of Civil and Environmental Engineering, Nanyang Technological University, and a Postdoctoral Fellow in the Institute of Future Cities, The Chinese University of Hong Kong. She then joined the Mechanical and Civil Engineering Department at Hautes Études d'Ingénieur, Université Catholique de Lille for teaching and research. Her research interests focus on sustainable design, urban climate and urban walkability, age-friendly cities, design and human perception. Since 2014, Tanya has been involved in teaching architectural design studio, sustainable urban planning, green building design strategies, and computer simulation (microclimate modelling and building energy performance simulation).

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Teaching Areas
Construction Technology and Materials

Research Interests
Digital Construction; 3D Concrete Printing; Construction Materials

Biography
Dr Yiwei Weng received his dual bachelor's degrees (2014) in material science engineering (major) and financial engineering (minor) from the University of Science and Technology Beijing, master's degree (2015) in mechanical and aerospace engineering from the Nanyang Technological University (NTU). He received his PhD in civil and environmental engineering from NTU in 2020. Before joining PolyU, he was a Research Fellow at the NTU (2020-2021). His research focuses on digital construction, specializing in developing sustainable printable materials, integrating building information modeling, and designing novel printing systems.

Dr YI Wen
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Teaching Areas
Construction Project Management; Research Methods for Construction and Real Estate; Productivity in Construction

Research Interests
Optimization in Construction Management; Sustainable Construction; Occupational Health and Safety

Biography
Dr Wen Yi is an Assistant Professor at the Department of Building and Real Estate (BRE). Prior to joining the Hong Kong Polytechnic University, Dr Yi worked as a Senior Lecturer at Massey University, New Zealand. She obtained her PhD at BRE and had more than two years postdoctoral experience in Hong Kong and Australia. Her research covers optimization in construction management, construction safety and health, and construction engineering and management.

Dr Amos DARKO

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Teaching Areas
Construction Technology and Management, Construction Project Management, Construction Economics, Research Methods

Research Interests
Sustainability, Sustainable Built Environment, Sustainable Construction, Green Building, Modular and Offsite Construction, Building Information Modelling (BIM), Artificial Intelligence (AI)

Biography
Dr Darko received his PhD degree in Construction and Real Estate Management from PolyU in 2019, and BSc degree (First Class Honours) in Construction Technology and Management from Kwame Nkrumah University of Science and Technology (KNUST) in 2014. Prior to his current appointment, he worked as a Postdoctoral Fellow and as a Research and Teaching Assistant at PolyU and KNUST, respectively. He has published widely in leading international journals, conferences and books. His publications are rated by the Web of Science as "Highly Cited" and "Hot" publications. He is associate editor of Green Building and Construction Economics journal, guest editor of Energies journal and Applied Sciences journal, and a member of the editorial board of other journals. He is also an active reviewer for several international journals. He received the Global Top Peer Reviewer Award from the Web of Science Group in 2019. He has received several other awards, including the Best Construction Technology and Management Student Award from KNUST in 2014, the Outstanding Overseas Young Scholars Grant from Central South University in 2019, and the Green Talents Award from the German Federal Ministry of Education and Research in 2020. A Design for Manufacture and Assembly (DfMA) certified academic, his research interests cover sustainability, sustainable built environment, sustainable construction, green building, modular and offsite construction and digital applications including building information modelling (BIM), artificial intelligence (AI) and other digital technologies.

Dr Shahnawaz ANWER

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Teaching Areas
Construction & Maintenance Technology; Advanced Research Methods; Ergonomics; Wearable Sensing Technology

Research Interests
Ergonomics; Occupational Health and Safety; Exoskeleton Devices; Work-related Musculoskeletal Disorders and Fatigue; Wearable Sensors; Rehabilitation

Biography
Dr Anwer is a Research Assistant Professor of Ergonomics and Construction Safety in Department of Building and Real Estate at the Hong Kong Polytechnic University. Dr. Anwer earned his bachelor's (2007) and master's (2009) degrees in physiotherapy from Hamdard University, India. He obtained his PhD in Construction Informatics from Department of Building and Real-Estate, the Hong Kong Polytechnic University in 2021. Overall, He has published 107 articles in high ranking journals. His is respected by the academic community, as evidenced by the number of citations received over the years for his published papers (Google scholar citation, 2610; H-index 28). He is a reviewer for more than 30 international journals. He is an Associate Editor for BMC Musculoskeletal Disorder Journal and Journal of Manual and Manipulative Therapy. He has also acted as a guest editors for Building and Healthcare journals of MDPI. He has received Occupational Safety & Health (OSH) Student Research Scholarship for the 2021 Academic Year.

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Teaching Areas
Construction Technology, Construction Material

Research Interests
Digital Construction, Intelligent Sensing, Construction Safety, Machine Learning

Biography
Dr Shuai HAN (Jason) received his Ph.D. degree and M.Eng degree from Tianjin University in 2021, and B.Eng degree from Northwest Agriculture and Forestry University in 2015. Dr HAN is a researcher with multidisciplinary skills, and his research area covers smart construction, geological engineering, dredging construction, geosciences, geographic information system, building information models, etc. His achievements are diversified with many papers published in Science Citation Index journals, several granted patents and computer software copyrights, and a book. He is an affiliate member of the Chinese Society for Rock Mechanics & Engineering. He has rich research and engineering experiences and has participated in more than ten research projects supported by the National Natural Science Foundation of China and state-owned enterprises.

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Teaching Areas
Research Methods; Maintenance Operation and Management

Research Interests
Construction Industrialization and Informatics

Biography
Dr Xiao LI received his Ph.D. degree from PolyU in 2019, B.Eng degree, and M.Eng degree from Chongqing University in 2013 and 2016, respectively. Before joining PolyU as a Research Assistant Professor of Construction Industrialization, he was an RGC Postdoctoral Fellowship awardee at The University of Hong Kong and assistant director at Qianhai Institute for Innovative Research. He was also a visiting scholar at the University of Cambridge and Curtin University. His research interests mainly focus on construction industrialization and construction informatics. He has led 6 research projects with funding exceeding HK$ 5million and has authored 40+ papers in peer-reviewed academic journals with 2200+ citations (17 first & corresponding authored papers, 3 ESI highly cited, 4 Most cited papers in Automation in Construction). He is a fellow of the SYLFF Association, a National Certified Construction Engineer, a member of CIB and the American Society of Civil Engineers, and guest editors of several leading journals in construction engineering and management. He held several international academic awards, e.g. SYLFF Research Grant Award, Research Abroad Award, CIB Sebestyén Future Leaders Award, ASCE Best Paper Award, and CIOB (HK) Outstanding Paper Award. His research mainly contributes to the smart work packaging methodology for collaborative planning and control in construction. Firstly, he investigated the work package generation mechanism for complex construction products. Then, he made a breakthrough in the stochastic optimization method of work package sizing under uncertainties. Finally, he developed a smart work packaging system for crowd intelligence-based collaborative planning and control.

Department of Building and Real Estate

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Teaching Areas
Construction Economics and Finance; Construction Law; Measurement, Documentation and Estimating

Research Interests
Infrastructure Procurement Automation, Construction and Real Estate Finance, Engineering Ethics, Quantity Surveying Digitization, and Urban Infrastructure Economics, Policy, and Governance

Biography
Dr Emmanuel Kingsford Owusu is a Research Assistant Professor of Construction and Real Estate Economics at the Department of Building and Real Estate, The Hong Kong Polytechnic University. Dr Owusu obtained his bachelor's degree from the Kwame Nkrumah University of Science and Technology. His major was in Quantity Surveying and Construction Economics, and he was the only student to have obtained first-class honors in a graduating class of over a hundred students. Following his success at the bachelor's degree level, Dr Owusu received the Hong Kong PhD Fellowship Scheme Award to pursue his doctoral study at the Hong Kong Polytechnic University under the supervision of Professor Albert Chan. Not only did he obtain a distinction in his taught courses, but he also won several awards during his PhD study. Prior to assuming his new RAP position, he was a post-doctoral fellow in the same Department for four months. His current research project focuses on smart infrastructure procurement, where he intends to develop a hybrid platform that integrates machine learning, smart contracts, and cloud computing to automate the procurement process of infrastructure-related projects.

Dr TENG Yue
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Teaching Areas
Research Methods, Professional Workshop and Project, Construction Practice in China

Research Interests
Zero Carbon, Prefabrication and Modular Integrated Construction (MiC)

Biography
Dr Yue TENG is a Research Assistant Professor in the Department of Building and Real Estate at the Hong Kong Polytechnic University (PolyU). She received her PhD degree from HKU in 2020, and M. Mgt degree, and B. Mgt degree from Chongqing University in 2016 and 2013. Before joining PolyU, Dr Yue TENG worked as a Postdoctoral Fellow and Technical Manager of Net Zero Laboratory (NetZeroLab) at the University of Hong Kong (HKU). Her research covers zero carbon, prefabrication and modular integrated construction (MiC).

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Teaching Areas
Construction Methods, Building Information Modeling (BIM), Automation in Construction, Engineering Structure

Research Interests
Construction Informatics, Advanced Construction Technologies, Robotics in Construction, and Modular Construction

Biography
Dr Bo XIAO (Eric) is a Research Assistant Professor at the Department of Building and Real Estate, The Hong Kong Polytechnic University. He received his Ph.D. degree from the University of Alberta in 2021, MASc degree from Concordia University in 2017, and Bacholer degree from the Xi'an University of Architecture and Technology in 2015. He worked as an image algorithm engineer from 2017 to 2018 for developing deep learning algorithms to assist self-driving cars. He is an affiliate member of the American Society of Civil Engineers (ASCE). His research interests include construction informatics, AI in construction, and Project Management.

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Teaching Areas
Building Maintenance

Research Interests
Construction Safety; City Resilience

Biography
Dr Jackie YANG is a Research Assistant Professor of Urban Sustainability Policy in the Department of Building and Real Estate (BRE) at The Hong Kong Polytechnic University (PolyU). She obtained her doctoral degree from BRE at PolyU in December 2015 and her master's degree from the City University of Hong Kong in 2011. At Huazhong University of Science and Technology, she received double bachelor's degrees in Economics and Architectural Design. She received the OSH Student Research Scholarship 2014 from the Occupational Safety and Health Council. Prior to her current appointment, she worked as a Postdoctoral Fellow in BRE and a Senior Officer at the Construction Industry Council. Her research focuses on construction safety and city resilience.

Department of Civil and Environmental Engineering

Prof. POON Chi Sun
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Teaching Areas
Construction Materials, Waste Management

Research Interests
Sustainable Construction Materials, Circular Economy, Waste Recycling and Management, Concrete Technology

Biography
Prof. Poon obtained his PhD from Imperial College London. He is currently Department Head and Chair Professor of Sustainable Construction Materials at the Civil and Environmental Engineering Department. He is a Changjiang Scholar. Prof. Poon specializes in the research and development of environmental-friendly construction materials, waste management, waste recycling technologies, and concrete technology. He has published over 400 papers in international journals. He is a Fellow of the Hong Kong Institution of Engineers (HKIE), past chairman of the HKIE Environmental Division and past representative of the HKIE Environmental Discipline. He is also a Fellow of the Hong Kong Concrete Institute (HKCI).

Prof. TENG Jinguang
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Research Interests
Emerging Structural Materials and Systems, Fibre-Reinforced Polymer (FRP) Composites in Construction, Thin-Walled Structures

Biography
Professor Teng has authored one book and over 200 SCI journal papers. His publications have been widely cited by researchers globally, and many of his research findings have been adopted in relevant design codes/guidelines in China, Australia, Europe, the United Kingdom and the United States. Professor Teng's outstanding academic achievements have earned him numerous accolades, local and overseas. He was elected in 2017 as Member of the Chinese Academy of Sciences, which is the highest academic title in the field of science and technology in China, Corresponding Fellow of the Royal Society of Edinburgh in 2015, and Fellow of the Hong Kong Academy of Engineering Sciences in 2013. He won the State Natural Science Award of China (Second Class) in 2013 and the Distinguished Young Scholar Award from the National Natural Science Foundation of China in 2004. At PolyU, Professor Teng was the recipient of The President's Award for Excellent Performance/Achievement 2013/2014 in the category of Research and Scholarly Activities.

Prof. Ben YOUNG
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Teaching Areas
Structural Engineering

Research Interests
Cold-formed Steel Structures, Testing and Design of Steel Structures, Thin-walled Structures, Structural Stability, Structural Analysis, Stainless Steel Structures, Aluminium Structures, Fire Resistance of Metal Structures and Engineering Education

Biography
Professor Young received BSc, BEng and PhD degrees from the University of Sydney, Australia, in 1991, 1993 and 1998, respectively. He is currently a co-editor-in-chief of the Journal of Constructional Steel Research, ELSEVIER. He has published over 570 international journal and conference papers, of which over 280 are SCI indexed journal papers. He has an h-index of 48 in Scopus. According to the ISI's essential science indicators, Professor Young has been listed for many years in the "Top 1% scholars" for highly cited papers. He is an advisory member of the American Institute of Steel Construction (AISC) for the Committee on Structural Stainless Steel. Professor Young is also a member of the Accreditation Advisory Board under the Innovation and Technology Commission, HKSAR. He received the Michael G. Gale Medal for Distinguished Teaching Award in 2004 from the Hong Kong University of Science and Technology. He also received the Outstanding Young Researcher Award in 2006, the Outstanding Teaching Award in 2008, the Outstanding Research Student Supervisor Award in 2015 and the Outstanding Researcher Award in 2017 from the University of Hong Kong. Professor Young received the Best Research Paper Award given by the Journal of Structures, ELSEVIER in 2016. He also received the Shortridge Hardesty Award given by the American Society of Civil Engineers in 2020.

Prof. LI Xiangdong
李向東 教授

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Teaching Areas
Environmental Impact Assessment, Environmental Management System and Audit, and Environmental Science

Research Interests
Air Pollution and Health, Regional Environmental Issues, and Land Contamination and Remediation

Biography
Prof. Li obtained BSc in Earth Sciences and MSc in Geochemistry from Nanjing University, and PhD in Environmental Technology from Imperial College London. His major research interests include regional environmental pollution, urban environment and health, and remediation of contaminated soils. His recent research projects have mainly focused on environmental changes in rapidly developing regions. Prof. Li's research team has been engaged in the study of trace metals, organic pollutants and antimicrobial resistance (AMR) in atmospheric particles, soils, sediments, and biological samples, including their impacts on human health and ecological systems. He has been the principal investigator of numerous research projects funded by RGC, UGC Area of Excellence Scheme, and NSFC. He has published more than 250 papers, mostly in leading international journals. More than ten of his publications have been listed among the top 1% most cited papers in Environment/Ecology by the WoS databases. His current research topics consist of the environmental loadings and implications of emerging contaminants in surface environments, and the emissions, transport and environmental fate of metal and organic pollutants. He is an Associate Editor of *Environmental Science and Technology (ES&T)* and Deputy Editor of *ACS Environmental Au*. Prof. Li was honoured with the Clair C. Patterson Award 2022 in recognition of his innovative and dynamic work in environmental geochemistry, including research in the fields of regional contamination, urban air $PM_{2.5}$ pollution, and the origin and dissemination of antimicrobial resistance.

Department of Civil and Environmental Engineering

Prof. NI Yiqing
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Teaching Areas
Structural Analysis, Structural Dynamics, Seismic Design of Building Structures, Smart Infrastructure

Research Interests
Structural Health Monitoring, Structural Dynamics and Control, Smart Materials and Structures, Sensors and Actuators, High-Speed Rail and Maglev Safety, Bayesian Inference, Physics-Informed Machine Learning

Biography
Prof. Ni is Yim, Mak, Kwok & Chung Professor in Smart Structures, Chair Professor of Smart Structures and Rail Transit at Department of Civil and Environmental Engineering, and Director of National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong Branch). Prof. Ni is a Fellow of the Hong Kong Institution of Engineers (HKIE). He is an Executive Member of International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII) and International Association for Structural Control and Monitoring (IASCM). He is a Co-Editor-in-Chief of Journal of Infrastructure Intelligence and Resilience and Intelligent Transportation Infrastructure; an Associate Editor of Journal of Civil Structural Health Monitoring and Journal of Vibration and Control; an Academic Editor of Structural Control and Health Monitoring; and an editorial board member for seven journals including Engineering Structures and Smart Structures and Systems. Prof. Ni has published more than 260 SCI journal papers indexed in Web of Science Core Collection and over 330 conference papers. His publications receive an H-index of 47 and over 8,000 citations in Web of Science Core Collection, and receive an H-index of 61 and over 15,000 citations in Google Scholar. Prof. Ni is a recipient of the 2017 SHM Person of the Year Award granted by the journal Structural Health Monitoring and the 2016 State Scientific and Technological Progress Award (Second Class) of China. He was awarded the Gold Medal and the Grand Prize twice by the International Exhibitions of Invention, New Techniques and Products in Geneva (2009 and 2013).

Prof. WANG Tao
王韜 教授

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Teaching Areas
Environmental Science, Climate Change and Society Response, Sustainable Development and Environmental Planning

Research Interests
Chemistry of Natural and Polluted Atmosphere, Air Pollution-Cloud Interactions, Urban and Regional Air Quality Management

Biography
Prof. Wang obtained his PhD from Georgia Institute of Technology in 1992. He has been a Chair Professor of Atmospheric Environment since July 2013. He has led a number of research and consultancy projects, including serving as chief scientist for China's National Basic Research Project on acid rain funded by the Ministry of Science and Technology of China (2005-2010) and the project coordinator of an ongoing HKRGC Theme-based research project. His findings have been adopted in a United Nations climate assessment report and used for air-pollution improvement at mainland China and Hong Kong. His recent research includes atmospheric chemistry of reactive nitrogen and halogens and evaluation of air-pollution policies. He was a recipient of The PolyU President's Awards for Excellent Performance/Achievements in Research and Scholarly Activities in 2019. Prof. Wang currently serves on the editorial boards of several international journals, as a scientific advisor of the Hong Kong Observatory and a member of the academic committee for several key research laboratories in China.

Prof. YIN Jianhua
殷建華 教授

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Teaching Areas
Soil Mechanics, Advanced Geotechnical Design, Geotechnical Computer Analysis and Smart Monitoring, Test Study and Constitutive Modelling of Stress-Strain Behaviour of Soils

Research Interests
Testing Study of Properties and Behaviour of Soils, Constitutive Modelling, Soft Soil Improvement, Geosynthetics-Reinforcement and Modelling, Slope Analysis and Stabilization, Smart Geotechnical Monitoring Using both Optic Fibre Sensor and Conventional Technologies, Soil /Structure Interactions, Geotechnical Numerical Analyses

Biography
Professor Yin Jian-Hua received a BEng degree in 1983, an MSc degree in 1984 in China, and a PhD from the University of Manitoba, Canada in 1990. He joined The Hong Kong Polytechnic University in 1995 as an Assistant Professor and is currently a Chair Professor of Soil Mechanics. He is Vice-President of the International Association for Computer Methods and Advances in Geomechanics (IACMAG), a co-editor of International Journal of Geomechanics (ASCE and SCI journal) and GeoMechanics and GeoEngineering – An International Journal (UK). He is also on the editorial (advisory) board of eight other journals. He received the prestigious John Booker Medal in 2008, the Chandra S. Desai Excellence Award in 2011, and an Outstanding Contributions Medal in 2017, all from IACMAG. Prof. Yin received 2000 Mao Yi-Sheng Soil Mechanics and Foundation Engineering Youth Award in China. He delivered the 2011 Huang Wen-Xi Lecture entitled "From Constitutive Modelling to Development of Laboratory Testing and Optical Fibre Sensor Monitoring Technologies" in Nanjing, China. Prof. Yin and his team have 1 patent in USA and 7 patents in China. A paper by Yin and Graham (1996) published in Geotechnique was considered one of the landmark contributions among all papers published in this journal in the past 60 years (1948-2008).

Prof. ZHAO Xiao Lin
趙曉林 教授

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Research Interests
High-performance Sustainable Materials in Civil Engineering Applications, Steel-concrete-FRP Hybrid Construction and Floating Structure Technology

Biography
Professor Zhao is a Fellow of the Australian Academy of Engineering and Technology. He held the Chair of Civil Engineering from 2001 to 2019 and then the Head of Department of Civil Engineering from 2008 to 2011 at Monash University, Australia. Before joining PolyU, Professor Zhao was the Associate Dean (International) in the Faculty of Engineering at the University of New South Wales, Australia. Professor Zhao has published 9 books and 400 refereed journal papers with an H-index over 80. He has supervised more than 50 PhD students. Professor Zhao was selected as Australia's Top Researcher in the fields of Structural Engineering and Civil Engineering in the Australian's Research Magazine in 2019 and 2021 respectively. Professor Zhao has also received a number of prestigious fellowships including the Alexander von Humboldt Fellow, the Japan Society for the Promotion of Science Invitation Fellow, the Distinguished Visiting Fellowship of the Royal Academy of Engineering, the Swiss National Science Foundation Visiting Professorship, the Changjiang Scholar Chair Professor and the Distinguished Visiting Professorship at Tsinghua University. Professor Zhao was a recipient of the International Institute of Welding Thomas Medal and Kurobane Lecture Award. Professor Zhao chaired several international committees, such as the International Institute of Welding XV-E Committee (2002-2014), Australian/New Zealand Standards Committee CS/23 (1998-2002). He served as a member on the Australian Research Council ERA (Excellence in Research for Australia) Research Evaluation Committee for Engineering and Environmental Sciences Cluster (2015, 2018), and the Australian Research Council College of Experts (2021).

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Research Interests
Structural Dynamics, Vibration Monitoring & Control, System Identification, and Damage Detection

Biography
Prof. Ko was the chairman of the accreditation board (2001-2006) of The Hong Kong Institution of Engineers (HKIE) and the monitoring committees of both the Hong Kong Asia-Pacific Economic Cooperation, and the Hong Kong Engineering Mobility Forum (2006-2009). Prof. Ko was the president of both The Hong Kong Society of Theoretical and Applied Mechanics (1999/2000) and The Hong Kong Association for the Advancement of Science and Technology (2000/01). He was also a member of the Construction Industry Council (2007-2010), and an advisor of the Beijing-Hong Kong Academic Exchange Centre (since 2002). He is the editor-in-chief of Smart Structures and Systems, and a member of the scientific steering committee of the State Key Laboratory on Disaster Reduction in Civil Engineering (2009-2013). Prof. Ko was president of the Asian-Pacific Network of Centres for Earthquake Engineering (2005-2007), and a council member of the International Society for Structural Health Monitoring of Intelligent Infrastructures (since 2004). Prof. Ko was inducted into the Hall of Fame of the HKIE in 2010. In 2011, he was presented the HKIE Gold Medal, and the prestigious Aftab Mufti Medal from the International Society for Structural Health Monitoring of Intelligent Infrastructure in recognition of his lifetime achievement in civil structural health monitoring. He was conferred the degree of Doctor of Engineering honoris causa at PolyU on 12 Nov 2016.

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Teaching Areas
Highway Engineering, Transport Planning and Management, Design of Transport Infrastructure, and Public Transport

Research Interests
Transport Planning and Traffic Forecasting, ITS Technology and Development, Smart Surveillance and Traffic Simulation, Public Transport, and Pedestrian Studies

Biography
Ir Prof. William H.K. Lam received his PhD degree from University of Newcastle upon Tyne, United Kingdom. He is currently the Chair Professor of Civil and Transportation Engineering and has been the Head of the Department of Civil and Environmental Engineering (CEE) of The Hong Kong Polytechnic University from July 2013 to June 2019. He has also been an Honorary Professor at the Institute for Transport and Logistics Studies, The University of Sydney, Australia since 2015. He was appointed Chiang Jiang Scholars Chair Professor at Beijing Jiaotong University from 2010 to 2013. Ir Prof. Lam has over 40 years of professional experience in research and practice for planning and design of transport infrastructures. He served as a council member of The Hong Kong Institution of Engineers (HKIE) (www.hkie.org.hk) from 2018 to 2020. He is also the past chairman of the Civil Division and of Logistics and Transportation Division, HKIE. He is the Founding President of the Hong Kong Society for Transportation Studies (www.hksts.org). Ir Prof. Lam is the founding editor-in-chief of the SCI Journal Transportmetrica and is currently one of the editors-in-chief of Transportmetrica A: Transport Science (https://www.tandfonline.com/toc/ttra21/current). He was the convenor of the international advisory committee of the International Symposium on Transportation and Traffic Theory (http://isttt24.buaa.edu.cn/Committees.htm) from July 2015 to July 2022 and currently still serves as a member of the committee. He is also currently a member of the international scientific committee of the International Symposium on Transportation Network Reliability (www.instr.org). Ir Prof. Lam is the author of more than 330 SCI journal papers or book chapters, 240 conference papers and 80 consultancy reports.

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Research Interests
Wind Effects on Tall Buildings and Long Span Bridges, Structural Health Monitoring of Large Civil Structures, Structural Vibration Control and Smart Structures, Seismic Effects on Tall Buildings and Long Span Bridges

Biography
Prof. Xu is now Emeritus Professor of Structural Engineering at The Hong Kong Polytechnic University. He was Dean of the Faculty of Construction and Environment from 2014 to 2020 and Head of the Department of Civil and Environmental Engineering from 2007 to 2013. He received his PhD from the University of Sydney in Australia. Prof. Xu has conducted researches and served as a consultant in structural engineering for over three decades. He has published 3 scientific books and over 300 SCI journal papers, delivered over 100 keynote or invited lectures at international conferences/ symposiums/ workshops. Prof. Xu also served in various capacities for relevant international associations and international journals. He is on the Civil Engineering list of the Most Cited Researchers developed for Shanghai Ranking's Global Ranking of Academic Subjects 2016 by Elsevier. In recognition of his outstanding research achievements, he received several prestigious awards, including the Guanghua Engineering Science and Technology Award in 2018, the IAWE Davenport Medal in 2018, the ASCE Robert H. Scanlan Medal in 2012, the Qian Ling Xi Computational Mechanics Award in 2010 and the Croucher Award in 2006. He has been engaged in many high-impact knowledge-transfer projects, including the health monitoring projects on the Tsing Ma Bridge and the Stonecutters Bridge in Hong Kong, the CCTV Tower in Beijing and the Shanghai Tower in Shanghai.

Prof. Anthony CHEN

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Teaching Areas
Traffic Engineering and Control, Public Transport, Smart Transport, Urban Big Data, Transportation Optimization and Simulation Methods

Research Interests
Transportation Systems Modeling and Analysis, Transportation Network Reliability/ Vulnerability/ Flexibility/ Redundancy/ Resiliency Analysis, Nonmotorized Transport Modeling, Applied Optimization to Civil Infrastructure Problems

Biography
Prof. Chen received his BS, MS, and PhD degrees in civil engineering specializing in transportation systems engineering from the University of California at Irvine. Prior to joining PolyU, he was a Professor in the Department of Civil and Environmental Engineering and Head of the Transportation Division at Utah State University in the United States for seventeen years. Prof. Chen was a recipient of the Faculty Early Career Development Award from the US National Science Foundation (NSF) in 2002. He also served as the Chang Jiang Chair Professor at Tongji University, Shanghai, China from 2015 to 2017. Prof. Chen was a member of the Transportation Network Modeling Committee of the Transportation Research Board from 1999 to 2009, and an editorial board member of the ASCE Journal of Urban Planning and Development from 2007 to 2014. He is currently an associate editor for Transportmetrica A: Transport Science, Networks and Spatial Economics, and Journal of Advanced Transportation, and an editorial board editor of Transportation Research Part B: Methodological.

Department of Civil and Environmental Engineering

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Teaching Areas
Structural Mechanics, Structural Design, Steel and Steel-concrete Composite Structures, Fire Engineering and Fire Protection

Research Interests
Effective Use of High Strength Steels in Buildings and Bridges, Effects of Welding, Cyclic Ductility and Hysteretic Behaviour, Steel Structures, Steel-concrete Composite Structures, Light Gauge Construction, Metal Roof Systems, Code Development, Structural Fire Engineering, Computational Heat Transfer, Real Fires in Buildings and Tunnels, Structural Bamboo

Biography
Prof. Chung is a renowned academic, researcher and structural engineer with established expertise in steel construction. Currently, Prof. Chung is Founding Director of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) at the University since its establishment in 2015 with endorsement of the State Ministry of Science and Technology, China. Prof. Chung graduated from the Sheffield University with a First Class Honours in 1984, and he obtained his PhD from the Imperial College of Science, Technology and Medicine of the University of London in 1988. He worked at the Steel Construction Institute for 6 years before returning to Hong Kong in 1995. Prof. Chung joined the University in 1996. Prof. Chung works on a wide range of inter-disciplinary engineering analysis and design, especially on modern steel and composite building structures. His research interests include limit state analysis and performance-based design of structural systems, structural fire engineering and fire protection in buildings and tunnels, and design codification. In recent years, with strong support from the construction industry as well as various government departments and agents, Prof. Chung has extended his applied research interests into construction sustainability, durability of infrastructure, and corrosion protection of structural steelwork. Over the past years, Prof. Chung served the Hong Kong Institution of Engineers and the Institution of Structural Engineers, U.K. in various capacities. At present, Prof. Chung is Vice President of the Institution of Structural Engineers, U.K., Board Member of the Construction Industry Council in Hong Kong, and also President of the Hong Kong Constructional Metal Structures Association.

Prof. GUO Hai
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Teaching Areas
Air and Noise Pollution Studies, Air and Noise Pollution Control, Introduction to Environmental Science, Introduction to Indoor Air Quality, Environmental Engineering and Air Pollution Control Engineering, Environmental Life Cycle Assessment, Global Climate Change and Society Response

Research Interests
Atmospheric Chemistry, Ozone Pollution, Organic Aerosol, Acidic Ultrafine Particles, Indoor Organic Chemistry

Biography
Prof. Guo investigates anthropogenic and natural contributions to chemical composition of the troposphere, interactions of air pollution with ecosystems, and volatile organic compounds and aerosol composition and chemistry. A unique theme in his research is to understand the formation of photochemical smog, in which ozone and secondary organic aerosol are the main components. One of his major foci is to drive the cutting edge of observational and numerical capabilities by developing and applying novel simulation models and analytical instrumentation, providing new research approaches to solve elusive scientific questions. Prof. Guo is among the first in the world to have developed a photochemical trajectory model and a photochemical box model incorporating a benchmark mechanism to understand ozone formation mechanisms, and a method to measure ambient ultrafine acidic particles. Recently, he is making pioneering efforts to measure ambient organic aerosols online. He develops instrumentation and numerical models, engages in intensive field campaigns, performs controlled laboratory experiments, and utilizes models of atmospheric physical and chemical processes, all with the goals of understanding the composition and chemistry of earth's atmosphere, how it functions naturally, and how it is influenced by man-made emissions and changing climate. Prof. Guo is an investigator of more than 55 research projects. He has published 147 papers with over 5600 citations and h-index of 42. He is an editor of Aerosol and Air Quality Research, and Atmosphere and editorial board member of Atmospheric Environment.

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Teaching Areas
Design of Concrete Structures, Advanced Concrete Mechanics, Maintenance of Concrete Infrastructures

Research Interests
Fibre-Reinforced Polymer (FRP) Composites for Infrastructure Applications, Durability and Life Cycle Management of Marine Concrete Structures, High Performance Fibre-Reinforced Cementitious Composites, Multi-functional Coating for Concrete Structures, Geopolymer Concrete

Biography
Ir Prof. Jian-Guo Dai graduated with his PhD in social infrastructure engineering from Hokkaido University, Japan. Before joining PolyU in 2008, he worked as a research engineer for two-and-a-half years in the Life Cycle Management Research Center of Coastal Infrastructures, Port and Airport Research Institute, Japan. His research theme is "Emerging materials and structural systems for sustainable concrete infrastructures". He has received many academic awards for his research work, including the "Best Basic Research Paper Award" from American Society of Civil Engineers, Journal of Composites for Construction, "Distinguished Young Scholar of FRP Application Committee of the Chinese Society of Civil Engineers", "International Outstanding Collaboration Award" from Japan Society of Civil Engineers, and "Structural Excellence Award-Grand Award" from Hong Kong Institution of Engineers. In 2020, Prof. Dai's research on eco-friendly concrete coating was highlighted by "Science" in its "Editor's Choice" and reported by public media like "Ta Kung Pao" and "Hong Kong Economic Journal". Prof. Dai is in the "World's Top 2% Scientist-Stanford University Releases List" in the "Civil Engineering" and "Materials Science and Engineering" disciplines. He has published more than 350 technical papers (including some 200 SCI journal papers with more than 6500 citations and h-index = 45 at Web-of-Science as of February 8th 2023).

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Teaching Areas
Air and Odour Pollution, Indoor Air Quality Management, Air Pollution Control, Risk Assessment and Management

Research Interests
Indoor/Outdoor Air Pollution Studies, Toxic Air Pollution, Emission Source Identifications, Carbonaceous Aerosol Characterizations, Risk Assessment of Air Pollution Exposure, Odour Control and Technology

Biography
Prof. Lee earned a Doctorate in Environmental Sciences at the University of California, Berkeley in 1994. He has been working on indoor and outdoor air pollution studies. Prof. Lee carried out a great number of national key research programs in chemical characteristics, sources, transportations, transformations, and environmental & health effects of urban/regional PM2.5, carbon aerosols, secondary pollutants, and toxic gaseous pollutants, providing the significant scientific and technological supports for Chinese Government to develop PM2.5 air quality standards and pollution control policies. He has completed the first and comprehensive emission inventory and source emission profiles of vehicles, cooking, ships, and household cleaners in Hong Kong. He has published more than 300 articles in international journals, been cited over 23,000 times (h-index: 90, as of October 2022, Web of Science). He was awarded as Highly Cited Researcher (cross-field) by Clarivate from 2018 to 2021. His research group won the second prize in 2012 China's State Natural Science Award on Physical & Chemical Characteristics, Formation Processes, and Environmental Changes of Aerosols from Loess and Dust. In 2016, he became one of 4 winners (Aerosol Field) in the Special Contribution Award of the 30th anniversary of Chinese Society of Particuology. In 2019, he became a Fellow of the Asian Aerosol Research Assembly (AARA).

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Teaching Areas
Water/Wastewater Treatment, Solid/Hazardous Waste Management, Contaminated Land Remediation

Research Interests
Biochar, Wood Waste, Food Waste, Green Remediation, Water Resilience, Sustainable Engineering

Biography
Our research emphasizes a strong link to societal needs and real-life environmental hallenges. We strive to advance our fundamental knowledge and develop low-carbon engineering solutions to actualize Sustainable Development Goals (SDGs). Our research team proposes new ways for solid/hazardous waste management, contaminated land remediation, and water-sensitive urban design. We perform interdisciplinary and translational research in natural and engineered systems:

- Value-added utilization of food waste, wood waste, agro-waste, sludge, and CO2
- Environmental assessment and green remediation of contaminated soil/sediment
- Stormwater harvesting and industrial wastewater treatment for resilient water cycles

More information at https://www.dan-tsang.com/
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Teaching Areas
Construction Engineering and Management, Pavement Engineering, Management of Infrastructure Systems

Research Interests
Pavement Engineering, Urban Green Infrastructures

Biography
Prof. Wang joined PolyU in 2010. He received his bachelor's degree in construction management engineering from Tongji University in China in 1996. He worked for a construction consulting firm in Shanghai before furthering his studies in the United States. Prof. Wang has master's and PhD degrees in civil engineering from the University of Kentucky, where his focus was pavement engineering and management. He has worked as a research engineer at the Kentucky Transportation Center as well as taught at Lawrence Technological University in the Civil Engineering Department and East Carolina University in the Construction Management Department. Prof. Wang is also a Registered Professional Engineer in Kentucky. He was a principal investigator or key researcher on more than 50 research grants sponsored by various Hong Kong, US and international agencies, most of which were in pavement engineering and infrastructure management. In addition, Prof. Wang has published many refereed papers, book chapters, and research reports. He also served in several professional associations and on the editorial boards of several renowned international journals. His research outcomes have won several international awards and created recognizable impacts on his profession and society.

Prof. XIA Yong
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Teaching Areas
Structural Analysis, Structural Mechanics

Research Interests
Structural Health Monitoring, Finite Element Model Updating, Structural Damage Identification, Nonlinear Vibration of Cables

Biography
Prof. Xia obtained his bachelor's degree and master's degree in 1992 and 1997 respectively, both from Huazhong University of Science and Technology (HUST). In 2002 he obtained his PhD at the School of Civil & Structural Engineering, Nanyang Technological University, Singapore. He then spent the next four years at the University of Tokyo, Japan and the University of Western Australia as a Postdoctoral Fellow. Prof. Xia joined The Hong Kong Polytechnic University in 2006 as an Assistant Professor and was then promoted to Associate Professor and Professor in 2012 and 2017, respectively. The co-author of 12 books/proceedings/standards, over 150 refereed journal papers, and over 130 international conference papers, Prof. Xia has won a State Technological Innovation Award (國家技術發明獎二等獎), Natural Science Award (教育部自然科學獎二等獎) and the Nishino Prize. He is currently a Changjiang Scholar (affiliation with HUST), the co-editor-in-chief of an SCI journal Advances in Structural Engineering and an editorial board member of several journals. Having been involved in the health monitoring of numerous landmark structures such as the Tsing Ma Bridge, Stonecutters Bridge, Canton Tower, and Shanghai Tower, he is now working on the monitoring of the Hong Kong-Zhuhai-Macau Bridge.

Prof. YIN Zhenyu
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Teaching Areas
Soil Mechanics, Geotechnical Design, Soil Behaviour and Geotechnical Modelling, Research Frontiers, Analytical and Numerical Methods in Geotechnical Engineering

Research Interests
Constitutive Modeling of Soils from Micro to Macro, Numerical Analysis for Geotechnical Engineering, Application of Artificial Intelligence in Geotechnics

Biography
Prof. Yin received his BSc in Civil Engineering from Zhejiang University in 1997, followed by a 5-year engineering consultancy at the Zhejiang Jiahua Architecture Design Institute. Then, he obtained his MSc and PhD in Geotechnical Engineering at Ecole Centrale de Nantes (France) in 2003 and 2006 respectively. Since 2008, Prof. Yin has published over 250 articles in peer reviewed international journals with an H-index of 49 according to Web of Science. He is an associate committee member of the granular materials committee of the American Society of Civil Engineers. Currently he is associate editor of "European Journal of Environmental and Civil Engineering" and "Geotechnique Letters", editorial board member of Canadian Geotechnical Journal, Acta Geotechnica, Soils and Foundations, International Journal of Geomechanics ASCE, Computers and Geotechnics and Journal of Marine Science and Engineering, etc.

Department of Civil and Environmental Engineering

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Teaching Areas
Structural Analysis; Nonlinear Finite Element Analysis of Structures

Research Interests
Emerging Structural Materials and Systems; Infrastructure Applications of Fiber-Reinforced Polymer Composites; Hybrid Tubular Structures; Strengthening of Concrete and Steel Structures; Nonlinear Finite Element Analysis of Complex Structures

Biography
Prof. Yu received his BEng degree from Zhejiang University in 2001 and his PhD degree from The Hong Kong Polytechnic University in 2007. Prior to joining PolyU as a Professor in Structural Engineering in December 2019, Prof. Yu was a full Professor in the School of Civil, Mining and Environmental Engineering at the University of Wollongong in Australia. Prof. Yu's research is mainly in the field of emerging structural materials and systems, with a focus on the infrastructure applications of composite materials. He is the author/co-author of over 130 research papers, including over 70 SCI journal papers. His journal publications have received over 2,500 citations according to the Web of Science Core Collection, leading to an H-index of 27. Prof. Yu is one of the main contributors for the national Chinese Technical Standard for Fiber Reinforced Polymer (FRP) in Construction. He serves as an editor of the journal Advances in Structural Engineering and an associate editor of the Journal of Composites for Construction. Prof. Yu received a number of prestigious awards, including the Distinguished Young Research Award from the International Institute for FRP in Construction (IIFC), and the 2018 Golden Wattle Award (Top Ten Outstanding Australian Young Chinese Youth).

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Teaching Areas
Structural Mechanics, Structural Dynamics, Seismic Design

Research Interests
Smart Materials and Structures, Structural Vibration Control, Structural Health Monitoring, Wind Energy, Energy Harvesting

Biography
Prof. Zhu obtained his BSc and MSc degrees in structural engineering from Tongji University in China and his PhD degree in civil engineering from Lehigh University in the USA. He joined The Hong Kong Polytechnic University in May 2008 and has served as Assistant Professor, Associate Professor, and full Professor in the Department of Civil and Environmental Engineering. He teaches undergraduate and postgraduate courses in structural mechanics and seismic design, and supervises undergraduate and postgraduate students in their research projects. Currently, he serves as editor of Advances in Structural Engineering and associate editor of International Journal of Nano and Smart Materials. Previously he also served as President of the American Society of Civil Engineers—Hong Kong Section. Prof. Zhu strives to promote the development and application of cutting-edge technology in structural engineering via his research and teaching at PolyU. He has published around 100 refereed journal papers and won numerous international research awards.

Dr CHAN Tak Ming
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Teaching Areas
Steel, Steel-concrete Composite Construction

Research Interests
Adaptive Structures, Circularity in Construction, Reduced Carbon Hybrid Structures

Biography
Dr Tak-Ming Chan is currently an Associate Professor in Structural Engineering at The Hong Kong Polytechnic University and a Fellow of the Institution of Structural Engineers. He also serves as Editor for Thin-Walled Structures. He is the 2022 recipient of the prestigious award, The Nishino Prize, which is presented by the East Asia-Pacific Conference on Structural Engineering and Construction (EASEC). His research achievements have also been recognized by numerous awards from the Hong Kong Institution of Engineers and the Institution of Structural Engineers. He has received multiple awards in teaching and knowledge transfer. Dr Chan graduated from the University of Hong Kong with a first-class honours degree in civil engineering before starting his structural engineering career at Arup (Hong Kong). He was the recipient of a number of prestigious University scholarships, including the Chevening Scholarship and Hutchison-EPSRC Dorothy Hodgkin Postgraduate Award. His master's degree in structural steel design and PhD in tubular structures were both from Imperial College London. He also received his Postgraduate Certificate in Academic and Professional Practice from the University of Warwick.

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Teaching Areas
Structural Concrete Design, Bridge Engineering, Construction Materials, Life-Cycle Engineering, Structural Reliability and Risk

Research Interests
Intelligent Maintenance, Urban Resilience; Structural Life-Cycle Engineering, Low-Carbon Infrastructure, Climate Change and Adaptation, Data Driven and Machine Learning

Biography
Dr You DONG is an Associate Professor of the Department of Civil and Environmental Engineering at The Hong Kong Polytechnic University (PolyU). He got his PhD degree in Structural Engineering from Lehigh University. In the past several years, he has made significant efforts to establish himself as an excellent researcher and has had some encouraging signals of success and recognition, such as being invited as the plenary speaker and panellist at a scientific conference, receiving highly competitive project funds, and joining editorial boards of international journals. Dr Dong's research background is mainly related to the application of artificial intelligence and probabilistic methods for life-cycle engineering, risk management, intelligent maintenance of structures, and urban resilience, including the quantification and promotion of infrastructure resilience and sustainability. He has gradually explored numerous novel multi-disciplinary research topics in machine learning, decision-making, and structural health monitoring. He was awarded the "Young Award for the IABMAS" by the 9th International Conference on Bridge Maintenance, Safety and Management (IABMAS 2018), World's Top 2% Scientists Released by Stanford University 2021, Outstanding Reviewer for 2020 and 2021: ASCE, etc.

Dr DUAN Huan-Feng
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Teaching Areas
Fluid Mechanics, Hydraulics, Urban Water Systems, and Waves in Hydro-systems

Research Interests
Pipe Fluid Transients; Vegetated Channel Flows; Wave-Fluid-Structure Interaction; Coastal Engineering and Storm Surges; Ocean Renewable Energy; Urban Flooding Management; Water Quality Assessment; Intelligent Urban Water Systems; Computational Fluid Dynamics

Biography
Dr Duan joined the Department of Civil and Environmental Engineering (CEE) of The Hong Kong Polytechnic University (PolyU) as an Assistant Professor in November 2013 and then promoted to Associate Professor in July 2019. He received his PhD in Civil Engineering from The Hong Kong University of Science and Technology (HKUST) with PhD research excellent award. Prior to joining HKPU, he had about two years of experience as a Postdoctoral Research Fellow in the CEE Department of HKUST and the University of Canterbury in New Zealand. He has published over 100 research papers in top peer-reviewed journals and has presented more than 40 papers in international conferences in the field of fluid mechanics and hydraulics. As Principal Investigator (PI), Dr Duan has secured several important research grants (ECS, GRF and Sub-project of TRS from Hong Kong RGC, and others) and the teaching development grant (TDG) from PolyU. Dr Duan was the recipient of ASCE Karl Emil Hilgard Hydraulic Prize (2022), IAHR Willi H. Hager JHR Best Reviewer Award (2021), PhD Research Excellence Award from HKUST (2011), and so on. He is an active member of ASCE, IAHR and ASME, and serves on the executive committee of IAHR-HK since 2014. Dr Duan has been appointed Editor-in-Chief for the Journal of Engineering Applications of Computational Fluid Mechanics (since 2014) which ranks as top Q1 journal in the JCR database (2021-2022), and the Associate Editor for the IWA Journal of AUQA – Water Infrastructure, Ecosystems and Society (since 2020, JCR Q2 journal).

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Teaching Areas
Project Management, Infrastructure Management, Project Cost Accounting and Economics

Research Interests
Infrastructure Systems and Management, Construction and Environmental Informatics, Project Management

Biography
Dr Hsu's research focuses on critical challenges and understanding the interactions between people and engineered or planned services such as building, transportation, water/wastewater, energy, and other infrastructure systems. His research is inherently interdisciplinary, integrating theories and methods from multiple disciplines, including data science, system modeling, economic and statistical analysis.

Dr LAI Siu Kai
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Teaching Areas
Noise Pollution Control, Structural Dynamics

Research Interests
Structural Dynamics, Smart Structures and Materials, Energy Harvesting Techniques, Noise and Vibration Control, Computational Fluid Dynamics

Biography
Dr Lai joined the Department of Civil and Environmental Engineering in July 2015 as an Assistant Professor. He obtained his BEng and PhD degrees from City University of Hong Kong. After graduation, he pursued postdoctoral research at the University of Western Sydney and the University of Hong Kong. Prior to joining PolyU, he worked in the construction industry and participated in many large-scale consultancy projects in Hong Kong and Macau. Professionally, Dr Lai is a Registered Professional Engineer in Hong Kong and Australia, and a Chartered Engineer of the Engineering Council (UK) and Engineers Australia. He is also a member of the Hong Kong Institution of Engineers (in both mechanical and fire disciplines), the Institution of Mechanical Engineers (UK), and the Institution of Engineers Australia. He has published more than 65 refereed journal papers and 30 conference papers in structural and mechanical engineering fields. He now serves as an editorial board member of Journal of Vibration Engineering & Technologies.

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Teaching Areas
Transportation and Highway Engineering, Pavement Materials and Design, Pavement Evaluation, and Construction Management

Research Interests
Sustainable Pavement Materials and Technologies, Nondestructive Evaluation of Transportation Infrastructure

Biography
Dr Leng received his BEng and MEng degrees from Southeast University, China, and PhD degree from the University of Illinois at Urbana-Champaign, USA. His research interests mainly include sustainable and smart paving materials and technologies, and infrastructure nondestructive evaluation. He has received several research awards, such as the 2018 Hong Kong Green Innovation Award, and 2013 AASHTO Sweet 16 High Value Research Award. His research projects have been funded by the Hong Kong Research Grants Council, Construction Industry Council, Environment and Conservation Fund, Innovation and Technology Fund, Highways Department, and Environmental Protection Department. He is the President of the ASCE Greater China Section, Vice President of Academy of Pavement Science and Technology, an executive board member of the International Association of China Infrastructure Professionals and the Hong Kong Society for Transportation Studies, and a co-opted council member of Hong Kong Institution of Highways and Transportation. He also serves as an Editor-in-Chief of Journal of Cleaner Materials, Executive Editor of Journal of Cleaner Production, an Associate Editor of ASCE Journal of Materials in Civil Engineering, and ASCE Journal of Transportation Engineering, Part B: Pavements, and an editorial board member of several other SCI journals.

Department of Civil and Environmental Engineering

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Teaching Areas
Soil Mechanics, Soil and Rock Engineering

Research Interests
Soil-structure Interactions, Optimisations of Pile Groups and Piled Rafts, Spatial Variability of Soil/Rock Properties, Geotechnical Uncertainty and Reliability Analysis, Application of Optical Fibre Strain Sensors in Geotechnical Engineering

Biography
Dr Leung received his undergraduate education from The University of Hong Kong, after which he obtained his MS degree from the University of California at Berkeley in the US and his PhD degree from the University of Cambridge in the UK. Dr Leung had been involved in a number of large-scale civil engineering projects in Hong Kong and other countries, including the United States, United Kingdom, India and Kuwait, and is active in integrating the latest research in soil-structure interactions and geotechnical reliability into engineering practice. Dr Leung is currently the Secretary-General of the Hong Kong Geotechnical Society, and has received awards including the HKIE Fugro Prize, the Departmental Teaching Excellence Award etc.

Dr LEU Shao-Yuan Ben
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Teaching Areas
Environmental Chemistry, Solid and Hazardous Waste Control (BSc), Solid and Hazardous Waste Management, Sustainable Development and Environmental Planning (MSc)

Research Interests
Biomass to Biofuels, Wood, Wastewater Engineering, Biological Processes, Lignin Biorefinery

Biography
Dr Leu's research interests are in developing urban biorefinery to convert sewage and lignocellulosic biomass into biofuels and valuable chemicals. Dr Leu obtained his BSc/MSc degrees from the Forestry Department (on wood processing) of National Taiwan University (1993-97). He then received MPhil/PhD from the Civil Engineering Department of UCLA (2003-09) on wastewater engineering. He lectured at UC-Riverside in 2010-11 and registered as a Professional Engineer in California in 2011. In 2011-2013, Dr Leu worked as a Postdoctoral Fellow in the USDA Forest Products Laboratory (FPL, Madison, WI), where he joined the Wood-to-Wing Project to convert forestry residues into sustainable aviation fuel. At PolyU, Dr Leu established the BioEnergy Lab and supported the development of an NMR platform for characterizing the physiochemical changes of plant cell walls structure at various conditions. He designed novel pretreatment techniques to facilitate organic waste/sewage valorization, which can be particularly applicable in supporting environmental protection and sustainable development in mega-cities like Hong Kong.

Dr Alessandro STOCCHINO

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Teaching Areas
Fluid Mechanics, Hydrology and Hydraulic

Research Interests
Mass Transport and Mixing Processes in Geophysical Flows; Coastal and Estuarine Circulation; River Hydro-Morphodynamics, Biofluid Mechanics

Biography
Dr Stocchino joined the Department of Civil and Environmental Engineering (CEE) of The Hong Kong Polytechnic University (PolyU) as an Associate Professor in August 2020. He obtained his MSc degree in Environmental Engineering from the University of Genova (Italy) in 1998. He received his PhD in Hydraulic Engineering from the University of Padua (Italy) in 2001. Prior to joining PolyU, he had nineteen years of experience as assistant and associate professor in fluid mechanics at the Civil, Chemical and Environmental Engineering Department of the University of Genova (Italy). He has published 45 papers in top peer-reviewed journals and presented more than 40 papers in international conferences in the field of environmental fluid mechanics, morphodynamics and biofluid mechanics. He had been the Program Leader of the MSc Program in Environmental Engineering at the University of Genova (Italy). The main research interests span a broad range of basic and applied fluid mechanics topics, covering river mechanics, Lagrangian mass transport in rivers and coastal environments, turbulent flow structures and human health related applications, such as human eye pathologies. In the last four years, he had been Principal Investigator of several European research projects regarding flash flood risk management and marine pollution owing to oil-spills and microplastics.

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Teaching Areas
Quantitative Method for Environmental Studies, Disaster Control and Management, Sustainable Development and Environmental Planning

Research Interests
Accident Analysis, Applications of Statistical Model for Safety Analysis, Traffic Safety, Human Factor, Driving Simulator Study, Safety Policy and Regulation

Biography
Dr Sze is currently Associate Professor at the Department of Civil and Environmental Engineering. Before joining PolyU, He was a Lecturer at the University of Canterbury in New Zealand. Dr Sze obtained both his BEng and PhD degrees from the Department of Civil Engineering of The University of Hong Kong. He specializes in traffic safety, human factors, safety policy, and applications of statistical methods. Dr Sze has over 150 research outputs, including journal publications, conference presentations and technical reports. He is currently associate editor of Accident Analysis and Prevention, IATSS Research and Transportmetrica A: Transport Science and a member of the editorial board of Safety Science, International Journal of Sustainable Transportation, Journal of Safety Research and Analytic Methods in Accident Research. Dr Sze is also a member of the Road Safety Research Committee of the Road Safety Council of Hong Kong. He received the Best Original Paper Award from Hong Kong Medical Journal in 2010 and Outstanding Health Promotion Project Award from Food and Health Bureau of Hong Kong Government in 2015.

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Teaching Areas
Water and Wastewater Treatment; Sustainable Development Strategies; Solid and Hazardous Waste Management

Research Interests
Renewable Energy Driven Clean Water Production and Wastewater Treatment, Zero-liquid-discharge Desalination and Industrial Brine Treatment, Atmospheric Water Harvesting and Its Applications to Smart Cooling and Energy Conversion, Resource Recovery from Wastewaters, Brine, and Seawater by Electrochemical and Membrane Processes

Biography
Dr Peng Wang obtained his Ph.D. from Bren School of Environmental Science and Management at University of California, Santa Barbara (UCSB) in 2008. He joined King Abdullah University of Science and Technology (KAUST) in 2009 as a founding faculty member and was promoted to full Professor at KAUST in 2019. He was the program chair of Environmental Science and Engineering at KAUST from 2013 to 2017. Dr Wang is very passionate about global water and energy sustainability and strives to develop solutions contributing to water-energy-climate nexus. He has published three academic books and about 100 peer-reviewed academic publications, including two in Nature Communications and two in Nature Sustainability. Dr Wang's research is globally visible and recognized and he is often interviewed by international radio and TV programs and newspapers. Dr Wang was the inaugural Emerging Investigator of Environmental Science: Nano (2018). He was the recipient of the Chinese-American Professors in Environmental Engineering and Science (CAPEES)/Nanova Frontier Research Award in 2020. He received the 9th the Prince Sultan bin Abdulaziz International Prize for Water (PSIPW) (in the category of Alternative Water Resources) (2020), a prestigious global award for his pioneering scientific efforts contributing to the sustainable availability of potable water and the alleviation of the escalating global problem of water scarcity. Dr Wang is an associate editor of Environmental Science & Technology (ES&T), an academic journal published by American Chemical Society (ACS).

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Teaching Areas
Water and Wastewater Treatment, Environmental Management Systems

Research Interests
Advanced Water Treatment, Membrane Separation, Aerosol Technology

Biography
Dr Jiang received his PhD degree in energy, environmental and chemical Engineering from Washington University in St. Louis, MSc in environmental sciences from Peking University and BEng in environmental engineering from Huazhong University of Science and Technology. Prior to joining PolyU, Dr Jiang worked as a Postdoctoral Research Fellow at Harvard University. His major research interests are membrane separation, aerosol technology and advanced water treatment. His research has been funded by various agencies including the RGC and NSFC. He has authored about 40 journal papers, which have attracted over 2000 citations and considerable attention. He has won a number of awards, including an Early Career Award from Hong Kong Research Grants Council, Excellence in Review Award from the journal Environmental Science and Technology, Outstanding Doctoral Dissertation Award from the Association of Environmental Engineering and Science Professors, the Graduate Student Award from the American Chemical Society and the Doctoral Research Award from Washington University in St. Louis. He serves on the editorial advisory boards of ACS Environmental Au and Chemical Engineering Journal Advances.

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Teaching Areas
Environmental Impact Assessment, Environmental Management Systems and Audit

Research Interests
Air Pollution and Human Health, Marine Pollution and Wildlife Health, Aquaculture Pollution and Food Safety

Biography
Dr Jin received his PhD in Environmental Toxicology from The University of Queensland. He has been working actively in inter-disciplinary fields of environmental chemistry, toxicology, and microbiology. His ongoing research includes air pollution and human health, airborne and foodborne transmission of antimicrobial resistance and pathogens, and pollution-induced immunosuppression in endangered marine mammals (e.g., Chinese White Dolphins). He has published 38 peer-reviewed articles in leading journals and 5 book chapters. His recent work on the toxicity of air pollution attracted the attention of Nature, where he contributed an invited comment on global disparities of air-pollution health effects. The study co-authored by him on airborne transmission of antibiotic resistance genes was recognized as one of the best papers in Environmental Science and Technology Letters in 2018. He is currently an editorial board member of Environmental Toxicology and Chemistry, a flagship journal of the Society of Environmental Toxicology and Chemistry (SETAC).

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Teaching Areas
Steel Structure Design, Structural Stability, Structural Mechanics and Analysis

Research Interests
Computational Structural Engineering, Steel Structures, Steel and Concrete Composite Structures, and Applied Research in Structural Engineering

Biography
Dr Liu obtained his PhD from CEE of the Hong Kong Polytechnic University and BEng from the Sun Yat-Sen University. He has received a Grand Award in Research in 2020, a Commendation Award in Research in 2018 by HKIE, a Grand Award in Research in 2016 by HKIE and IStructE, and an Outstanding PhD Thesis Award in 2014 by PolyU. He is an associate editor of the International Journal of Advanced Steel Construction. Prior to joining CEE, he was an Associate Professor at Sun Yat-Sen University and a visiting faculty at Bucknell University. He has co-developed several structural analysis and design software for commercial, research and educational uses, such as RCD2016 & NIDA10, and Mastan2-v5 used by several leading research groups in the US and Italy. He has developed a tapered element analysis method for the successful design of the longest single layer dome at MGM, Macau. He has over 12 years of structural engineering experience in the design of steel structures in Hong Kong and Macau, and particular expertise in complex steelwork design, composite construction design and nonlinear finite element analysis.

Department of Civil and Environmental Engineering

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Teaching Areas
Transportation and Highway Engineering, Smart Transport

Research Interests
Innovation Management and Performance Evaluations, Data-driven Multi-criterion Decision-making, Smart Transportation Management Systems, System Dynamic Modeling Supporting Public Policy Making, Urban Resilience and Analytics, Smart Cities, Pedestrian and Crowd Simulations for Smart Infrastructure and Urban Planning, Industrialized Construction

Biography
Dr Lo Jacqueline obtained her BSc (High Honor, 2014) in Civil Engineering with a minor in Mathematics from the University of Illinois at Urbana-Champaign, MSc in Structural Engineering and Geo-mechanics, and Ph.D. degree (2022) from the Center for Integrated Facility Engineering at the Stanford University. Dr Lo' s research lies at the intersection of construction engineering and emerging technology; focusing on civil and construction engineering, which aims to advance innovative solutions for the next-generation building & infrastructure systems, such as digital construction, public safety in the built environment, innovation management, and smart mobility for future cities.

Dr MA Wei
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Teaching Areas
Transportation Systems Analysis, Urban Transport Planning, Smart Transport

Research Interests
Transportation Network Modelling, Data-driven Modelling and Optimization, Machine Learning and Data Mining in Infrastructure Systems, Urban Computing, Smart Cities

Biography
Dr Ma obtained his bachelor's degrees in Civil Engineering and Mathematics from Tsinghua University, After that, he went to Carnegie Mellon University, where he obtained his Master degrees in Machine learning and Civil and Environmental Engineering, and PhD degree in Civil and Environmental Engineering. His research focuses on intersection of machine learning, data mining, and transportation network modelling, with applications for smart and sustainable mobility systems. Dr Ma's research outputs are published in either highly ranked transportation journals or top-tier machine learning conferences. Dr Ma serves as a committee member of various conferences and seminars such as Continual and Multimodal Learning for Internet of Things, International Conference on Intelligent Transportation and Vehicle Engineering, and Emerging Mobility Systems and Services Seminar Series. He has received awards for research excellence and his contributions to the area, including the 2020 Mao Yisheng Outstanding Dissertation Award, Best presentation award at the Young Professionals Lightning Talk Session of the 23rd COTA Winter Symposium, and a Best Paper Award (theoretical track) at the INFORMS Data Mining and Decision Analytics Workshop.

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Teaching Areas
Hydraulics & Hydrology, Wind Engineering

Research Interests
Coastal and Offshore Disaster Mitigation, Ocean Renewable Technology

Biography
Dr Wang received his Ph.D. in Hydraulic Engineering at City University of London in 2015. Prior to joining PolyU, he has worked as a Research Fellow at City University of London and National University of Singapore, and as an Associate Professor at Ocean University of China. Dr Wang is an expert in developing numerical tools and their applications for modelling oceanic disasters such as storm surge, tsunamis, and rogue waves to understand the mechanisms. His research interests cover a broad range of topics including nonlinear wave mechanics, wave-structure interactions, coastal flooding, ocean disaster mitigation and ocean renewable technologies, etc.

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Teaching Areas
Rock Engineering

Research Interests
Laboratory Rock Mechanics and Rock Physics; Machine Learning for Rock Mechanics and Geophysics Studies; Rock Joint Surface Roughness and Shear Behavior

Biography
Dr Qi Zhao obtained his PhD degree at the University of Toronto in Civil & Mineral Engineering. His PhD dissertation was awarded the Leopold Müller Award by the Austrian Society for Geomechanics and the Dr N.G.W. Cook Ph.D. Dissertation Award by the American Rock Mechanics Association (ARMA). He is an ARMA Future leader (class 2021). His research interests cover several aspects of rock mechanics and geophysics, including in situ 4D rock physics experiments under X-ray micro-CT; application of machine learning to rock mechanics and geophysics problems; and shear behavior of rock discontinuities.

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Teaching Areas
Soil and Rock Engineering, Engineering Analysis and Computation

Research Interests
Static and Cyclic Behavior of Unsaturated Soil, Thermal Effects on Soil Behaviour, Constitutive Modelling of Soil, Geo-energy Engineering, Geo-environmental Engineering, High-speed Railway Embankment

Biography
Dr Zhou joined the Department of Civil and Environmental Engineering (CEE) of PolyU as an Assistant Professor in December 2018. He received his bachelor's degree in hydraulic engineering from Tsinghua University in 2009, and his PhD degree in geotechnical engineering from the Hong Kong University of Science and Technology (HKUST) in 2014. During 2014-2018, he worked in HKUST as a Visiting/Research Assistant Professor. His main research interests include constitutive modelling and experimental investigation of cyclic thermo-hydro-mechanical behaviour of saturated and unsaturated soils, with applications to geo-energy problems including energy pile and methane hydrate, geo-environmental problems including landfill cover and high-speed railway embankment. Dr Zhou has published more than 50 SCI papers, mostly in leading international journals. He was awarded funding from China's Excellent Young Scientists Fund and received the Bright Spark Lecture award of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). He is the technical committee member of Laboratory Testing (TC 101) and Transportation Geotechnics (TC202) of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), and editorial board member of Canadian Geotechnical Journal.

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Teaching Areas
Vibration control; Seismic Design of Building Structures

Research Interests
Structural Health Monitoring; Structural Dynamics; Vibration Measurement; Vibration Serviceability; Vibration Control; Energy Harvesting; Data-driven Modelling; Machine Learning; Vision-based Sensing and Image Processing; Finite Element Modelling and Model Updating

Biography
Dr Wai Kei (Vincent) Ao graduated from the National Taiwan University (NTU) with MSc and undergraduate qualifications in Civil and Structural Engineering and Civil Engineering. He joined the Vibration Engineering Section (VES) at the University of Sheffield (UoS) and the University of Exeter (UoE) in 2012 and 2013, respectively, and studied for a PhD and graduated in 2017 with a research topic on "Electromagnetic damping for control of vibration in civil structures". After the PhD, he worked at UoE as a Graduate Research Assistant. In 2018, he was awarded a postdoctoral research fellowship on advanced sensors and modelling for next-generation bridge management at Queen's University Belfast (QUB). In 2019, he was awarded a new postdoctoral research fellowship at the University of Exeter. The key aim of the UoE job corresponded to two project grants: Resilient integrated-coupled FOW platform design methodology (ResIn) and dynamic response of tall timber buildings under service load (DynaTTB). These works focused on the dynamic behaviour of offshore structures and the dynamic testing of tall timber buildings around the UK and Europe. From 2022 until the present, he is awarded a Research Assistant Professor (RAP) position at The Hong Kong Polytechnic University (PolyU) in Civil and Environmental Engineering (CEE). His ongoing research includes passive, semi-active and active vibration control, vibration serviceability, structural health monitoring, vision-sensing system, and machine learning paradigms for applications to civil structures and railway systems.

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Teaching Areas
Structural Engineering; Construction Technology

Research Interests
Infrastructure Applications of Fiber-Reinforced; Polymer Composites; Hybrid FRP-Concrete-Steel Composite Structures; Nonlinear Finite Element Analysis

Biography
Dr Chan received his BEng (Hons) degree in 2015 and Ph.D degree in 2020, both from the University of Wollongong, Australia. He then joined PolyU as a Postdoctoral Fellow from 2020 to 2022. Dr Chan's research focus is on FRP composite, FRP-steel-concrete composite structures, non-linear finite element modelling and constitutive models for rubber concrete. During his Ph.D study, Dr Chan examined the structural behaviour of composite columns and developed theoretical models of various levels of complexity for different purposes, ranging from three-dimensional finite element models of novel composite columns to one-dimensional design-oriented models of concrete. His Ph.D dissertation was awarded the "Examiners' Commendation for Outstanding Thesis", and he was the sole awardee of 2020 in the School of Civil, Mining and Environmental Engineering.

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Teaching Areas
Global Climate Change and Society, Environmental Chemistry, Introduction to Environmental Science

Research Interests
Atmospheric Chemistry, Air-surface Interaction, Tropospheric Sulfur Cycle, Reactive Halogen and Nitrogen Chemistry, Wintertime Air Quality, Blowing Snow

Biography
Dr Chen received his BSc degree in Atmospheric Sciences from the Sun Yat-sen University (2011), MSc degree in Meteorology, Physical Oceanography and Climate from Utrecht University (2013), and PhD degree in Atmospheric Sciences from the University of Washington, Seattle (2017). Before joining The Hong Kong Polytechnic University, he was a postdoctoral research fellow at University of Michigan, Ann Arbor (2018-2020). His research focuses on tropospheric sulfur, halogen, and nitrogen chemistry, and the impacts of aerosols and snowpack. Dr Chen has used various techniques in his previous research, including global modeling (GEOS-Chem), laboratory measurement (isotope-ratio mass spectrometry), and field campaign (chemical ionization mass spectrometry). He was a selected participant for the Atmospheric Chemistry Colloquium for Emerging Senior Scientists (ACCESS XV) (2019), and previously received the HHMI Teaching Postdoctoral Fellowship from University of Michigan (2018), Utrecht Excellence Scholarship and Buys Ballot Graduate Scholarship from Utrecht University (2011-2013), and National Encouraging Scholarship from the Ministry of Education of China (2007-2010). He has published 13 top peer-reviewed papers and is an active reviewer for academic journals.

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Teaching Areas
Advanced Geotechnical Design

Research Interests
Soil Dynamics, Sustainable Ground Improvement Techniques, Soil-pile Interaction, Geoenvironmental Engineering

Biography
Dr Chen received his bachelor's degree in Civil Engineering from Huazhong University of Science and Technology in 2013 and PhD degree in Geotechnical Engineering from The Hong Kong Polytechnic University in 2019. He has been working actively in the research of micro-/macro- characterization of soft and granular soils, application of sustainable materials in soft soil ground improvement, and physical and numerical modelling of soil-pile interaction. He was awarded Fugro Prize from HKIE in 2022. He is serving as the corresponding member in the technical committee (TC101) of ISSMGE and guest editors for three special issues. So far, he has co-authored more than 30 peer-reviewed SCI journal papers and served as reviewer for 17 leading journals. He secured one General Research Fund as PI and several other research funds as PI/Co-I. Recently, a prototype field trial of turning Hong Kong local marine deposits into competent fill materials in land reclamation using vacuum preloading method has been successfully completed, with the concerted efforts of CEDD, AECOM, and BuildKing/Samsung C&T JV.

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Teaching Areas
Wind Engineering

Research Interests
Drag Reduction of High-speed Trains; Mitigation of Crosswind Effects on High-speed Trains; High-speed Train/Tunnel Aerodynamic Effects; Vehicle System Dynamics; Physics-informed Machine Learning in Aerodynamics

Biography
Dr Zhengwei Chen obtained his BEng in Traffic Equipment & Information Engineering from Central South University in June 2014 and he got his PhD related to a research topic of Train Aerodynamics and Traffic Safety from Central South University in January 2021. During 2018-2020, Dr Chen studied in University of Birmingham as a visiting PhD student. Before joining PolyU as a Research Assistant Professor, Dr Chen worked as a Postdoctoral Fellow at PolyU from 2021 to 2022. Dr Chen's research interests include drag reduction of high-speed trains, mitigation of crosswind effects on high-speed trains, high-speed train/tunnel aerodynamic effects, vehicle system dynamics, rail transit safety and environment, and physics-informed machine learning in aerodynamics.

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Teaching Areas
Environmental Science

Research Interests
Environmental Biogeochemistry, Toxicology, and Microbiology

Biography
Dr Tangtian He obtained his M.Phil. degree (2011) in Marine Biology from Shantou University and got his Ph.D. degree (2017) in Environmental Science from City University of Hong Kong. During 2014 to 2016, Dr He studied the ecotoxicological effects of organic ultraviolet filters and sunscreen products on reef-building corals at National Museum of Marine Biology and Aquarium, Taiwan, where he gained expertise in protection and conservation of threatened marine species. Before joining PolyU as a Research Assistant Professor, Dr He worked as a Postdoctoral Research Fellow at PolyU from 2018 to 2022. Dr He has been working actively in the inter-disciplinary research fields between environmental biogeochemistry, toxicology, and microbiology. His ongoing research includes natural and anthropogenic origins of antimicrobial resistance, airborne transmission of antimicrobial resistance and pathogens, phage-host interaction on antimicrobial resistance and human health, marine pollution and coral reef degradation, and water-air interface and pathogenic aerosols.

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Teaching Areas
Structural Steel Design, Structural Fire Engineering

Research Interests
High Performance Steel Materials, Constitutive Models, Fracture Mechanics, Cold-formed Steel Structures, Bamboo Structures; Structural Fire Engineering, and Computational Fluid Dynamics

Biography
Dr HO is Deputy Executive Secretary of the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch). He obtained his first degree in Civil and Structural Engineering in 2000, and his doctoral degree in Structural Engineering in 2005, both at the Department of Civil and Structural Engineering of the Hong Kong Polytechnic University. Since 2012, Dr Ho has developed expertise in theoretical and numerical modelling on structural behavior of building structures and tunnels under fires. Moreover, he has proposed practical remedial works on structural repairs and strengthening of fire-damaged structures which have been adopted in practice. More recently, Dr Ho has diversified his research interests into full deformation range constitutive models of steels and constructional metals under both monotonic and cyclic actions, fracture mechanics, and Artificial Intelligence assisted structural engineering design. He is also engaged in various scholarly activities in professional bodies of the industry, including Hong Kong Constructional Metal Structures Association, The Institute of Cold-Formed Metal Structures, and Committee of Building Structures, the Chinese Confederation of Roll Forming Industry. Dr Ho has published many conference papers, journal papers, as well as technical reports. He has given lectures and presentations in technical seminars on various research and development topics.

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Teaching Areas
Structural Steel Design

Research Interests
High-performance Steel Structures, Cold-formed Steel Structures

Biography
Dr Yifei HU received his BEng degree from Tongji University in 2012, and his MSc degree from the Hong Kong Polytechnic University in 2013. He worked as a graduate structural engineer for an international engineering consulting firm in Hong Kong from 2013 to 2014. After he received his PhD degree from the Hong Kong Polytechnic University in 2019, Dr Hu joined the Chinese National Engineering Research Centre for Steel Construction (Hong Kong Branch) as a Postdoctoral Fellow. Dr Hu's research areas include high performance steel structures and cold-formed steel tubular structures. His specialties include non-linear finite element modelling of manufacturing processes, experimental and numerical investigations into cold-formed high strength steel tubular joints, practical structural design and connection design in steel modular buildings.

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Teaching Areas
Reinforced Concrete Construction

Research Interests
Molecular Dynamics; Cement; Geopolymer; Nano-engineered Materials

Biography
Dr KAI obtained his BSc degree from Southeast University in China in 2014 and a PhD degree from City University of Hong Kong in 2020. He joined PolyU as a Postdoctoral Fellow in Oct 2020. Dr KAI is a researcher in the field of cement and geopolymer-based composites. He employed molecular dynamics (MD) simulation to study the properties of eco-friendly and high-performance composites, including carbon nanotube (CNT) and graphene reinforced composites, industry wastes (including nuclear waste and heavy metal waste) and supplementary cementing materials (like fly ash) modified composites. His experimental studies focused on the mechanical, dynamical, thermal and damping properties of cementitious composites (including engineered cementitious composite (ECC) and CNT reinforced cementitious composites).

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Teaching Areas
Fluid Mechanics, Open Channel Flow, Numerical Methods, Computational Hydraulics, Finite Element Methods

Research Interests
Transient Flow in Pipelines and Pipe Networks, Fluid-structure Interaction, Defect Detection, Non-Newtonian Fluids, Viscoelasticity, Structural Dynamics and Statistical Analysis of Pipes, and Hemodynamics

Biography
Dr Keramat joined the Department of Civil and Environmental Engineering (CEE) of The Hong Kong Polytechnic University (PolyU) as a Research Assistant Professor in December 2020. He obtained MSc and PhD degrees (both with honors track) in Civil Engineering, majored in Hydraulic Structures, in 2006 and 2011 from Shahid Chamran University and Shahrood University of Technology, respectively. Following his graduation and prior to joining the CEE of PolyU, he was affiliated as a faculty member in Civil Engineering Department of Jundi-Shapur University of Technology, during which he taught several undergraduate and postgraduate courses and (co-) supervised/advised 14 MSc and 5 PhD students. He was a visiting scholar at Eindhoven University of Technology (2009-2010), visiting faculty member at the Tokyo Institute of Technology (2014), Research Associate at the Hong Kong University of Science and Technology (2016-2017) and visiting faculty member in the University of Alberta (2019-2020). He is an active researcher in modeling fluids, pipe structures, haemodynamics and their computational analysis. His main research interests include wave propagation, fluid-structure interaction, column separation, defect detection, non-Newtonian fluids, viscoelasticity and buckling in pipelines and pipe networks as well as their mathematical modelling and statistical analysis. He has published over 30 papers in top peer-reviewed journals and has served as reviewer to numerous professional water, structural and numerical-related journals.

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Teaching Areas
Design Project for Environmental Engineers, Solid and Hazardous Waste Management

Research Interests
Biological Wastewater Treatment Processes, Environmental Microbiology, Bioinformatics

Biography
Dr Leng's research focuses on microbial process and technology for the degradation of recalcitrant environmental contaminants and synthesis of biorenewable products from waste streams. His specialties include applying molecular biology, bioinformatics and machine learning tools to discover complex microbial processes in both environmental and engineered ecosystems and further improve our biotechnology for achieving environmental sustainability.

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Teaching Areas
Analytical and Numerical Methods in Geotechnical Engineering

Research Interests
Multiscale Modeling of Granular Media; High-performance Computing; Meshless Method

Biography
Dr Liang Weijian obtained his B.Eng. (Hons) in Theoretical and Applied Mechanics from Sun Yat-Sen University (SYSU) in 2016 and earned his Ph.D. in Civil Engineering from the Hong Kong University of Science and Technology (HKUST) in 2020. During his Ph.D. study, he finished a half-year research exchange at UC Berkeley. Prior to joining PolyU, he was a Postdoctoral Fellow at HKUST. Dr Liang's current research interest focuses on developing high-performance multi-scale and multi-physics approaches for modeling granular material.

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Teaching Areas
Design of Steel Structures

Research Interests
FRP-concrete-steel Composite Structures; FRP Structures; Connections of CFSTs

Biography
Dr Li received his bachelor, master and PhD degrees from Huazhong University of Science and Technology (2011), Tongji University (2014) and Monash University (2019). He joined the Hong Kong Polytechnic University in April 2022. Before joining PolyU, he worked as a Postdoctoral Fellow at the University of New South Wales (2019-2022). Dr Li has published 20+ peer-reviewed journal papers and his H-index is 14 (Scopus). His research interests include FRP-concrete-steel composite structures, hybrid beam-to-column joints, steel structures and floating structures.

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Teaching Areas
Soil Behavior and Geotechnical Engineering, Soil Mechanics, Advanced Geotechnical Design

Research Interests
Experimental study, Constitutive Modelling, Numerical Modelling, Unsaturated Soils

Biography
Dr Liu obtained his Ph.D. from The Hong Kong Polytechnic University (PolyU) in 2021. He graduated with his Master's degree from City University of Hong Kong in 2014 and earned his dual Bachelor's degrees in Wuhan University and China University of Geosciences (Wuhan) in 2009. He worked for six years in the construction industry before switching to academia. He worked in CCCC-FHDI from 2009 to 2013, with a focus on site investigation and laboratory tests of soil and rock. Then he worked with WSP from 2014 to 2016, where he mainly focused on design and consultancy. He has been conducting research in PolyU since 2016 and has one-year experience as a Postdoctoral Fellow after graduation. Dr Liu's main research interests include development of apparatus, experimental study, constitutive modelling, numerical modelling, and unsaturated soils. He has published over 13 SCI journal papers, with one paper reported as an ESI highly cited paper in 2021. He has been invited as a reviewer for over 16 SCI journals, such as Géotechnique, Journal of Geotechnical and Geoenvironmental Engineering, International Journal of Mining Science and Technology, etc. He is currently a member of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), a member of the Hong Kong Geotechnical Society (HKGES), and an associate member of the American Society of Civil Engineers (ASCE).

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Teaching Areas
Civil Engineering

Research Interests
Low-carbon Construction and Building Materials

Biography
Dr Shen Peiliang obtained his B.S. in Materials Science and Engineering from Wuhan University of Technology (2010), and got his Ph.D. degree (2018) in Mechanics and Engineering from Wuhan University of Technology. Before joining PolyU as a Research Assistant Professor, Dr Shen worked as a Postdoctoral Research Fellow at PolyU from 2019 to 2022. Dr Shen's main research interests include development and characterization of sustainable building materials, ultra-high performance concrete and its structural application, CO2 capture and sequestration and waste recycling and management.

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Research Interests
Air Pollution and Dust Control, Microbiology Technique for Sand Solidification and Crack Repair, Marine Pollution and Concrete Structure

Biography
Dr Xiaohao Sun received his Ph.D. degree in 2019 from Southeast University, China. Dr Sun was a Postdoctoral Research Fellow and then a Research Assistant Professor at Southeast University from 2019 to 2021. Before joining PolyU as a Research Assistant Professor, Dr Sun worked as a Postdoctoral Research Fellow at PolyU from 2021 to 2022. Dr Sun's main research interests include 1. Microbially induced carbonate precipitation (MICP) for concrete crack repair, 2. Bio-cementation for dust and sandstorm control, 3. Data-driven models in civil engineering, and 4. Microbiologically influenced corrosion in marine environments. He is also a Member of Jiangsu Province Comprehensive Transportation Society and the Youth Editor of the journal 'The Innovation.'

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Teaching Areas
Soil Behavior and Geotechnical Engineering, Soil Mechanics and Rock Mechanics

Research Interests
Development and Application of Optic Fiber Sensing Technology, Debris Flow, Rockfall, Development of Smart Monitoring System

Biography
Dr TAN obtained his BEng and MPhil in Geotechnical Engineering from the China University of Geosciences in 2011 and 2014. Afterwards, he was awarded a PhD by the Hong Kong Polytechnic University in 2019. He has been working actively in the research of natural hazards' mitigation. He was selected to give an oral presentation at the 39th Annual Seminar 2019 of HKIE Geotechnical Division. He has received the 2019 Ringo Yu Prize for Best PhD Thesis in Geotechnical Studies. He has published more than 14 journal papers in high-ranking international journals (9 first/corresponding authorship) and served as a reviewer in top journals in the related research area including Landslides, JGGE, and Acta Geotechnica. He is currently a member of the Debris Flow and Steep Creek Hazards Mitigation Committee of the Association of Geohazard Professionals (AGHP, United States), and a member of the Hong Kong Geotechnical Society (HKGES), the International Association for Computer Methods and Advances in Geomechanics (IACMAG), and the Chinese Society for Rock Mechanics & Engineering. Currently, he focuses on the development of smart monitoring system for geotechnical structures and slopes based on the innovative optical fiber sensing technology. In collaboration with the Hong Kong government, an unattended monitoring system has been established for automatic monitoring and early warning of a historical tree-colonized masonry retaining wall.

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Teaching Areas
Indoor Air Quality

Research Interests
Aerosol, Droplet, Fluid Dynamics, Infection Control, Indoor Air Quality

Biography
Dr Wang Cunteng received his BEng., MEng., and PhD degrees from Zhengzhou University in 2014, Harbin Institute of Technology in 2017, and The Hong Kong University of Science and Technology in 2020, respectively. He then worked as a Research Associate at The University of Hong Kong from 2020 to 2022. Dr Wang's research focuses on the aerosol science, fluid dynamics, and infectious disease transmission (i.e., Covid-19). Dr Wang has rich experience in aerosol characterization, dispersion, deposition, and resuspension. His research has been invited for a lecture by American Association for Aerosol Research (AAAR) and was highlighted as a cover page in Journal of Aerosol Science. He was involved in the collaborated with Prince Philip Dental Hospital (PPDH) to develop control measures in order to curb SARS-CoV-2 virus spread in dental hospital.

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Research Interests
Wind Engineering, Turbulent Flow, Reduced-order Modeling, Fluid-structure Interaction

Biography
Dr Wang Fei received his BSc in Applied Physics from Southeast University (2009), MSc in Civil Engineering from Tongji University (2012), and PhD in Water and Environmental Engineering from the University of Hong Kong (2020). Before joining the Hong Kong Polytechnic University as a Research Assistant Professor, Dr Wang worked as a Postdoctoral Fellow at HKU. His research interests primarily focus on the characterization, reconstruction, and prediction of spatiotemporal turbulent winds as well as their implications in practice. Currently, it includes physics-informed reduced-order modeling, bluff-body wake flow and pollutant dispersion, and coupled mesoscale-microscale modeling.

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Teaching Areas
Air Pollution Control

Research Interests
Air Pollution; Atmospheric Chemistry; Mass Spectrometry Analysis; Secondary Organic Aerosol; Source Apportionment

Biography
Dr Wang Meng obtained her Ph.D. degree (2020) in Environmental Science from the Institute of Earth Environment, Chinese Academy of Sciences. Before joining PolyU as a Research Assistant Professor, Dr Wang worked as Postdoctoral Research Fellow at PolyU from 2021 to 2022. Dr Wang's current research interest focuses on 1. Signatures and spatiotemporal variation of organic tracers in urban and rural areas; 2. Characterization and source apportionment of organic compounds in PM2.5 based on different mass spectrometry methods (e.g., AMS; CIMS; EESI; GC-MS, HPLS-MS); 3. Machine learning techniques to decouple the effect of meteorology and evaluate the effectiveness of air pollution control policies.

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Teaching Areas
Granular Materials, Particle Breakage, Soil Behaviors, Discrete Element Method

Research Interests
Granular Materials, Particle Breakage, Soil Behaviors, Discrete Element Method

Biography
Dr Pei WANG obtained his PhD in Geotechnical Engineering from Georgia Institute of Technology in the USA in May 2019. He received his MEng in Civil Engineering from Tongji University and BEng in Highway Engineering from Chang'an University. His work focuses on the multi-scale computational modeling of (cemented) granular materials, micro-mechanical analysis of soil behavior, experimental and numerical analysis of particle breakage with XCT and DEM, soil-structure interface and size effect of granular materials. Dr Wang participated in several research projects from the NSF in the USA and the RGC in Hong Kong. In addition, he has published more than 10 peer-reviewed papers in top journals.

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Teaching Areas
Structural Analysis, Structural Dynamics

Research Interests
Structural Health Monitoring, Structural Dynamics and Control, Interaction of Train-track-bridge System, Dynamic Analysis of High-speed Railway and Maglev, Vision-based Deep Learning, Monitoring and Control in Rail Engineering

Biography
Dr Su-Mei Wang obtained her BEng (2013) in Civil Engineering from Hebei University and PhD (2018) in Civil Engineering from Zhejiang University. She worked as a Postdoctoral Fellow at PolyU from 2019 to 2021. Dr Wang's main research interests include structural health monitoring, structural dynamics and control, interaction of train-track-bridge system, dynamic analysis of high-speed railway and maglev, vision-based deep learning, and monitoring and control in rail engineering. She has published more than 10 refereed journal papers in structural and mechanical areas.

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Teaching Areas
Geotechnical Engineering, Soil Mechanics

Research Interests
Discrete Element Method, Granular Material, Deep Learning, Automation in Construction, Digital Twin

Biography
Dr Wang obtained his Bachelor's degree in civil engineering from Central South University (CSU) in 2014, a Master's degree in geotechnical engineering from the University of Hong Kong (HKU) in 2015, and a PhD degree in road and railway engineering from CSU in 2020. He was a visiting postgraduate at the Hong Kong University of Science and Technology (HKUST) in 2018 and at the Hong Kong Polytechnic University (PolyU) in 2019. He was a Postdoctoral Fellow of the Department of Civil and Environmental Engineering at PolyU before he became a Research Assistant Professor of the same department in September 2021. His research interests include the discrete element method, granular material, deep learning, automation in construction, digital twin, etc., with a strong focus on the discrete modeling of arbitrarily irregular shaped granular materials, and the macroscopic and microscopic analysis of mechanical responses and topology evolution. He has published 20 SCI journal papers and has served as a reviewer for several SCI journals, including Construction and Building Materials, Powder Technology, Advanced Powder Technology, Computers and Geotechnics, Particuology, Computational Particle Mechanics, etc.

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Teaching Areas
Structural Analysis

Research Interests
Vibration-based Structural Damage Detection, Bayesian Inference, Signal Processing, Statistical Learning, and Probabilistic Machine Learning

Biography
Dr WANG Xiaoyou obtained her B.S. Degree (2015) from Huazhong University of Science and Technology, M.S. degree (2018) from Tongji University, and Ph.D. degree (2021) from The Hong Kong Polytechnic University. Prior to joining PolyU as a Research Assistant Professor, Dr Wang worked as a Postdoctoral Research Fellow at PolyU after graduation. Dr Wang's current research interests include vibration-based structural damage detection, Bayesian inference, signal processing, statistical learning, and probabilistic machine learning.

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Research Interests
Structural Health Monitoring; Structural Dynamics; Bayesian Inference

Biography
Dr Wang received his PhD degree in Structural Engineering from the Hong Kong Polytechnic University in 2017. After graduation, he joined the Hong Kong Branch of National Engineering Research Center on Rail Transit Electrification and Automation (CNERC-Rail) as a Research Associate, then a Postdoctoral Fellow and Research Fellow. Dr Wang's research focuses on the detection of structural damage and safety assessment of civil infrastructure under the effects of structural deterioration, climate change and hazards to aid the development of the infrastructure systems. Recent applications focus on long-span bridges, high-rise buildings and high-speed rail. He has been involved in a number of research projects and consultancy projects as a co-investigator.

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Teaching Areas
Air Pollution Studies

Research Interests
Photochemical Air Pollution – Monitoring, Simulation and Assessment, Numerical Simulation of Photochemical Pollution and Radical Chemistry

Biography
Dr WANG Yu obtained his B.S. and M.S. in Applied Chemistry from Sun Yat-sen University (2012), and got his Ph.D. degree (2019) in Environmental Engineering from PolyU. Before joining PolyU as a Research Assistant Professor, he worked as a joint Postdoctoral Research Fellow at Jinan University and PolyU from 2019 to 2021. Dr WANG's main research interests include: 1. Characters and formation mechanisms of photochemical air pollution in urban, rural, oceanic, mountainous and forested areas; 2. Spatiotemporal variations, photochemical behaviors and long-term trend of air pollutants; 3. Chemical compositions of VOCs, source apportionment, chemical contribution to O3 formation; 4. Evaluation on observation-oriented O3 control strategies; 5. Improvement and application of gas phase chemical box model (i.e. PBM-MCM/CB05 and PTM-MCM); 6. Near-explicit numerical simulation of photochemistry and radical chemistry process.

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Teaching Areas
Advanced Geotechnical Design, Soil Behaviours and Geotechnical Engineering

Research Interests
Soft Soil Engineering, Ground Improvement Techniques, Smart Monitoring

Biography
Dr Peichen Wu obtained his bachelor's degree in Civil Engineering from Huazhong University of Science and Technology and PhD degree in Geotechnical Engineering from The Hong Kong Polytechnic University. He won the Best PhD thesis "Ringo Yu" Award offered by the Hong Kong Institution of Engineers. His research interests include physical and numerical modelling of marine deposits, ground improvement techniques on soft soils, geosynthetics, application of optical sensing technologies in geotechnical engineering, as well as field experiments on marine reclamations.

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Teaching Areas
Structural Analysis

Research Interests
High-performance Concrete Structures, Structural Application of Fibre-reinforced Polymer (FRP) Composites and Ultra-high-performance Concrete (UHPC), Numerical Modelling of FRP-Strengthened/Reinforced Concrete Structures, Structural Health Monitoring

Biography
Dr XIANG Yu is currently a Research Assistant Professor in the Department of Civil and Environmental Engineering at the Hong Kong Polytechnic University (PolyU). Dr XIANG obtained his BEng degree in 2010 and PhD degree in 2017, both from Hunan University, China. After graduation, Dr XIANG joined PolyU and successively worked as a Research Associate, Postdoctoral Fellow and then Research Fellow from 2017 to 2022. His research interests include high-performance structures enabled by the use of fibre-reinforced polymer (FRP) composites and ultra-high-performance concrete (UHPC), numerical modelling of FRP-strengthened/reinforced concrete structures, and smart sensors for structural health monitoring. He has published 23 journal papers including 18 SCI-indexed journal papers. His publications have received a total of 249 citations with an h-index of 8 in Scopus. He has served as a reviewer for a number of SCI journals, including ASCE Journal of Composites for Construction, Advances of Structural Engineering and Construction and Building Materials.

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Teaching Areas
Geotechnical Design

Research Interests
Artificial Intelligence; Smart Construction of Shield Tunnelling; Deep Learning-based Constitutive Modelling; AI-aided Numerical Method

Biography
Dr Ning Zhang is a Research Assistant Professor in the Department of Civil and Environmental Engineering at the Hong Kong Polytechnic University. He obtained B.Eng. degree from Southeast University in 2013 and Ph.D. degree from Shanghai Jiao Tong University in 2019. he also visited RMIT University, Australia, from 2017 to 2018. He has been focusing on the inter-disciplinary research fields between artificial intelligence and geotechnical engineering. His ongoing research includes deep learning-based constitutive modelling, smart construction of shield tunnelling, and improvement in deep learning methods in geotechnical engineering. Dr Zhang proposed a series of improved algorithms for the applications of deep learning methods in constitutive modelling and shield tunnelling. He co-authored over 25 papers published in peer-reviewed journals with a Google H-index of 14. He is also the corresponding member of the Chinese Subsociety for Intelligent Monitoring in Geoengineering (since 2020).

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Teaching Areas
Solid Mechanics; Mechanics and Finite Elements

Research Interests
Poroelasticity; Double Porosity Media; Computational Poromechanics

Biography
Dr Qi ZHANG obtained his B.Eng. degree from Tongji University in 2016 and his Ph.D. degree from Stanford University in 2021. Before joining PolyU as a Research Assistant Professor, he worked as a RGC Postdoctoral Research Fellow at PolyU from 2021 to 2022. He specializes in computational geomechanics of double porosity and transverse isotropy. His ongoing research includes THM processes in methane hydrate-bearing formations, fractured shale reservoirs, and finite-strain elastoplasticity in geomaterials. He has participated in several research projects, including the NSF and DoE in the USA and the RGC-GRF in Hong Kong. In addition, he has published around 20 peer-reviewed papers.

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Teaching Areas
Construction Materials

Research Interests
Sustainable Construction Materials, Waste Recycling and Management, Concrete Technology

Biography
Dr Shipeng Zhang obtained his BSc (2013) in Civil Engineering from University of Minnesota, MEng (2016) and PhD (2020) in Civil Engineering from McGill University. Prior to joining the Hong Kong Polytechnic University as a Research Assistant Professor, he worked as a Postdoctoral Fellow at McGill University from 2020 to 2021. Dr Zhang's primary research interests include development and characterization of sustainable construction materials, waste recycling and management, carbon sequestration in concrete, and concrete durability analysis.

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Teaching Areas
Geodesy, Surveying, Positioning Technology

Research Interests
GNSS Applications on Transportation, Kinematic GPS, System Integration, GNSS Performance Evaluation, GPS Software Receiver, Regional GPS Network, Vehicle and Personal Navigation Systems, and Wireless Sensor Network

Biography
Prof. Chen joined The Hong Kong Polytechnic University in 2000. He was awarded a BSc by the Chinese University of Science and Technology in 1982, a MSc by the Institute of Geodesy and Geophysics, the Chinese Academy of Sciences in 1985, and a PhD from the University of Newcastle upon Tyne in 1992. He has been actively working on GNSS-related research for over 30 years and has been working on a large number of research projects funded by universities, governments, and industries. His main research interests are geodesy and geodynamics, seamless positioning technologies, indoor positioning, navigation and integrity, GNSS positioning and applications, system integration, GNSS performance evaluation, regional GPS network, wireless sensor network positioning, and airborne Lidar applications. He has published over 300 technical papers in different journals and international conferences, submitted over 30 technical reports to various organizations, granted or filed more than 10 patents.

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Teaching Areas
Engineering Surveying, Least Squares Adjustment, Survey Data Analysis

Research Interests
Satellite Positioning Technologies (such as GPS), Synthetic Aperture Radar (SAR) and Interferometric Synthetic Aperture Radar (InSAR), Technologies for Ground Deformation and Structural Health Monitoring, Land and Space Development

Biography
Prof. Ding obtained his BEng from Central South University, China in 1983 and his PhD from the University of Sydney, Australia in 1993. He lectured at the Northeastern University in China and Curtin University in Australia respectively before joining The Hong Kong Polytechnic University in 1996. Prof. Ding has been working on technologies for monitoring ground and structural deformations and geohazards, especially GNSS and InSAR technologies. He is also interested in developing new land and optimal use of exisiting land and space for dense cities. He has attracted a significant amount of research funding and published extensively in these areas. Prof. Ding is a Fellow of the International Association of Geodesy (IAG), Fellow of several professional institutions, co-editor-in-chief of Remote Sensing Applications: Society and Environment, an editor of the Journal of Spatial Science and an editorial member of several academic journals.

Prof. SHI Wenzhong John
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Teaching Areas
Geographical Information System and Science

Research Interests
Urban Informatics for Smart Cities, Geographic Information Science and Remote Sensing, Artificial-intelligence-based Object Recognition and Change Detection from Satellite Imagery, Intelligent Analytics and Quality Control for Spatial Data, Mobile Mapping and 3-D Modelling Based on LiDAR and Imagery, 3-D GIS Models

Biography
Professor John Shi is currently the Director of PolyU-Shenzhen Technology and Innovation Research Institute (Futian), Director of Otto Poon Charitable Foundation Smart Cities Research Institute of PolyU, Chair Professor in Geographic Information Science and Remote Sensing, and Director of Joint Research Laboratory on Spatial Information of PolyU and Wuhan University. He is Academician of International Eurasian Academy of Sciences and Fellow of Academy of Social Sciences (UK). He earned his doctoral degree from University of Osnabruck in Vechta, Germany in 1994. He is a Fellow of Royal Institution of Chartered Surveyors and Hong Kong Institute of Surveyors, Professor Shi also serves as President of International Society for Urban Informatics and Editor-in-Chief of International Journal Urban Informatics. He has published over 300 research articles in journals indexed by Web of Science and 20 books. He is among the worldly top 2% cited researchers according to the standardized citation indicators published by Elsevier BV and scholar in Stanford University. He has 36 patents grants. He received a Natural Science Award (China's highest award for fundamental research) in 2007, China's Science and Technology Progress Award in Surveying and Mapping (Grand Award) in 2017, Wang Zhizhuo Award from International Society of Photogrammetry and Remote Sensing in 2012, and an ESRI Award for Best Scientific Paper in GIS by American Society of Photogrammetry and Remote Sensing in 2006. He has been a principal investigator of a research program under the National Key R&D Program, funded by the Ministry of Science and Technology of China; a project supported by the Key Program of the National Natural Science Foundation of China; and projects supported by the Innovation and Technology Fund, Hong Kong Government. Prof. Shi's current research interests include urban informatics for Smart Cities, GISci and remote sensing, intelligent analytics and quality control for spatial big data, artificial-intelligence-based object extraction and change detection from satellite imagery, and mobile mapping and 3-D modelling based on LiDAR and remote sensing imagery. He has published more than 220 research articles that are indexed by Science Citation Index (SCI) and 15 books. Prof. Shi served as President of Commission II for International Society for Photogrammetry and Remote Sensing (2008-2012) and President for the Hong Kong Geographic Information System Association (2001-2003). He also serves as an editorial board member for multiple international journals.

Prof. WENG Qihao
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Teaching Areas
Remote Sensing, Image Science, Geographic Information Science, Environmental Modeling, Urbanization, Earth System Science

Research Interests
Remote Sensing, Image Science, Geospatial Artificial Intelligence, Geospatial Computer Vision, and Geospatial Big Data, with Applications in Urbanization, Sustainability, Coastal Environments and Ecosystems, and Global Environmental Change

Biography
Prof. Weng, a Foreign Member of the Academy of Europe (Academia Europaea), and a Fellow of IEEE, AAAS, ASPRS, and AAIA, is a Chair Professor at the Hong Kong Polytechnic University, and worked as the Director of the Center for Urban and Environmental Change and a Professor of Geography at Indiana State University, 2001-2021, and as a Senior Fellow at the National Aeronautics and Space Administration from 2008 to 2009. He received his Ph.D. degree in geography from the University of Georgia in 1999. Prof. Weng is the Lead of GEO Global Urban Observation and Information Initiative, 2012-2022, and an Editor-in-Chief of ISPRS Journal of Photogrammetry and Remote Sensing. Additionally, he serves as the Series Editor of Taylor & Francis Series in Remote Sensing Applications, and Taylor & Francis Series in Imaging Science. Prof. Weng has been the Organizer and Program Committee Chair of the biennial IEEE/ISPRS/GEO sponsored International Workshop on Earth Observation and Remote Sensing Applications conference series since 2008, a National Director of American Society for Photogrammetry and Remote Sensing from 2007 to 2010, and a panelist of U.S. DOE's Cool Roofs Roadmap and Strategy in 2010. He has been honored with distinguished career awards that include NASA senior fellowship, AAG Distinguished Scholarship Honors Award, Taylor & Francis Lifetime Achievements Award, and Japan Society for the Promotion of Science (Short-term S[E]) Fellowship. He is the author of over 272 articles, 14 books, and 5 conference proceedings, with over 28,000 citations and H-index of 74.

Department of Land Surveying and Geo-Informatics

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Research Interests
Geodesy, Engineering Surveys, Hydrographic Surveys, Deformation Monitoring, GNSS Surveys, Data Processing and Analysis, and Development of Fibre Optic Sensors for Monitoring of Structure Health and Environment

Biography
CHEN Yong Qi obtained his PhD in Surveying Engineering from University of New Brunswick, Canada in 1983. He was Professor and Department Chairman at Wuhan Technical University before joining PolyU. Since 1994 he served LSGI as Chair Professor and Department Head for 16 years. He is now Emeritus Professor and Visiting Chair Professor in the Department. He has published 7 books and over 400 technical papers. Dr Chen also actively served the professional/academic communities in various capacities: Honorary Research Fellow at UNB, Canada; Honorary/Advisory Professor in 16 universities and research institutes, China; member of the scientific application committee of China's ChangE-1 lunar exploration; Vice Chaiman/Chairman of Commission 6 of International Federation of Surveyors; editorial board member for various journals, like the Journal of Geodesy, the GPS Solution; RGC Engineering Panel member, etc. He has received various awards/honours, including an international scientist exchange award from the National Science and Engineering Research Council, Canada, and a special award from the State Council of Chinese government in recognition of his significant contribution to Chinese higher education. He was named as the Father of Modern Deformation Analysis by the Canadian Centre for Geodetic Engineering.

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Teaching Areas
Remote Sensing, Geographical Information System

Research Interests
Use of Remote Sensing to Study Urban Heat Island Effect, Urban Environmental Quality, Landslides, Vegetation and Ecosystems, Spectral Mixture Analysis, Aerosol Retrieval, Water Vapour Retrieval and Solar Energy Potential, Application of Geographical Information Systems to Analyse Wind Ventilation Corridors, Wall-Effect Buildings, Spatial Inequity and Public Health, Sensor Development and Analysis for Smart City Tree Management and Micro-Environmental Monitoring, Use of iBeacon Technology in Teaching and Learning

Biography
Prof. Wong received his PhD in Remote Sensing and GIS in 2009, MPhil in Remote Sensing and GIS in 2005 and BSc in Land Surveying and Geo-Informatics in 2003 from The Hong Kong Polytechnic University. In 2005, he joined LSGI as a part-time Research Fellow, then became a Senior Research Fellow in 2011, Assistant Professor in 2012 and Associate Professor in 2018. He was a Fulbright scholar at the Earth System Science Interdisciplinary Center of the University of Maryland, College Park from 2006 to 2007. Prof. Wong has established a strong connection in his research areas and is leading a number of projects on the use of remote sensing in urban heat island effect, vegetation and ecosystems, aerosol retrieval, water quality monitoring; GIS in smart city tree management; and iBeacon technology for engaging Learning experiences.

Prof. LIU Zhizhao George
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Teaching Areas
Advanced Surveying Data Adjustment and Analysis, Satellite Positioning and Navigation, Hydrographic Surveying, Mapping

Research Interests
Global Navigation Satellite System (GNSS) Theory and Applications, Space Geodesy, Engineering Surveying, Atmospheric Remote Sensing Using GNSS Technique, the Ionospheric Study and Modelling Based on GNSS Data

Biography
Prof. Liu is an internationally recognised specialist in the Global Positioning System (GPS)/ Global Navigation Satellite System (GNSS) community. His research group discovered a GPS ionospheric data anomaly that has existed in the GPS community for more than two decades. For the first time in Hong Kong, ionospheric scintillations due to tropical cyclones were observed by his team, who established Hong Kong's first GPS/GNSS-based ionosphere scintillation monitoring system (two stations), GPS/GNSS and Radiosonde Water Vapor Observation Co-location System, as well as a GPS-PPP-based (Precise Point Positioning) Atmospheric Precipitable Water Vapor Real-Time Monitoring System (PWVRMS) for the Pearl-River-Delta (PRD) Region. He is the founder of the New GNSS Algorithms and Techniques for Earth Observations (nGATEo) biennial Summer Course Series. He earned his PhD degree from the University of Calgary in 2004, and worked in the Canadian GPS/GNSS industries prior to joining the Department of Land Surveying and Geo-Informatics as an assistant professor in June 2009. Currently, he is the managing editor of the Journal of Global Positioning Systems and the Secretary of a Sub-Commission on the Multi-Constellation GNSS of the International Association of Geodesy. He is Director of the International Association of Chinese Professionals in Global Positioning Systems. He is a recipient of many awards, including the inaugural Hong Kong Research Grants Council's Early Career Award (2012).

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Teaching Areas
Photogrammetry, GIS, Spatial Analysis

Research Interests
Photogrammetry and Robotic Vision, Planetary Remote Sensing and Mapping, 3D GIS and Applications

Biography
Prof. Wu joined PolyU in 2009, becoming an Associate Professor in 2015 and then Professor in 2020. His main research areas are photogrammetry and remote sensing, with a focus on planetary remote sensing and science. He worked on NASA-funded projects for Mars and Moon exploration missions at the Ohio State University. Since joining PolyU, he worked on landing site mapping and analysis for China's Chang'E-3 and Chang'E-4 lunar missions, contributed to their successful landing on the Moon in 2013 and 2019, respectively. He has published over 120 peer-reviewed articles in internationally renowned journals and conferences. He has secured total funding of over HK$18 million from the Research Grants Council (RGC), the National Science Foundation of China (NSFC), and the China Academy of Space Technology (CAST), including a RGC Research Impact Fund of HK$6.38 million. His research has been recognized by a number of awards, including the Leader of the Year Award 2019, Dean's Award for Outstanding Achievement in Research Funding, R. Alekseev Award and Gold Medal from the 44th International Exhibition of Inventions of Geneva, Talbert Abrams Award from ASPRS, Duane C. Brown Senior Award for Photogrammetry, etc. He co-chairs working groups of the International Society for Photogrammetry and Remote Sensing. He serves as associate editor or editorial board member of three SCI journals.

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Teaching Areas
Space Geodesy, Climate Change, Geophysics, Geophysical Data Processing

Research Interests
Space Geodesy and Applications, Climate Change, Hydrology, Oceanography, Geodynamics, Earth Rotation, Gravity Field, Core-Mantle Interactions Seismic Deformation (from Gravity and GPS Observations), GNSS Applications (Loading Deformation, Mass Load Inversion)

Biography
Dr. Jianli Chen is a Strategic Hiring Scheme (SHS) Professor in the Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University. Before moving to Hong Kong, he had spent 28 years of his productive and rewarding academic career at the Center for Space Research, University of Texas at Austin. Dr Jianli Chen is a world renowned expert in space geodesy and its applications in Earth sciences. He has been working on topics related to global climate change and geophysical applications of space geodetic techniques, including satellite gravimetry, satellite altimetry, and other geodetic measurements for nearly 30 years. He has been extensively involved in data processing, results validation, and geophysical interpretation of the Gravity Recovery and Climate Experiment (GRACE) satellite gravimetry mission, and is a leading science team member of both the GRACE and GRACE Follow-On missions. He is a fellow of the International Association of Geodesy, and has severed as the chair of the IERS Special Bureau for Hydrology since 2004, and co-chair/chair of the IAG Commission 3.3 (Earth Rotation and Geophysical Fluids) since 2012. A crowning distinction of his decorative career was the prestigious 2005 Presidential Early Career Awards for Scientists and Engineers (PECASE), the highest honor bestowed by the United States government on early career scientists and engineers (he was the first PECASE awardee in the related science field).

Dr LAI Wai-lok Wallace
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Teaching Areas
Near-surface Geophysics, Nondestructive Testing of Materials, Utility System, Design, Construction, Survey and Management

Research Interests
Near-surface Geophysics, Nondestructive Testing of Materials

Biography
Wallace has been working on nondestructive and near-surface geophysical DIAGNOSIS and IMAGING of unseen members and hazards in underground utility networks and concrete infrastructures, or simply 'SEEING THE UNSEEN.' His main teaching and research interests include survey & mapping, 3D imaging, and diagnosis of engineering structures, underground utilities, construction materials, hydro-geophysics, and sites of archaeology value. These techniques include ground penetrating radar, infrared thermography, acoustic, ultrasound, electrical resistivity, acoustic leak noise correlation, etc.

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Teaching Areas
Geographic Information Systems, Geomatics Algorithms and Geodatabase, Infrastructure and Utility Management

Research Interests
GISci, Complex Network, GIS in Transportation, Transportation Geography, Urban Computing, Urban Mobility and Sustainability, State-of-the-art Technologies for Smart Cities

Biography
Dr Xintao Liu received a Bachelor of Engineering in Survey from Hohai University, China in 1998, a Master of Science in Cartography & GIS from Nanjing Normal University, China in 2003, and a PhD in Geo-Informatics from the Royal Institute of Technology, Sweden in 2012. In the same year, he joined the Department of Civil Engineering at Ryerson University in Canada and worked as a Postdoctoral Fellow in GIS and Transportation until 2016. He was also a sessional lecturer and the manager of the Urban Transportation Lab at Ryerson University since 2015. He is a recipient of many awards, including the Lundbergs Scholarship from Lars Erik Lundbergs, and a Mobility scholarship from Nordic Network in GIS. He spearheaded and co-organized the 4th International Conference on Earth Observation for Global Changes (EOGC) and the 2013 Canadian Institute of Geomatics (CIG) Annual Conference in Canada, and the ISPRS and International Geographical Union (IGU) Joint International Conference in 2014 in Canada. He participated in several national projects funded by Sweden and Canada. He is a reviewer of a series of major international journals such as IJGIS and AAG.

Dr Robert TENZER

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Teaching Areas
Geodesy, Survey Adjustment, Geodetic Control

Research Interests
Geodesy, Geophysics, Remote Sensing, Geodynamics

Biography
Dr Tenzer is an Associate Professor in the Department of Land Surveying and Geo-Informatics. He received MSc in Geodesy and Cartography and PhD in Physical Geodesy at the Slovak Technical University and PhD in Satellite Geodesy at the Czech Technical University. Between 2001 and 2008, he held research positions at the University of New Brunswick, the University of Newcastle upon Tyne and the Delft University of Technology. Between 2009 and 2012, he taught at the University of Otago. Between 2012 and 2016, he was Visiting Professor in the School of Geodesy and Geomatics at the Wuhan University. His research interests cover broad areas of Geodesy, Geophysics, Geodynamic and Planetary Science, with major focus on geospatial modeling techniques and interpretations, theoretical geodesy and geophysics, geo-referencing, planetary inner structure and processes. He is author of 4 books and more than 200 research journal articles (155 records on Scupus, 124 records on WoS). He presented his research in 195 conferences and 60 invited lectures. He is a member of editorial board and scientific adviser to several journals, while also contributing as the reviewer to more than 40 journals. Currently, he is the chair of the International Association of Geodesy study group IC-SG7: Earth's inner structure from combined geophysical sources.

Department of Land Surveying and Geo-Informatics

Dr ZHU Xiaolin
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Teaching Areas
Remote Sensing, Geostatistics, Spatial Analysis

Research Interests
Remote Sensing and Geospatial Analysis, with focusing on Missing Data Reconstruction, Spatiotemporal Data Fusion, Classification, Change Detection, Land Surface Information Retrieval, and Applications of Geoscience in Urban and Ecological Studies

Biography
Dr Zhu received his BSc in 2007 and MSc in 2010, both from Beijing Normal University. He received his PhD in geography at Ohio State University in 2014. Before coming to PolyU, he was a postdoctoral scholar in the Center of Spatial Technologies and Remote Sensing at the University of California, Davis. His research interests include remote sensing methods and applications. In particular, his research covers three areas: 1) developing new techniques to improve the quality of remote sensing data, 2) monitoring ecosystems and urban environment in spatial and temporal domains, 3) analyzing the spatial patterns and causes of land surface disturbances. He was a recipient of prestigious awards, including the Presidential Fellowship from Ohio State University, the Robert N. Colwell Memorial Fellowship Award from the American Society of Photogrammetry and Remote Sensing, and the Li Xiaowen Remote Sensing Young Scholar Award. He was awarded China's Excellent Young Scientists Fund in 2020. He is currently an editorial board member for Science of Remote Sensing, Remote Sensing, and Big Earth Data.

Dr WANG Shuo
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Teaching Areas
Climate Change and Society, Spatial Data Analysis, Geostatistics, Mapping Science

Research Interests
Climate and Hydrology, Weather and Climate Extremes, Remote Sensing Applications, Global Change, Environmental Sustainability, Environmental Informatics

Biography
Dr Shuo Wang is an Assistant Professor in the Department of Land Surveying and Geo-Informatics at the Hong Kong Polytechnic University. His research interests include exploring the dynamics of weather and climate extremes and their impacts on the environment and society. Dr Wang received his Bachelor's degree (Hons) from Monash University, Australia in 2008, and then he received his Master's degree (2011) and Ph.D. (2015) in Environmental Systems Engineering from the University of Regina, Canada. Prior to joining the Hong Kong Polytechnic University, Dr Wang was a Research Assistant Professor in the Department of Geosciences and an affiliate faculty member of the Climate Science Center at Texas Tech University, USA. His research has been funded from a variety of sources, including the National Natural Science Foundation of China (NSFC), the Research Grants Council (RGC) of Hong Kong, Hong Kong Environment and Conservation Fund (ECF), the Natural Sciences and Engineering Research Council of Canada (NSERC), and the Government of Saskatchewan. Dr Wang has published more than 70 peer-reviewed articles with h-index of 21 (Web of Science) in prestigious international journals, including Nature Communications, Geophysical Research Letters, Water Resources Research, and Journal of Geophysical Research: Atmospheres. In addition, Dr Wang has been invited as a reviewer for more than 50 scientific journals, and he has received Outstanding Reviewer Award (Elsevier) and Global Peer Review Award (Publons). Dr Wang currently serves as an Associate Editor for Journal of Hydrology and an Editorial Board Member for Environmental Research Communications.

Dr XU Yang
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Teaching Areas
Urban Big Data, Geographic Information System, Spatial Analysis, Geospatial Database

Research Interests
GIScience, Human Mobility, Urban Informatics, GeoAI

Biography
Dr Xu received his BSc in Remote Sensing and Photogrammetry (2009) and MSc in GIS (2011) at Wuhan University. He obtained his PhD in geography (2015) at the University of Tennessee, Knoxville. Before joining the Hong Kong Polytechnic University, Dr Xu worked as a joint postdoctoral associate at the MIT SENSEable City Lab and the Singapore-MIT Alliance for Research and Technology (SMART). Dr Xu's research focuses on developing geospatial and big data analytics to advance understanding and modeling of human mobility in urban contexts. He is the recipient of the Young Scholar Award (2022) from the International Association of the Chinese Professionals in Geographic Information Sciences (CPGIS). His research on quantifying urban social segregation was featured by the FastCompany 2020 Innovation by Design Awards. More recently, his works on tourism big data analytics received the Journal Paper of the Year Award in both 2021 (2nd place) and 2022 (1st place) granted by the International Federation for IT and Travel & Tourism (IFITT). Dr. Xu's research is funded by the Hong Kong Research Grants Council (RGC), National Natural Science Foundation of China (NSFC), Local and National Tourism Organizations, and private companies.

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Teaching Areas
Land Boundary Survey, Digital Terrain Modelling, Remote Sensing

Research Interests
Laser Scanning, Point Cloud Processing, Remote Sensing

Biography
Dr Wai Yeung Yan received his PhD degree in civil engineering from Ryerson University, Toronto, Ontario, Canada, in 2012. Currently, he is an Assistant Professor with the Department of Land Surveying and Geo-informatics and an Adjunct Professor with the Department of Civil Engineering, Ryerson University. His research interests include point cloud processing, laser scanning, and remote sensing.

Dr YAO Wei
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Teaching Areas
Photogrammetry and Remote Sensing, Surveying, Geospatial Computer Vision and Machine Learning, Geographical Information System

Research Interests
Multi-modality 3D Remote Sensing Towards Reconstruction and Perception of Spatial-temporal Behaviors of Geospatial Objects, Image Processing and Analysis, Pattern Recognition, and Related Environmental and Industrial Applications, such as Landslide/Glacier and Ecosystem Mapping, Mobile Mapping for Indoor Navigation and Smart City Management, Water Depth and Quality Retrieval, Sensor Fusion for Environmental Informatic

Biography
Dr-Ing. Wei Yao received both Dipl.-Ing. (Univ.) degree in Geodesy and Geoinformation and PhD from the Technische Universität München (TUM), Germany. From 2007 to 2017, he has been a scientific collaborator and lecturer within the Institute of Photogrammetry and Cartography of TUM and worked as a senior scientist in the applied research cluster of computer vision, remote sensing and navigation at Munich University of Applied Sciences. His main research interests include LiDAR/radar remote-sensing towards reconstruction and leaning of spatial-temporal behaviors of geospatial objects, image processing, pattern recognition, and related environmental & industrial applications. His works were funded by research programs of German government, Bavarian Ministry of Science and Research, the Hong Kong government and NSFC, and he has already published more than 110 academic articles in renowned international journals and conferences. He was named a winner of the Chinese Government Award for Outstanding Self-Financed Students Abroad, which is granted around the world across all disciplines. He was the recipient of a Best Presentation Award of international symposium on Mobile Mapping. He also received four Best Paper Awards from ISPRS, IEEE geoscience and remote sensing society and ITC of the nertherlands. Since 2016 he became the working group co-chair of ISPRS commission III responsible for ISPRS laser scanning and data fusion events. His developed system and technology have been put into business operations at various government and commercial departments.

Dr YIN Tiangang
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Research Interests
Quantitative Remote Sensing, 3-D Radiative Transfer Modeling (forward and inverse), 3-D Urban/Forest Reconstruction using LiDAR and Stereo Photogrammetry, Urban Tree Monitoring and Management, Urban Climate and Ecosystem Services, Physical Modeling of Passive/Active Sensor Mounted on Satellite/Aircraft/Mobile Platform, Solar-induced Chlorophyll Fluorescence, Science-driven Pre-launch Study for Earth-Observation Satellites, Physically-based Ray Tracing, Energy Balance, Data/Sensor Fusion, Big-data Driven Global Photosynthesis Modeling

Biography
Prior to joining LSGI, Dr Yin was a research scientist jointly at NASA Goddard Space Flight Center (GSFC) and the Earth System Science Interdisciplinary Center of the University of Maryland. Before that, he was a SMART Scholar Postdoctoral Fellow at the Singapore-MIT Alliance for Research and Technology (SMART). He obtained his B.Sc. in Physics and M.Eng. in Computer Engineering from National University of Singapore (NUS), and his Ph.D. in Remote Sensing and Geoscience from the Centre d'Etudes Spatiales de la BIOsphère (CESBIO), CNES-CNRS-IRD-UPS, Toulouse, France. Dr Yin has been leading the developments of the 1) LiDAR, 2) photogrammetry, and 3) atmosphere modules in the 3-D discrete anisotropic radiative transfer (DART) model since 2011. At GSFC, he was a task leader for the "Solar-Induced Fluorescence Airborne Research Experiment". He developed the PVlad model for 3-D realistic reconstruction of forests using airborne LiDAR data. He participated in the pre-launch modeling study of NASA's future LiDAR-Stereo satellite based on the Surface Topography and Vegetation (STV) scheme under the Decadal Survey Incubation program by integrating PVlad with DART. He also led the "Computerized Management of Urban Trees" project (2017-2021) supported by the Singapore Ministry of National Development: a UAV-based hyperspectral remote sensing platform was built to monitor the health status of urban individual trees.

Dr ZHUGE Cheng-xiang Tony
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Teaching Areas
Geographic Information System, Spatial Planning, Urban Analytics

Research Interests
Spatial Analysis and Modelling, Activity-based Travel Demand Modelling, Smart Cities, Land Use and Transport Interaction, Agent-based Modelling, Complex Urban System

Biography
Dr Zhuge is an Assistant Professor in the Department of Land Surveying and Geo-Informatics (LSGI), The Hong Kong Polytechnic University (PolyU). Prior to joining PolyU, he was a Senior Research Associate at the University of East Anglia (United Kingdom). He obtained his Bachelor's and first doctoral degrees in Transportation from the Beijing Jiaotong University (China) and second doctoral degree in Geography from the University of Cambridge (United Kingdom). His research investigates complex dynamic urban systems, using agent-based modelling and big data. This involves several urban sub-systems, including transportation, land use, environment, energy, economy and population systems. Specific research topics include activity-based travel demand modelling, land use and transport interaction model and smart mobility.

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Teaching Areas
Advanced Geographic Information Systems, Geospatial Database Management and Design

Research Interests
GIScience, Remote Sensing, Spatial Data Science, GeoAI, Urban Informatics

Biography
Dr Cao is currently a Research Assistant Professor at the Department of Land Surveying and Geo-Informatics (LSGI), The Hong Kong Polytechnic University. His research interests lie in Geospatial Artificial Intelligence (GeoAI) and Urban Informatics. He has published over 20 peer-reviewed papers in venues related to Geographic Information Science. His works have been cited over 600 times according to Google Scholar. He has led and participated in several research grants as roles of PI and Co-I funded by NSFC, UGC, Microsoft, Tencent, etc. He also undertakes teaching and postgraduate training related to Geographic Information Science. He is a member of ACM SIGSPATIAL, CCF, CPGIS, IEEE, ISPRS, and ISUI, and he has served as a reviewer for NSFC and more than 15 international journals.

Department of Land Surveying and Geo-Informatics

Dr DUAN Ran
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PhD

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Teaching Areas
Computer Vision, Deep Learning, Robotics

Research Interests
Visual SLAM, Smart-vision, UAVs

Biography
Dr Ran DUAN received the BSc in communication engineering from Southwest University of Science and Technology, China, and MSc in computer vision in 2015, from University of Bourgogne, France (European VIBOT program). From 2015 to 2017, he worked at Nanyang Technological University (NTU) as a Research Associate. In 2022, he received his Ph.D degree from Department of Aeronautical and Aviation Engineering (AAE), the Hong Kong Polytechnic University and joined the PRSLab at LSGI. His research areas include Visual SLAM, smart-vision, UAVs.

Dr Ameer Hamza KHAN

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PhD

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Teaching Areas
Smart Cities, Urban Sciences

Research Interests
Robotics, Control Systems, SLAM, Autonomous Navigation

Biography
Dr Ameer Hamza received the B.S. degree in electrical engineering from the Pakistan Institute of Engineering and Applied Sciences, Islamabad, Pakistan, in 2015 and a Ph.D. degree in Computing from The Hong Kong Polytechnic University in 2021. He is now a Research Assistant Professor in the Department of Land Surveying and Geo-Informatics (LSGI), The Hong Kong Polytechnic University. He is currently working on autonomous navigation of mobile robots with simultaneous localization and mapping (SLAM). His research interests include nonlinear optimization, robotics, control theory, and machine learning.

Dr Lawrence LAU
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MPhil, PhD, FRICS, FICES, FRIN

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Teaching Areas
Advanced Topics in Geomatics, Engineering Surveying

Research Interests
GNSS/GPS Error Modelling and Mitigation, High-precision Positioning Algorithm, Indoor Positioning, GNSS for Engineering, Environmental and Smart-city Applications

Biography
Dr Lawrence Lau obtained his PhD degree in Positioning, Navigation and Space Geodesy from University College London (UCL) UK in 2005. In 1995 – 1997, he worked as a junior land surveyor in the Hong Kong Mass Transit Railway Corporation (MTRC). In 1999 – 2002, he worked in the Hong Kong Polytechnic University as a Research Associate on land vehicle navigation research, and a part-time Lecturer in Engineering Surveying at the Hong Kong Institute of Vocational Education. He was a Technical Analyst in Nottingham Scientific Limited in the UK from 2002 to 2004; he worked on two Galileo development projects funded by EU/ESA. In 2004 – 2010, Lawrence was a Postdoctoral Research Fellow at UCL. He worked as an Associate Professor in the Institute of Geomatics in Barcelona in 2010 - 2011. Dr Lau was an Assistant Professor (2011-2017) and an Associate Professor (2017-2020) at the University of Nottingham, Ningbo China campus. In 2020, Lawrence returned to PolyU to work as a Research Assistant Professor. Lawrence has practical and industrial experience in engineering surveying and space geodesy. Moreover, he has significant research and lecturing experience in the same areas.

Dr LI Zhiwei
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BEng, PhD

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Teaching Areas
Remote Sensing, Digital Image Processing, Machine Learning

Research Interests
Urban Remote Sensing, Cloud Detection and Removal, Multi-source Data Fusion, Land Use & Land Cover, Flood Monitoring, Geospatial Artificial Intelligence

Biography
Dr Zhiwei Li is currently a Research Assistant Professor at the Department of Land Surveying and Geo-Informatics at The Hong Kong Polytechnic University. He obtained his Ph.D. degree in Cartography and Geoinformation Engineering from Wuhan University in 2020. Before his current affiliation, he worked as a Postdoctoral Fellow and Assistant Research Fellow at Wuhan University from 2020 to 2022. His research interests mainly focus on urban remote sensing, cloud detection and removal, multi-source data fusion, land cover and land use, flood monitoring, etc. He was the PI of three projects funded by the National Natural Science Foundation of China (NSFC) and the China Postdoctoral Science Foundation. The methods and tools he developed have been widely applied to pre-processing of multiple types of satellite images to support national land resources monitoring by the China Land Survey and Planning Institute and other related departments.

Dr NAZEER Majid

Research Assistant Professor
PhD

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Teaching Areas
Remote Sensing, Geographic Information Science, Geo-statistical Analysis

Research Interests
Inland/Coastal Waters Remote Sensing, Atmospheric Correction of Satellite Imagery, Atmospheric Aerosols

Biography
Dr Nazeer has earned his PhD from the Department of Land Surveying and Geo-Informatics (LSGI), The Hong Kong Polytechnic University (PolyU), Hong Kong in 2016. Currently, he is serving his alma mater (PolyU) as Research Assistant Professor. Previously, he has served in universities in Mainland China, Pakistan and Saudi Arabia. His research interests include remote sensing of inland/coastal waters, atmospheric aerosols and atmospheric correction of satellite imagery. His current research is on the health assessment of inland water bodies under changing climate scenarios using earth observation data sets. He is actively looking for collaborators for his current research. During the last eight years, he has authored/co-authored 33 peer-reviewed journal articles, one book chapter and 9 articles in different international conferences. During 2018, he has completed two funded projects as Co-PI with an accumulative amount of USD 19,000. He is an active reviewer of more than 30 international journals including Remote Sensing of Environment, Remote Sensing, Journal of Applied Remote Sensing and Science of the Total Environment.

Dr SHI Guoqiang
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Teaching Areas
Remote Sensing; Geodesy

Research Interests
Urban Geo-hazards; InSAR; Remote Sensing; Infrastructure Monitoring

Biography
Dr Shi is currently a Research Assistant Professor with the Department of Land Surveying and Geo-Informatics (LSGI), The Hong Kong Polytechnic University (PolyU). Before joining PolyU, Dr Shi was a Postdoctoral Fellow with the Institute of Space and Earth Information Science (ISEIS), The Chinese University of Hong Kong (CUHK). His research interests include interferometric synthetic aperture radar (InSAR) remote sensing for urban geohazards monitoring and modelling, urban geophysics (groundwater, coastal reclamation, landslides, built environment), and infrastructure health diagnosis. He is currently working on slope instability assessment in the forested and mountainous regions of Hong Kong, and the Greater Bay Area of China.

Dr SUN Yangjie
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PhD

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Teaching Areas
Geographical Information System, Remote Sensing

Research Interests
3D GIS, 3D Scene Reconstruction and Segmentation, 3D Visualization, Photogrammetry and Computer Vision, Deep Learning

Biography
Dr Sun received the M.S. degree in cartography and geography information system from Central South University, China, in 2016, and the Ph.D. degree in photogrammetry and remote sensing from Wuhan University, China, in 2021. His research interests include remote sensing image segmentation, deep learning, 3-D scene reconstruction and segmentation, and 3D GIS.

Dr WENG Doujie
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Teaching Areas
Positioning Technology, GNSS, Location-based Service

Research Interests
GNSS, Personal Navigation System, Indoor Positioning, GNSS Interference Monitoring

Biography
Dr Duojie Weng received his BSc in 2007 and MSc in 2010, both from Hohai University. He received his PhD in positioning at The Hong Kong Polytechnic University in 2016. Dr Duojie Weng has worked as Research Assistant, Research Associate and Postdoctoral Fellow in LSGI since 2010. His research interests include GNSS, high-precision positioning system, sensor fusion, and indoor positioning system.

Department of
Land Surveying and Geo-Informatics

Dr YOO Cheolhee
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Teaching Areas
Remote Sensing, Geostatistics, Spatial Analysis, GEO-AI

Research Interests
Urban Remote Sensing /GIS/Artificial Intelligence / Urban Climate / Urban Carbon Emission

Biography
Dr YOO obtained his Ph.D. in the Department of Urban and Environmental Engineering from Ulsan National Institute of Science and Technology (UNIST), South Korea, in 2022, and his B.E. in the Department of Urban and Environmental Engineering from UNIST in 2017. Dr. YOO worked as a Postdoctoral Fellow in LSGI from April to September 2022. He was an intern at the Geoinformatics Unit at RIKEN Center for Advanced Intelligence Project (AIP), Japan, from January to March 2019. He has published more than 17 SCI papers in the past 5 years. He is currently an Editorial Board Member of the ISPRS Journal of Photogrammetry and Remote Sensing. His research interests include urban remote sensing, geographic information system, and the use of artificial intelligence to interpret remote sensing images for disaster management and environmental monitoring.

Dr ZHANG An-shu
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Teaching Areas
Geographic Information Systems, Spatial Data Analyses and Mining, Spatial Databases

Research Interests
Space Time Pattern Mining, Urban Computing, Urban Big Data Analytics, Human Mobility Modeling and Forecast

Biography
Dr Zhang received her BSc degree in Geo-Information Technology in 2011 and her PhD in Geographic Information Systems in 2017 from The Hong Kong Polytechnic University. Her research interests include spatial data mining, human mobility modeling and prediction, with the emphasis on improving the robustness and reliability of data analytics by approaches such as statistical tests, evolutionary computing, and explainable artificial intelligence. She was the secretary of Working Group II/1, The International Society for Photogrammetry and Remote Sensing (2012–2016). She has participated in multiple government-funded projects and is the principle investigator of a sub-project (CNY 1,772,500) under the State Key R&D Scheme funded by the Ministry of Science and Technology of China. She received the China Science and Technology Progress Award in Surveying and Mapping (Grand Award) in 2017.

Dr ZHANG Min
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Teaching Areas
Principle of GIS

Research Interests
Deep Learning, Explainable Artificial Intelligence, Remote Sensing Image Processing, Change Detection, 2D & 3D Spatial Data Quality, Web/Mobile GIS

Biography
Dr Zhang's research interests include deep learning, artificial intelligence, remote sensing, change detection, object recognition, and spatial data quality. He has developed a series of deep learning algorithms for remote sensing object extraction (e.g., building, landslide, boulder etc.) and change detection, and such algorithms are integrated into a software that has been applied to multiple departments, including Civil Engineering and Development Department in Hong Kong, Zhejiang Geographic Information Center, Jiangsu Academy of Surveying and Mapping Engineering, and Beijing Institute of Surveying and Mapping in China.

Distinguished Chair Professors

Department of Civil and Environmental Engineering

Prof. Roderick Arthur SMITH

- Fellow, Royal Academy of Engineering, UK
- Past President, Institution of Mechanical Engineers
- Emeritus Professor, Imperial College London, UK
- Infrastructure Commissioner for Wales
- Distinguished Chair Professor of CNERC-Rail, The Hong Kong Polytechnic University, Hong Kong

Department of Land Surveying and Geo-Informatics

Prof. Michael BATTY

Michael Batty is Bartlett Professor of Planning at University College London where he is Chair of the Centre for Advanced Spatial Analysis (CASA). He has worked on computer models of cities and their visualisation since the 1970s and has published several books, such as Cities and Complexity (MIT Press, 2005) which won the Alonso Prize of the Regional Science Association in 2011, and most recently The New Science of Cities (MIT Press, 2013). His blogs www.complexcity.info cover the science underpinning the technology of cities and his posts and lectures on big data and smart cities are at www.spatialcomplexity.info . His research group is working on simulating long term structural change and dynamics in cities as well as their visualisation. Prior to his current position, he was Professor of City Planning and Dean at the University of Wales at Cardiff and then Director of the National Center for Geographic Information and Analysis at the State University of New York at Buffalo. He is a Fellow of the British Academy (FBA), the Academy of Social Sciences (FAcSS) and the Royal Society (FRS), was awarded the CBE in the Queen's Birthday Honours in 2004 and the 2013 recipient of the Lauréat Prix International de Géographie Vautrin Lud (generally known as the 'Nobel de Géographie'). This year 2015 he received the Founders Medal of the Royal Geographical Society for his work on the science of cities. In 2016 he received the Gold Medal of the Royal Town Planning Institute, and the Senior Scholars Award of the Complex Systems Society. He has Honorary Doctorates form the State University of New York and from the University of Leicester.

Prof. Michael GOODCHILD

Michael F. Goodchild is Emeritus Professor of Geography at the University of California, Santa Barbara, where he also holds the title of Research Professor. He is also Distinguished Chair Professor at the Hong Kong Polytechnic University and Research Professor at Arizona State University, and holds many other affiliate, adjunct, and honorary positions at universities around the world. Until his retirement in June 2012 he was Jack and Laura Dangermond Professor of Geography, and Director of UCSB's Center for Spatial Studies. He received his BA degree from Cambridge University in Physics in 1965 and his PhD in geography from McMaster University in 1969, and has received five honorary doctorates. He was elected member of the National Academy of Sciences and Foreign Member of the Royal Society of Canada in 2002, member of the American Academy of Arts and Sciences in 2006, and Foreign Member of the Royal Society and Corresponding Fellow of the British Academy in 2010; and in 2007 he received the Prix Vautrin Lud. He was editor of Geographical Analysis between 1987 and 1990 and editor of the Methods, Models, and Geographic Information Sciences section of the Annals of the Association of American Geographers from 2000 to 2006. He serves on the editorial boards of ten other journals and book series, and has published over 15 books and 500 articles. He was Chair of the National Research Council's Mapping Science Committee from 1997 to 1999, and of the Advisory Committee on Social, Behavioral, and Economic Sciences of the National Science Foundation from 2008 to 2010. His research interests center on geographic information science, spatial analysis, and uncertainty in geographic data.

Prof. Dr.-Ing. Liqiu MENG

Prof. Meng conducts research in the field of cartography and visual analytics. Her recent research focus includes geodata integration, spatial cognition, Mixed Reality, visual data mining, map-based multimodal navigation services, and open portal for geospatial events. Prof. Meng earned her M.Sc. in cartography and geodetic engineering in 1985 in China and her PhD in geodetic engineering at the University of Hannover in 1993. She earned her university teaching qualification in 1998 at the Royal Institute of Technology, Sweden, and was appointed to the Chair of Cartography at TUM the same year. From 2009 to 2012, Prof. Meng was Senator of the Helmholtz Association for the research field Earth and Environment. From 2008 to 2014, she served as Senior Vice President of TUM for international alliances and alumni. She has been a member of the German National Academy of Sciences since 2011 and of the Bavarian Academy of Sciences since 2013. She is Vice President for the International Cartographic Association.

Professors of Practice

Department of Building and Real Estate

Dr CHAN Man Wai
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Dr CHEE Simon
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Ir TSANG Sau Kit Wilson
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Ir HO Ken
何建生先生
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Department of Land Surveying and Geo-Informatics

Mr LING Kar-kan
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Research Postgraduate Programmes Overview

https://www.polyu.edu.hk/fce/study/programme-prospectus

FCE provides numerous programmes for studies leading to the Doctor of Philosophy (PhD) or Master of Philosophy (MPhil) degrees. Research students are nurtured to become scholars, researchers, and entrepreneurs who can demonstrate research and scholarship excellence, conduct independent and original research, and engage in lifelong learning.

Our Research Postgraduate (RPg) Programmes are designed to facilitate the competence development in research methods and scholarship. Students are encouraged to display sustained effort and independent original thought for high-impact interdisciplinary research. The Faculty also strives to develop entrepreneurial competencies in students by promoting the exchange of inventive ideas and entrepreneurial experiences.

MPhil and PhD students are required to satisfactorily investigate or evaluate a chosen area, to show understanding of the context and significance of the work, and to present a compelling thesis worthy of publication. Furthermore, PhD students are expected to produce evidence and arguments to support an original proposition that represents a significant contribution to knowledge.

The degree of PhD or MPhil shall be awarded to a student who, on completion of an approved programme and fulfilling the coursework requirements for graduation, presents a thesis embodying the results of his/her research and satisfies the examiners in an oral examination (and other examinations if required) in matters relevant to the subject of the thesis.

Modes of Study, Duration and Coursework Requirements

Degree	Study Mode	Normal Study period#	Maximum Study Period	Coursework Requirement
PhD	Full-time	3 years*	5 years	15 credits
	Part-time	4 years#	6 years	
	Full-time	6 years*	7 years	22 credits
	Part-time	8 years#	9 years	
MPhil	Full-time	2 years	3 years	9 credits
	Part-time	4 years	5 years	

** for PhD students admitted on the basis of an MPhil or equivalent*

 # for PhD students admitted on the basis of a Bachelor's degree with First Class Honours (or equivalent qualification), OR a Master's degree

PhD/MPhil Programmes

Departments	PhD/MPhil Programmes
BEEE	• Building and Environment • Building Energy • Building Safety and Resilience • Electrical Services • Facility Management
BRE	• Construction and Real Estate Economics • Construction and Real Estate Management • Information and Construction Technology • Urban Sustainability Policy
CEE	• Coastal and Hydraulic Engineering • Construction and Transportation • Environmental Engineering and Science • Geotechnical Engineering • Structural Engineering
LSGI	• Geomatics • Urban Informatics and Smart City

Research Subjects

FCE has strengthened its research postgraduate programmes by offering a range of faculty-based and departmental-based subjects to our research students.

Subject Offering Departments	Subject Code	Subject Title
University subjects		
English Language Centre (ELC)	ELC6001[1]	Presentation Skills for Research Students
	ELC6002[1]	Thesis Writing for Research Students
Department of English (ENGL)	ENGL6016[1]	Advanced Academic English for Research Students: Publishing and Presenting
Department of Health Technology and Informatics (HTI)	HTI6081[2]	Ethics: Research, Professional & Personal Perspectives
Faculty subjects		
Faculty of Construction and Environment (FCE)	CE603[3]	Research Frontiers in Construction and Environment
	CE620[4]	Research Methods
	CE631	Simulation and IT Applications in Construction
	CE632	Advanced Energy Technologies and Analytics
	CE633	Environment and Climate Change
	CE634	Urban Big Data
Departmental subjects		
Department of Building Environment and Energy Engineering (BEEE)	BSE6001	Computational Fluid Dynamics
	BSE6004	Fire Science and Fire Safety Engineering
	BSE6005	Indoor and Outdoor Environmental Quality Evaluation and Simulation
	BSE6101-6104[5]	Research Seminar I/II/III/IV
	BSE6105-6106[6]	Practicum I/II
Department of Building and Real Estate (BRE)	BRE666	Numerical Methods for Engineers
	BRE671-674[5]	Attendance in research seminars/workshops/conferences
	BRE675-676[6]	Practicum
Department of Civil and Environmental Engineering (CEE)	CSE6010	Nonlinear Finite Element Analysis of Structures
	CSE6011	Structural Performance Monitoring
	CSE6012	Advances in Geotechnical and Pavement Engineering
	CSE6013	Life Cycle Performance Management of Concrete Infrastructure
	CSE6014	Environmental Fluid Mechanics
	CSE6015	Transportation Optimization and Simulation Methods
	CSE6700-6703[5]	Attendance in Research Seminars/Workshops/Conferences 1/2/3/4
	CSE6710-6711[6]	Practicum 1/2
Department of Land Surveying and Geo-Informatics (LSGI)	LSGI631-634[5]	Attendance in Research Seminars/Workshops/Conferences I/II/III/IV
	LSG641-642[6]	Practicum I/II
	LSGI651	Advanced GNSS Technology and Applications
	LSGI652	Remote Sensing in Construction, Urban and Environment

Notes:

1. *English enhancement subjects for all RPg students. For exemption, RPg students need to pass the Research Language Skills Assessment (RLSA).*
2. *Compulsory Subjects for all PolyU RPg students.*
3. *Compulsory Subject for full-time FCE research students who registered on/after 2 July 2009, and part-time FCE research students who registered on/after 2 July 2014.*
4. *Compulsory Subject for full-time and part-time FCE research students who registered on/after 2 July 2014.*
5. *Attendance at Seminars is compulsory for all PolyU RPg students (Total 2 credits for MPhil students / Total 3 credits for 3-year PhD students / Total 4 credits for 4-year PhD students).*
6. *Practicum is compulsory for all PolyU PhD students.*

Financial Assistantship

http://www51.polyu.edu.hk/eprospectus/rpg

Hong Kong PhD Fellowship Scheme (HKPFS)

The Scheme, established by the Hong Kong Research Grants Council (RGC), aims to attract the best and brightest students in the world to pursue their PhD studies in Hong Kong. The Scheme calls for applications in September each year.

PolyU Presidential PhD Fellowship Scheme

The Scheme offers an attractive scholarship package, and aims to attract outstanding PhD applicants to support their research studies at PolyU and living expenses in Hong Kong.

Postgraduate Scholarship

With effect from academic year 2021/22, the "Research Studentship" is re-named as "Postgraduate Scholarship" which will be awarded by the respective DRC to eligible RPg students. The DRC will determine a period for which RPg students to receive a monthly stipend. Normally, the period for Scholarship will not exceed the normal period of study.

Conference Attendance Grant

All RPg students, irrespective of funding source, will be provided with Conference Grant during their studies at PolyU. They are allowed to make use of the Conference Grant up to the date of oral examination. There is no restriction on the number of times an RPg student can be supported by Conference Grant for conference attendance, as long as the total amount of Conference Grant allocated to the student throughout his/her studies does not exceed HK$25,000 (for awardees of the Hong Kong PhD Fellowship Scheme, the amount of conference grant is HK$13,600/year according to the regulations of the Scheme).

Selected Research Students / Graduates / Postdoctoral Fellows

Hong Kong PhD Fellowship Scheme Awardees in 2021-22

https://www.polyu.edu.hk/gs/prospective-students/hkpfs/

2021

Dept	Name of Awardee	Chief Supervisor	Nationality/Country
BEEE	DAI Mingkun	Prof. WANG Shengwei	China
	ZHANG Yijie	Prof. YANG Hongxing	China
BRE	FAN Siqi	Prof. Geoffrey SHEN	China
	YI Shu	Dr Tanya TAN	China
CEE	PATRIA Raffel Dharma	Dr Ben LEU	Indonesia
	SHEN Jiayang	Prof. Songye ZHU	China
	ZHANG Weijia	Prof. Yiqing NI	China
LSGI	ZHAO Shuheng	Dr Xiaolin ZHU	China
	SHI Fan	Prof. John SHI	China

2022

Dept	Name of Awardee	Chief Supervisor	Nationality/Country
BEEE	XIAO Ziwei	Prof. Linda XIAO	China
BRE	FARES Ali	Prof. Tarek ZAYED	Palestinian Territory
CEE	WANG Chang-ting	Dr Peng WANG	Taiwan Region
	WANG Xinyu	Dr Wei MA	China
	ZHU Qi	Prof. Yiqing NI	China
	WAN Zihan	Dr Wei MA	China
LSGI	LIU Denghong	Dr Xiaolin ZHU	China
	MAHMOUD Mostafa Mahmoud Hanafy	Prof. Wu CHEN	Egypt

Selected PhD Graduates in 2021-2022

Dept	PhD Graduate	Employment Record After Graduation		Thesis Title	Chief Supervisor	Graduation Year
		Institution (Country)	Position			
BEEE	HUANG Junchao	Midea Group (China)	Project Manager	Study on Novel Solar Photovoltaic Integrated Vacuum Glazing for Low-energy Buildings	Prof. Hongxing YANG	2021
	LI Wenzhuo	University College London (UK)	KTP Research Associate: Decarbonising Technologies	Optimal Control of Air-Conditioning Systems for Enhanced Indoor Environment and Energy Efficiency Using IoT-based Smart Sensors	Prof. Shengwei WANG	2021
	LIU Jia	Guangzhou University (China)	Associate Professor	Study on Hybrid Renewable Energy and Electrical Energy Storage Systems for Power Supply to Buildings in Urban Areas	Prof. Hongxing YANG	2021
	WANG Huilong	Shenzhen University (China)	Assistant Professor	Development of Advanced Control Technologies for Building HVAC Systems to Provide Frequency Regulation Service to Smart Power Grids	Prof. Shengwei WANG	2021
	YANG Da	Harbin Institute of Technology (China)	Assistant Professor	A Study of Speech Intelligibility and Indoor Environmental Assessment in Hong Kong Classrooms	Prof. Cheuk Ming MAK	2021
	ZHANG Yang	National University of Defense Technology (China)	Lecturer	Lightning Protection for Large-scale Photovoltaic Systems	Prof. Yaping DU	2021
	ZHOU Yuekuan	Hong Kong University of Science and Technology (HK, China)	Assistant Professor	Energy Planning and Advanced Management Strategies for an Interactive Zero-energy Sharing Network (Buildings and Transportations) with High Energy Flexibility and Electrochemical Battery Cycling Aging	Dr Sunliang CAO	2021
BRE	ABDUL-RAHMAN Mohammed	The Hong Kong Polytechnic University (HK, China)	Postdoctoral Fellow	A Community Resilience Assessment Framework for University Towns	Prof. Hon Wan Edwin CHAN	2022
	EKANAYAKE MUDIYANSELAGE Anushika C.E.	Birmingham City University (UK)	Lecturer in Quantity Surveying	Modelling Supply Chain Resilience in Industrialized Construction in Sri Lanka	Prof. Qiping SHEN	2021
	LIN Xuemei	The Hong Kong Polytechnic University (HK, China)	Postdoctoral Fellow	A Study of the Structural Performance of Bearing-type High Strength Steel Bolted Connections	Prof. Chi Ho Michael YAM	2022
	WAKIL Md Abdul	Rajshahi University of Engineering & Technology (Bangladesh)	Assistant Professor	Examining the Associations between Community Capitals and Residents' Well-being in Tourism Destination Community: A Case Study of Cox's Bazar, Bangladesh	Dr Yi SUN	2021
	ZHANG Boyu	China Academy of Building Research (China)	Manager	3D-Laser-Scan-Based Automated Assessment of Appearance Quality of Precast Concrete Components: A Standardized BIM Framework	Prof. Qiping SHEN	2022
CEE	ISLAM Md Khairul	University of Rajshahi (Bangladesh)	Assistant Professor	Strategic Organosolv Pretreatment toward Energy-Efficient Sugar and Lignin Utilization in Lignocellulose Biorefinery	Dr Shao Yuan LEU	2021
	TAN Yan	Qingdao University of Technology (China)	Associate Professor	Study on Oxygenated Volatile Organic Compounds (OVOCs) Formation and Impact in Hong Kong: A Combined Field Study and Chamber Simulation	Prof. Shuncheng LEE	2021
	FANG Xiaoliang	Ningbo University (China)	Associate Professor	Upcycling Waste Concrete Aggregates by Accelerated Carbonation	Prof. Chi Sun POON	2021
	HUANG Lei	Wenzhou University (China)	Associate professor	Influences of Anisotropic Spatial Variation of Soils and Sampling Strategy on Slope Reliability Evaluation	Dr Yat Fai LEUNG	2021
	CHEN Tiantian	Korean Advanced Institute of Science and Technology (South Korea)	Assistant Professor	Safety of Professional Drivers in Hong Kong	Dr Nang Ngai SZE	2021
	CHEN Sixin	Shantou University (China)	Lecturer	Generalizable Deep Learning for Structural Health Monitoring: from Graph Formulation to Domain Adaptation	Prof. Yiqing NI	2022
LSGI	AHMAD Ahmad Muhamad Senousi	Cairo University (Egypt)	Assistant Professor	Modelling High-Frequency City Using Multilayer Network Analysis	Prof. X.T. LIU	2021
	HE Zhenyu	Hohai University (China)	Lecturer	Improving the Performance of a GNSS Based Passive Radar for Maritime Surveillance	Prof. W. CHEN	2022
	TIAN Jiaqi	National University of Singapore (Singapore)	Postdoctoral Fellow	Improving the Reliability of Vegetation Phenology Detection from Satellite Time-series Data	Dr X.L. ZHU	2021
	ZOU Yajing	AutoX (China)	Localization Algorithm Engineer	RGB-D SLAM for Indoor Mobile Platform Based on Hybrid Feature Fusion and Wheel Odometer Integration	Prof. W. CHEN	2022

Selected Postdoctoral Fellows in 2021-2022

Dept	Name	Award Institution of PhD Degree (Country)	Project Title	Principal Investigator
BEEE	Dr GUO Fangzhou	Texas A&M University (USA)	Development of Big Data and AI-Enabled Energy Flexibility and Dynamics Prediction Models for Complex Building Energy Systems	Prof. Fu XIAO
	Dr KAZEMIAN Arash	Shanghai Jiao Tong University (China)	Numerical and Experimental Investigation of a Photovoltaic Thermal System Integrated with Phase Change Material	Prof. Hongxing YANG
	Dr LI Bingxu	Nanyang Technological University (Singapore)	Development of a Disturbance Compensation-based Frequency Regulation Control Strategy Engaging Variable-speed HVAC Devices for Smart Grid Instantaneous Power Balancing with Reduced Impact on Buildings	Prof. Shengwei WANG
	Dr LIANG Haobin	The University of Sydney (Australia)	High Performance Built Environment	Prof. Qingyan CHEN
	Dr SINGH Prateek Kumar	University of Liverpool (UK)	High Performance Built Environment	Prof. Qingyan CHEN
	Dr ZHANG Dadi	Delft University of Technology (The Netherlands)	A New Thermal Preference and Energy Consumption Model for the Optimal Bathroom Environment	Dr Ling Tim WONG
BRE	Dr XU Haoran	The Hong Kong Polytechnic University (HK, China)	Enabling the Dynamic Optimisation of Solid Oxide Electrolysers in the Lifespan for Low-carbon Fuel Generation	Prof. Meng NI
	Dr GUAN Daqin	Nanjing Tech University (China)	Sustainable Electrocatalytic Production of C/N/O/H-containing Chemicals and Fuels on Perovskite Oxides	Prof. Meng NI
	Dr HUSSEIN FARH Hassain M.	Universiti Teknologi Malaysia (Malaysia)	Modeling and Analysis of Water Pipe Failure: Investigate Causes, Find Solutions, and Develop Potential Strategies, Polices, and Regulations	Prof. Tarek ZAYED
	Dr ZHANG Fan	Southeast University (China)	Evaluating and Promoting Healthy Residential Buildings for Aged Residents through Smart Approaches in High-density Cities	Prof. Albert CHAN
	Dr LIU Tong	University of Science and Technology of China (China)	基於稀土鹵化物電解質的全固態鋰空氣電池研究	Prof. Meng NI
CEE	Dr FAN Meiyi	Nanjing University of Information Science and Technology (China)	Sources, Chemical Ageing, and Climate Consequence of Organic Aerosols in Offshore Marine Atmosphere of Eastern and Southern China	Prof. H. GUO
	Dr XUAN Qingdong	University of Science and Technology of China (China)	Emerging Civil Engineering Materials and Structures	Prof. J.G. DAI
	Dr LI Yixian	Tongji University (China)	Integrated Smart Operation and Maintenance Technologies for Hong Kong-Zhuhai-Macao Bridge	Prof. Y. XIA
	Dr TANG Yanfei	Tongji University (China)	Food Waste Upcycling into Value-added Products	Prof. Daniel TSANG
	Dr Arun Krishna VUPPALADADIYAM	Tsinghua University (China)	Construction of a Metabolite Driven Solvent-Catalytic Biorefinery System for Lignin Valorization from Refuse-Derived Biomass	Dr S.Y. LEU
	Dr WANG Mengmeng	Tsinghua University (China)	Research on the Sustainability of Spent Lithium-ion Battery Recycling Technology	Prof. Daniel TSANG
LSGI	Dr Chaitamart Jittin	The Hong Kong Polytechnic University (HK, China)	Development of a Strategic Focus Area (SFA) in Utility System Research	Prof. Xiaoli DING
	Dr Li Yaxin	The Hong Kong Polytechnic University (HK, China)	Enhance Performance of HK GNSS Positioning Infrastructure with Beidou III and other GNSS Constellations	Prof. Wu CHEN
	Dr Mohammad Pir	Indian Institution of Technology (India)	Global STEM Professorship - Prof. Qihao Weng	Prof. Qihao WENG
	Dr Wang Yiran	The Hong Kong Polytechnic University (HK, China)	Mapping and Characterization for Optimized Evaluation of Potential Landing Sites on the Moon and Mars to Support Future Missions	Prof. Bo WU
	Dr Yoo Cheolhee	Ulsan National Institute of Science and Technology (South Korea)	Global STEM Professorship - Prof. Qihao Weng	Prof. Qihao WENG

Scholarly Events

Department	Date	Titles	Venue
BEEE	17 Nov 2021	Hong Kong Joint Symposium 2021: New Generation and Technology Application for Future Engineering Challenge	Hong Kong
	28 Dec 2021	HK YMS: Gov't Projects with Adoption of Multi-trade Integrated MEP & Modular Integrated Construction	Hong Kong
	23 Nov 2022	Hong Kong Joint Symposium 2022: City for Future	Hong Kong
	24 Nov 2022	Shenzhen-Hong Kong Exchange Conference on Eco Environmental Science and Technology Innovations 2022	Hong Kong
	29 Nov - 2 Dec 2022	12th International Conference on Structures in Fire	Hong Kong
BRE	9 Jan 2021	Distinguished Talk on Real Estate Industry Professionals - A Journey on the Industry Development and What's Needed for the Future	Online
	6 Mar 2021	Distinguished Talk on the Magic of Construction Innovations	Online
	24 Apr 2021	BRE Distinguished Lecture on the Future is on the Horizon – Producing Land by Reclamation	Online
	30 Nov 2021	BRE Distinguished Lecture on Reshaping of the Hong Kong Construction Industry	Hong Kong (Hybrid)
	6-7 Dec 2021	AFGS 2021: The 13th Asian Forum on Graphic Science (Webinar)	Online
	18 Feb 2022	BRE Distinguished Lecture: Northern Metropolis - Opportunities for Making of an Innovation and Technology Industry Eco-system	Hong Kong (Hybrid)
CEE	27 Jan 2021	Seminar on From Research to Publication	Online
	18 May 2021	Seminar on Infrastructure Maintenance, Renovation and Management - R&D Governmental Programme in Japan	Online
	7 Jan 2022	International Symposium on Soft Ground and Smart Geotechnology (co-organized with RILS)	Online
	29 – 30 Mar 2022	International Webinar on Valorization of Waste Incineration Residues in Construction (co-organized with RCRE and ISCOWA)	Online
	2021-22	PolyU CEE Webinar Series 2021-22	Online
LSGI	8 Jul 2021	Seminar on Research at the Urban Analytics Lab at the National University of Singapore	Online
	22 Jul 2021	Seminar on Earth Greening and the Vegetation-energy-carbon Nexus	Online
	30 Jul 2021	Seminar on Addressing the Uncertain Geographic Context Problem by Accurately Delineating Environmental Context in Space-time and Assessing Individual Exposure with GIS and GPS	Online
	6 Aug 2021	Seminar on Applying Geospatial Data Science Techniques in Urban and Health Research	Online
	19 Aug 2021	Seminar on Representing and Visualizing Interpersonal Relationships and Social Life as Geospatial Data	Online
	27 Aug 2021	Seminar on The Practice of City Information Modeling for Urban Governance	Online
	18 Nov 2021	Seminar on Urban Morphology and Traffic Congestion	Online
	24 Nov 2021	Seminar on Remote Sensing of Urban Impervious Surfaces in Tropical and Subtropical Areas	Hong Kong (Hybrid)
	2 Dec 2021	Seminar on Generating 3D Semantic Building Models Using Crowdsourcing Street-level Image Data	Online
	16 Dec 2021	Seminar on Applying Data Science Methods to Measure and to Evaluate the Urban Design of Our Cities	Online
	20 Dec 2021	Seminar on Water Vapor, Clouds, and Convective Storms in the Atmosphere	Hong Kong (Hybrid)
	28 Jan 2022	Seminar on A New Method for Identifying Built-up Areas Using Night-time Light Data - A Case Study of 600+ Chinese Cities	Online
	11 Feb 2022	Seminar on Active Hope in the Changing World: Geospatial Approaches to Enhancing Disaster and Pandemic Resilience	Online
	18 Feb 2022	Seminar on Urban Visual Intelligence: Perceiving Cities with AI and Street-level Imagery	Online
	25 Feb 2022	Seminar on Exploring Socio-spatial Inequalities in Urban Mobility	Online
	25 Mar 2022	Seminar on Towards Large-scale Assessments of Coastal Risks in View of Climate Change	Online
	28 Mar 2022	Seminar on a Journey of Extending the Horizon of Positioning and Mapping Technology from Forestry to Smart Construction	Online
	7 Apr 2022	Seminar on Using a Multiscalar GRACE-based Standardized Terrestrial Water Storage Index for Drought Assessment	Online
	4 May 2022	Seminar on the Impacts of Public Health Interventions and Weather Conditions on Controlling COVID-19 Outbreaks in Hong Kong: Using Modelling Approaches	Online
	29 Jul 2022	Seminar on a Computational Geography Approach to Understanding Human-urban Environment Interactions	Online
	2 Sep 2022	Seminar on Geodetic and Remote Sensing Observations of Thawing Permafrost	Hong Kong
	16 Sep 2022	Seminar on Urban Cellular Automata Modelling: Applications, Challenges and Future Research	Online
	23 Sep 2022	Seminar on Crowdsourcing Geospatial Data in Urban Sciences: Progress and Challenges	Online
	28 Sep 2022	Seminar on Regional Integration in the Horn of Africa: An Inter City Connectivity Perspective	Hong Kong
	30 Sep 2022	Seminar on When GIS Meets COVID 19: Digital Health Geography at the National and Global Level	Online
	5 Oct 2022	Seminar on History of Climate and Society: Exploring the Archives of Societies in China	Hong Kong
	12 Oct 2022	Seminar on Citizens on the Map	Online
	17 Oct 2022	Seminar on Towards Deep Visual Scene Understanding	Online

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