



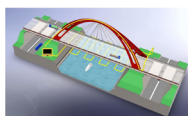
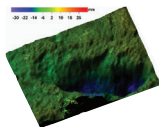
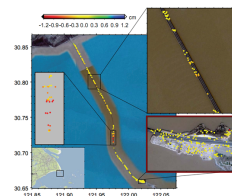
THE HONG KONG  
POLYTECHNIC UNIVERSITY  
香港理工大學



2019

# RISUD

可持續城市發展研究院  
RESEARCH INSTITUTE  
FOR  
SUSTAINABLE URBAN DEVELOPMENT



Innovative Solutions for Sustainable Cities



## Message from the Council Chairman

With a steadily rising world population and the limited space available on our planet, sustainable development remains a pressing global issue. The Hong Kong Polytechnic University (PolyU) responded proactively to the issue of urban sustainability by establishing the Research Institute for Sustainable Urban Development (RISUD) in 2012.



In the belief that innovation is the key to development, RISUD has made several notable strides over the past seven years, engaging in various knowledge transfer activities by collaborating with industry and government. The Institute has also brought together multi-disciplinary experts in PolyU, leading to the conduct of cutting-edge research into solutions to problems generated by high-density urban development.

“To learn and to apply, for the benefit of mankind” remains PolyU’s motto, and one way in which we hope to continue fulfilling it is through our contributions to local and international sustainable development.

A handwritten signature in black ink, which appears to read 'Tai-Fai Lam'.

**Dr Tai-Fai Lam, SBS, JP**  
**Council Chairman**  
**The Hong Kong Polytechnic University**

## Message from the President

Hong Kong is one of the most densely populated metropolises in the world, with around 7.5 million people living on just 1,107 square kilometers of hilly land. The city is characterized by high-rise residential blocks comprised of relatively small flats, creating an urban living environment not commonly found in other developed regions. High-density urban development brings with it both opportunities and challenges. Air pollution, heat island effects, solid waste management, aging infrastructure and shortages in housing supply are just some of the issues with which we have long contended. Along the way, we have accumulated extensive experience and expertise that can be shared with many developing cities around the world as they become increasingly like Hong Kong. In addition, Hong Kong serves as a living laboratory for the study of technologies and systems that are indispensable for the development of sustainable cities.



Against the above background, the Research Institute for Sustainable Urban Development (RISUD) was established by The Hong Kong Polytechnic University (PolyU) in 2012 to develop sustainable solutions for problems generated by high-density urban development. The Institute now includes researchers from a wide range of disciplines who are engaged in multi-disciplinary, cutting-edge research and associated knowledge transfer activities. The activities of RISUD reflect well the values embedded in the motto of PolyU: To learn and to apply, for the benefit of mankind. Indeed, PolyU sees it as its obligation to foster the sustainable development of Hong Kong as well as other high-density cities in mainland China and other parts of the world.

RISUD has come a long way over the past seven years, and I wish it even greater achievements in the next stage of development. I am confident that with the continued support of both industry and community, RISUD will scale new heights in the years to come.

A handwritten signature in black ink, appearing to read 'JGTeng', written over a faint background image of the Polytechnic University campus.

**Professor Jin-Guang Teng**  
**President**  
**The Hong Kong Polytechnic University**

## Message from the Vice President (Research Development)

With urban population in the Asia-Pacific region totaling 1.4 billion and expected to rise to 2 billion by 2020, sustainable development has become a very important subject to the future of cities in the Asia-Pacific region and the world at large. Some cities are on track to becoming fully sustainable and many will have their own research centers to develop renewable energy and clean environmental technologies. In view of the rapid urbanization and growing pressures on natural resources, there is an urgent need for coordinated action on urban sustainability. Only if national, regional and local governments work together with public institutions, business, industry, and other stakeholders will we be able to reach the goal of fully sustainable cities.



Hong Kong, a city of high population density, is in a very good position to conduct research on urban sustainability as well as promote and facilitate the transfer of environmentally sound technology and expertise in support of local governments, particularly the Mainland, in the implementation of sustainable urban development plans and strategies. "Sustainable development in Hong Kong balances social, economic, environmental and resource needs, both for present and future generations simultaneously achieving a vibrant economy, social progress and a high quality environment, locally, nationally, and internationally through the efforts of the community and the Government." – defined in the Study on Sustainable Development for the 21<sup>st</sup> Century (SUSDEV 21), a study commissioned by the Hong Kong Government in 1997.

Sustainable urban development is one of the strongest research areas in PolyU. We hope the Research Institute for Sustainable Urban Development (RISUD) can cope with the needs of the society in Hong Kong and the Region. With its mission to (i) create sustainable solutions to problems generated by high-density urban development through multi-disciplinary, cutting-edge research; (ii) engage in knowledge transfer activities through specialist consultancy and continuing professional training; and (iii) create significant positive impact on government policies and societal culture for sustainable urban development through services to professional and government organizations; as well as the support from the University, we are confident that the RISUD will become a world leader in the development and dissemination of technologies and systems for sustainable high-density urban development.

A handwritten signature in black ink, reading "Alexander Wai". The signature is fluid and cursive, with the first name "Alexander" and the last name "Wai" clearly distinguishable.

**Professor Ping-Kong Alexander Wai**  
**Vice President (Research Development)**  
**The Hong Kong Polytechnic University**



## Message from the Director

With the rapid pace of urban development all over the world, understanding the dynamic interactions between human activities and the urban environment is more important than ever. Particularly for a high-density metropolis like Hong Kong, which is facing a range of issues, from air pollution to heat island effects to aged buildings and nature conservation under global climate change, it is imperative that we harness our accumulated experience and expertise on urban development over the last 50 years to ensure its long term sustainable development.



Supporting our efforts to address these critical issues and committed to its motto of “To learn and to apply, for the benefit of mankind”, The Hong Kong Polytechnic University (PolyU) has facilitated the sustainable development of Hong Kong as well as other high-density cities in mainland China and other parts of the world through research and knowledge transfer activities.

The Research Institute for Sustainable Urban Development (RISUD) was established by PolyU in 2012 to seize the opportunity for a world-leading role in this area. While RISUD was initially nurtured primarily by researchers from the Faculty of Construction and Environment (FCE), it has since expanded to include a significant number of active researchers from other departments of the university. We also build close collaborations with government agencies, industrial partners and local universities via the university-government-industry (UGI) consortium, and establish international networks through an annual international symposium and other activities.

With the successful operation of RISUD in the last seven years, we are ready to advance sustainable urban development research to the next level with large-scale projects and innovative ideas, transforming our cities in the process.

We look forward to working with you on sustainable urban development in the future.

A handwritten signature in black ink, appearing to read 'Xiang-Dong Li'.

**Professor Xiang-Dong Li**  
**Director of RISUD**

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## Introduction

As a result of the rapid economic development on the Chinese mainland, a massive urbanization process has been under way. Over the next 25 years, it is estimated that around 300 million rural dwellers in China will become urban residents. The scale of this process is unprecedented in human history, and the challenge is how to achieve it in a sustainable manner so that the natural environment is well protected and the built environment functions in an efficient manner in terms of energy and resources.

This massive urbanization process in China presents many opportunities for Hong Kong because many mainland cities are developing according to Hong Kong's high-density urban development model. Such cities are characterized by a great number of high-rise residential buildings and present many unique challenges for both construction and management.

Against the above background, the Research Institute for Sustainable Urban Development (RISUD) was established by The Hong Kong Polytechnic University (PolyU) to develop innovative solutions for sustainable high-density cities by capitalizing on the living laboratory of Hong Kong's urban environment and the multidisciplinary expertise of PolyU.

## Our Vision

To be a world leader in the development and dissemination of innovative solutions for sustainable high-density urban development.

## Our Mission

- To create innovative solutions to problems generated by high-density urban development through multi-disciplinary, collaborative research;
- To engage in knowledge transfer activities by collaborating with industry and government; and
- To make an impact on societal cultures of urban sustainability through community engagement and services.

# Organizational Structure and Research Areas

RISUD is led by Prof. Xiang-dong LI as Director and Prof. Albert P. C. CHAN as Associate Director. It includes 36 research groups which are organized into five divisions.

The 36 research groups of RISUD are each led by a senior researcher who is an internationally recognized scholar in the area. The research groups, as the nodes of a dynamic interactive network, organize themselves by common interest to form strong teams for major multi-disciplinary research projects to advance the frontiers of knowledge and technologies. The five divisions and the research groups under each division are listed below.

## **Division of Urban Systems** (Coordinator: Prof. Geoffrey Q. P. SHEN)

- Smart Construction (Group Leader: Prof. Heng LI)
- Sustainable Construction (Group Leader: Prof. Geoffrey Q. P. SHEN)
- Sustainable Land Use (Group Leader: Prof. Edwin H. W. CHAN)
- Sustainable Public Design (Group Leader: Prof. Kin Wai Michael SIU)
- Sustainable Transportation Systems (Group Leader: Prof. William H. K. LAM)
- Sustainable Urban Design (Group Leader: Dr Peter HASDELL)
- Urban Housing Policies (Group Leader: Prof. Eddie C. M. HUI)

## **Division of Urban Infrastructure** (Coordinator: Prof. Asif Sohail USMANI)

- Advanced Composites and Technology (Group Leader: Prof. Limin ZHOU)
- Construction Health and Safety (Group Leader: Prof. Albert P. C. CHAN)
- High-speed Railway Safety (Group Leader: Prof. Yi-qing NI)
- Infrastructural Monitoring (Group Leader: Prof. Yi-qing NI)
- Sustainable Materials and Structures (Group Leader: Prof. Jin-guang TENG)
- Urban Geo-Hazards (Group Leader: Prof. Jian-hua YIN)
- Urban Fire Safety (Group Leader: Prof. Asif Sohail USMANI)
- Multi-functional Coating Materials for Infrastructure and Building Sustainability (Group Leader: Prof. Jian-guo DAI)

## **Division of Urban Environment** (Coordinator: Prof. Tao WANG)

- Corporate Environmental Management (Group Leader: Prof. Eric W. T. NGAI)
- Environmental Energy (Group Leader: Prof. Meng NI)
- Nano-materials for the Environment (Group Leader: Prof. Pauline Pei LI)
- Regional Air Quality (Group Leader: Prof. Tao WANG)
- Sustainable Waste Management (Group Leader: Prof. Chi-Sun POON)
- Urban Ecosystems (Group Leader: Prof. Xiang-dong LI)
- Urban Noise Mitigation (Group Leader: Prof. Shiu-keung TANG)
- Urban Water and Wastewater Treatment (Group Leader: Prof. Wei CHU)
- Energy Conversion Materials (Group Leader: Prof. Raymond W. Y. WONG)

## **Division of Green Buildings** (Coordinator: Prof. Hong-xing YANG)

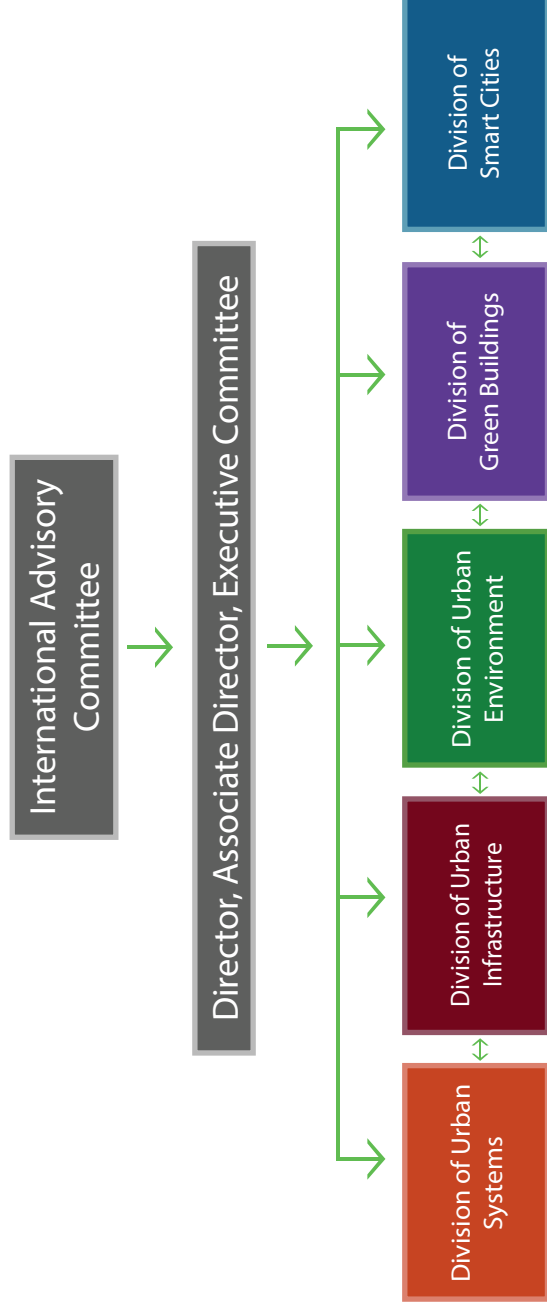
- Building Energy and Automation (Group Leader: Prof. Shengwei WANG)
- Building Thermal Environment and Urban Climate (Group Leader: Prof. Jian-lei NIU)
- Environmental and Energy Economics (Group Leader: Dr David BROADSTOCK)
- Indoor Air Quality (Group Leader: Prof. Shun-cheng LEE)
- LED Based Energy Efficient Communication Systems (Group Leader: Dr Chang-yuan YU)
- Renewable Energy (Group Leader: Prof. Hong-xing YANG)

## **Division of Smart Cities** (Coordinator: Prof. Xiao-li DING)

- Geo-spatial Technology in Urban Development (Group Leader: Prof. John W. Z. SHI)
- Management of Underground Utilities (Group Leader: Prof. Wu CHEN)
- Internet Service Monitoring and Diagnostics (Group Leader: Dr Rocky K. C. CHANG)
- Unmanned Airborne System for Urban Monitoring (Group Leader: Prof. Chih-Yung WEN)
- Urban Big Data Computing and Wireless Networking (Group Leader: Prof. Jiannong CAO)
- Urban Navigation and Mobility (Group Leader: Prof. Xiao-li DING)



## Organization Chart of RISUD



# Multi-Disciplinary Research in Focus Areas

## **Strategic Focus Area (SFA) Scheme**

The Strategic Focus Area (SFA) Scheme, launched in June 2016, aims to support the emergence/growth of a significant number of focus areas of strategic importance which are well aligned with the mission of RISUD. The SFAs are the main vehicle through which RISUD will deliver its research as well as its collaborative and scholarly activities over its current development stage.

The 10 funded SFAs are listed as follows:

1. Industrialization of Building Construction (IBC)
2. Offshore Wind Power Generation
3. Robotics for Urban Infrastructure
4. Smart Energy Efficient and Grid-Responsive Buildings
5. Smart Utilities
6. Urban Air Pollution and Health
7. Urban Ecology
8. Urban Water Management
9. Very Large Floating Structures
10. Urban Simulation

## Partnerships with Industry and Society

RISUD provides services to industry and society through knowledge transfer activities. Such activities aim to address major societal issues using a multi-disciplinary approach, thereby contributing directly to Hong Kong's competitiveness as a world-class metropolis and to the socio-economic development of China as a whole as well as the rest of the world. Therefore, partnerships with industry and society for collaborative research and knowledge transfer are highly valued and vigorously pursued by RISUD. Members of RISUD have had extensive experience and success in knowledge transfer. Their success stories include the development of energy-saving strategies for the International Commerce Centre and the turning of wastes into a new type of brick known as the Eco-block, which has been used in many projects in Hong Kong.

## Other Scholarly Activities

Members of RISUD are encouraged to engage in a wide range of scholarly activities such as organizing international conferences and workshops, offering short training courses for local professionals, and delivering seminars to disseminate the latest research outcomes. It is expected that these activities will create a positive impact on public opinions and policies.

## Research Achievement

In addition to competing funds allocated by RISUD, RISUD members apply for fundings from external sources, either through competitive or non-competitive means, for their research projects. The followings are the coveted external fundings won by RISUD members:

### Theme-based projects (TRS)

Since the Research Grants Council (RGC) Theme-based Research Scheme (TRS) launched in 2011/12, PolyU has had 2 projects funded by this highly competitive scheme in 2017/18 and 2018/19. Both the 2 projects are multidisciplinary projects led by RISUD members, with the theme of developing a sustainable environment.

| Project Title  | Project Leader  | Funding Amount      | Awarded Year           |
|--|---|---------------------|------------------------|
| Sustainable Marine Infrastructure Enabled by the Innovative Use of Seawater Sea-Sand Concrete and Fibre-Reinforced Polymer Composites  | Prof. Jin-guang TENG<br>[Leader of Research Group for Sustainable Materials and Structures] | Over HK\$47,000,000 | 2018/19<br>(8th round) |
| Photochemical Air Pollution in Highly Urbanized Subtropical Regions: from Micro Environments to Urban-terrestrial-oceanic Interactions | Prof. Tao WANG<br>[Leader of Research Group for Regional Air Quality]                       | Over HK\$33,000,000 | 2017/18<br>(7th round) |

### The Hong Kong Jockey Club Charities Trust

| Project Title                                  | Project Leader  | Funding Amount | Project Duration      |
|--|---|----------------|-----------------------|
| Jockey Club Smart City Tree Management Project | Dr Charles WONG<br>[Member of Research Group for Geo-spatial Technology in Urban Development] | HK\$32,000,000 | 21 Feb 18 – 20 Feb 21 |

### Research Group for Smart Construction

Group Leader: Professor Heng LI

Phone no.: (+852) 2766 5879

Email: heng.li@polyu.edu.hk



Professor Li has established an international reputation in the area of construction management research through developing innovative IT solutions to enhance project delivery processes. He probably holds the highest record of journal papers and citations in his research field. His recent research interest has been developing the construction of virtual prototyping technology. Virtual Prototyping or VP technology enables contractors to identify construction problems and explore possible solutions and improvements to a construction plan before the actual work begins. His future research plan is to develop innovative solutions to transfer the construction industry to the digital age.

### Research Group for Sustainable Construction

Group Leader: Professor Geoffrey Q. P. SHEN

Phone no.: (+852) 2766 5817

Email: bsqpshen@polyu.edu.hk



Professor Geoffrey Shen has a proven track record in academic and research leadership in construction management, with a special interest in value management, sustainable construction, and collaborative working supported by information and communication technologies. He pioneered the development of an innovative Interactive Value Management System, which utilizes group decision support technologies to improve the effectiveness and efficiency of value management workshops in construction. He has led a large number of research projects which have received a total of over HK\$50 million in funding, having notably earned five RGC-CERG grants in a row since 2002/03, and has authored more than 400 publications, including 200+ papers in academic and professional journals and 30+ scholarly books and research monographs. He has been invited to deliver keynote presentations for a number of international events, as well as chaired or co-chaired major international conferences. He teaches extensively in these fields at both postgraduate and degree levels, and has successfully supervised countless PhD and MPhil students. Professionally, he is a Fellow and Past President of the Hong Kong Institute of Value Management and an Eminent Fellow of the Royal Institution of Chartered Surveyors.

## Research Group for Sustainable Land Use

Group Leader: Professor Edwin H. W. CHAN

Phone no.: (+852) 2766 5800

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Professor Edwin Chan studied Architecture in England and then learnt Law in London and Hong Kong. He has carried out a wide range of research relating to urban development including sustainability policies for urban environment, urban renewal/ heritage conservation, low-carbon cities, healthy/green building, institutional analysis and transaction costs for “green” promotions, dispute management, and community issues. He has published his work in over 100 international SSCI/SCI journal papers and many book chapters. He serves as an editor or editorial board member of several research journals, and has edited many books related to his research. To enrich teaching/research that is relevant to the industry, he plays active roles in professional bodies and has served on a number of government boards/committees, including the Town Planning Board and the Housing Authority. Recently, he has focused his research efforts on sustainability issues in urban renewal/heritage conservation as well as policies for compact cities and the promotion of sustainable buildings.

## Research Group for Sustainable Public Design

Group Leader: Professor Kin Wai Michael SIU

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Email: m.siu@polyu.edu.hk



Prof. Kin Wai Michael Siu is a professional designer and chartered engineer. He has conducted research on public design. He has published 25 research monographs and over 250 journal papers in respective journals, including Design Issues, The Design Journal, Landscape and Urban Planning, Facilities, Applied Ergonomics, and the Journal of Engineering Design. He has solely owned over 50 international and US patents and design registrations related to public facilities and street furniture. He has received over 50 US /international design and invention awards, including the Red Dot, D&AD, Good Design, Geneva Expo Industrial Design Prize, JIPA Industrial Design, and Crystal Cabin Awards. He was awarded the HK UGC Humanities and Social Sciences Prestigious Fellowship Scheme in 2016/2017. He has been a Fulbright Scholar at the Massachusetts Institute of Technology, an ASIA Fellow at the National University of Singapore, and visiting professor/scholar at the University of California in Berkeley, the University of Cambridge, Tsinghua University, and the Central Academy of Fine Arts. He focuses his work on user reception, everyday space, inclusive design, and FlexiDesign. His current research projects include the public policy of public space, street furniture for densely populated urban areas and inclusive recycling facilities. His recent design, FlexiBOL®, has been well received by the Highways Department and widely installed in the urban areas of Hong Kong for flexible management of circulation.



## Research Group for Sustainable Transportation Systems

Group Leader: Professor William H. K. LAM

Phone no.: (+852) 2766 6045

Email: [william.lam@polyu.edu.hk](mailto:william.lam@polyu.edu.hk)



Professor William H.K. Lam is a Chair Professor of Civil & Transportation Engineering and has been the Head of the Department of Civil and Environmental Engineering (CEE) at The Hong Kong Polytechnic University since 2013. He is also an Honorary Professor at the Institute for Transport and Logistics Studies in The University of Sydney, Australia. He was appointed as Chang Jiang Chair Professor at the Beijing Jiaotong University in 2010, and held the post until 2016. Professor Lam has over 35 years of professional experience in research and practice for the planning and design of transport infrastructures. He is the founding Editor-in-Chief of the SCI Journal – Transportmetrica and is now one of the Editors-in-Chief of Transportmetrica A: Transport Science (<https://www.tandfonline.com/toc/ttra21/current>). Professor Lam is the Convenor of the International Advisory Committee of the International Symposium on Transportation and Traffic Theory (<https://isttt23.sciencesconf.org/>), a member of the International Scientific Committee of the International Symposium on Transportation Network Reliability (INSTR) ([www.instr.org](http://www.instr.org)) and the President of the Hong Kong Society for Transportation Studies ([www.hksts.org](http://www.hksts.org)). He is currently the Council Member of the Hong Kong Institution of Engineers (HKIE) ([www.hkie.org.hk](http://www.hkie.org.hk)), and was also the past Chairman of Logistics and Transportation Division of the HKIE in 2014/15 and the past Chairman of Civil Division of the HKIE in 2002/03. Professor Lam is the author of more than 300 ISI journal and conference proceedings papers and a further 70 consultancy reports. His research interests include transport planning and traffic forecasting, transport network modeling and reliability analysis, traffic surveys and simulation, Intelligent Transportation Systems (ITS) technology and planning, public transport and pedestrian studies ([www.cee.polyu.edu.hk/~cehklam](http://www.cee.polyu.edu.hk/~cehklam)).

## Research Group for Sustainable Urban Design

Group Leader: Dr Peter HASDELL

Phone no.: (+852) 2766 5476

Email: [sdpeterh@polyu.edu.hk](mailto:sdpeterh@polyu.edu.hk)



Peter Hasdell is an Associate Professor and Discipline Leader of the Environment and Interior Department. A registered architect, he graduated from the Architecture Association School of Architecture in London and the University of Sydney, holding degrees in both Computing and Architecture. He has extensive experience in urban planning, urban design, spatial planning, regional and strategic planning, land use, scenario development, gameboard simulation and urban development. He has practiced extensively as an architect and urbanist in Europe and Asia and has taught and researched in these fields since 1995 at the Bartlett School, UCL London, University of East London, Columbia University, NY, KTH, Stockholm, Berlage Institute, NL, and Manitoba, Canada. He has worked, researched and collaborated with several other architects, including Peter Cook, Raoul Bunschoten, Peter Salter, John Hejduk and Mark West, among others. Before taking up his current position, he served as a key researcher for the influential CHORA Institute of Architecture and Urbanism in London (1995-2001) and the Centre for Architecture Structures and Technology (C.A.S.T) in Manitoba (2004-2008) in addition to acting as Initiator and Director for the Architecture and Urban Research Lab (A+URL) in Stockholm (1999-2003). He has been the recipient of numerous awards, including European Union funding two times. With over 30 years' urban experience, he has advised, researched, consulted and developed urban propositions for cities, regions and urban authorities across Europe, with notable locations including London, Stockholm, Oslo, Rotterdam, Manchester, Bucharest, and Brussels, among others. His primary research focuses on the metabolic architecture on the scales of the city (city as a life form, urban ecology), and as architecture (interactive and responsive architectures). Urban related books include Border Ecologies (Birkhauser 2016), Urban Flotsam (010, 2001).

**Research Group for Urban Housing Policies****Group Leader: Professor Eddie C. M. HUI**

Phone no.: (+852) 2766 5881

Email: [bscmhui@polyu.edu.hk](mailto:bscmhui@polyu.edu.hk)

Prof. Hui obtained his MPhil and PhD at Cambridge University. He has served the community in various capacities, holding or having previously held posts on the following boards: the Long Term Housing Strategy Steering Committee, Town Planning Board, Metro Planning Committee, Rural and New Town Planning Committee, Real Estate Services Training Board, Buildings Appeal Tribunal, Securities and Futures Commission (REITs), Property Management Services Authority, Hong Kong Housing Society, and Urban Renewal Authority. Regarding his research, Prof Hui's work is dedicated to land, construction and real estate issues on both a local and international scale. His scholarly work has been published in reputed international journals, such as Applied Geography, Journal of Real Estate Finance and Economics, Urban Studies, Journal of Urban Affairs, Transportmetrica, International Real Estate Review, Housing Studies, Housing Economics, Journal of Real Estate Portfolio Management, Journal of Real Estate Literature, Journal of Property Investment and Finance, Property Management, Construction Management and Economics, Journal of Urban Planning and Development, International Review of Economics and Finance, Journal of Housing and the Built Environment, Habitat International, Cities, Land Use Policy, Building and Environment, Landscape and Urban Planning. In addition to his roles on the editorial boards, Prof Hui serves as Chief Editor/Guest Editor for a number of international journals, and also as a Director for the Asian Real Estate Society and Global Chinese Real Estate Congress. In 2015, he was awarded a Medal of Honour (MH) by the Chief Executive HKSAR to recognize his significant contribution to society in the field. Besides from being the Fellow of Cambridge University Trust, he was appointed by the University of Cambridge (Department of Land of Economy) as their (honorary) Associate in July 2018. Prof. Hui has been invited to speak as a visiting/honorable professor by many renowned universities.

## **Research Group for Advanced Composites and Technology**

Group Leader: Professor Limin ZHOU

Phone no.: (+852) 2766 6663

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Prof. Limin Zhou received his BEng and MEng from the Harbin Institute of Shipbuilding Engineering (current name: Harbin Engineering University) in 1982 and 1988 respectively, and his PhD from The University of Sydney in 1994. He was appointed as an Assistant Professor in 1996 and became a Professor in 2005 in the Department of Mechanical Engineering at The Hong Kong Polytechnic University. Prof. Zhou's major research interests include fibre-reinforced polymer composites, smart materials and structures, nanomaterials and nanotechnology for energy storages and conversions, and guided-wave based structural health monitoring techniques. He has published more than 250 technical articles including over 170 SCI refereed journal papers. After assuming his current post at The Hong Kong Polytechnic University, he received an Engineering Faculty Best Research Award in 1999 and the President's Award for Outstanding Achievements in Research in 2000. Prof. Zhou is currently a Vice President of the Chinese Society for Composite Materials and a member of the Engineering Panel for the Hong Kong Research Grants Council.

## **Research Group for Construction Health and Safety**

Group Leader: Professor Albert P. C. CHAN

Phone no.: (+852) 2766 5814

Email: bsachan@polyu.edu.hk



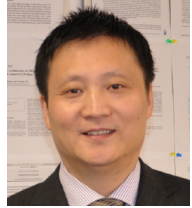
A Chartered Construction Manager, Engineer, Project Manager, and Surveyor by profession, Ir Prof. Chan has worked in a number of tertiary institutions, with some residing in Hong Kong while others lie overseas. Ir Prof. Chan joined the Department of Building and Real Estate of the Hong Kong Polytechnic University in 1996 and is currently the Head of Department of Building and Real Estate and the Associate Director of Research Institute for Sustainable Urban Development. Ir Prof. Chan's research and teaching interests include project management and project success, construction procurement and relational contracting, construction management and economics, construction health and safety, and construction industry development.

## Research Group for High-speed Railway Safety Research Group for Infrastructural Monitoring

Group Leader: Professor Yi-qing Ni

Phone no.: (+852) 2766 6004

Email: ceyqni@polyu.edu.hk



Prof. Ni is a Professor at the Department of Civil and Environmental Engineering in The Hong Kong Polytechnic University, the Director of the National Rail Transit Electrification and Automation Engineering Technology Research Center (Hong Kong Branch) and the Chief Research Officer of the PolyU-CSR Joint Innovation Center for Rail Transit Safety Monitoring Technology.

Prof. Ni is a council member of the International Society for Structural Health Monitoring of Intelligent Infrastructure (ISHMII) and a co-chair of the International Structural Health Monitoring (SHM) Guidelines Standing Committee, ISHMII. He serves as an associate editor of Journal of Vibration and Control and an editorial board member for four refereed journals: Structural Control and Health Monitoring, Advances in Structural Engineering, Advanced Steel Construction, and Structural Monitoring and Maintenance. He has published over 170 SCI journal papers with an H-index of 34, and more than 280 international conference papers. He is a recipient of the 2017 “SHM Person of the Year” Award by the international journal Structural Health Monitoring during the 11th International Workshop on Structural Health Monitoring in 2017 and the 2016 State Scientific and Technological Progress Award (Second Class), China. His “Mega-Structure Diagnostic and Prognostic System” received a Gold Medal and a Grand Prize at the 37th International Exhibitions of Invention, New Techniques and Products in Geneva in 2009, and his “Intelligent Ship-Bridge Anti-Collision Surveillance System” received a Gold Medal and a Grand Prize at the 41st International Exhibitions of Invention, New Techniques and Products in Geneva in 2013.

## Research Group for Sustainable Materials and Structures

Group Leader: Professor Jin-guang TENG

Phone no.: (+852) 2766 6012

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Professor Jin-Guang Teng has conducted research over a period of more than three decades on a wide range of topics within the broad field of structural engineering. He has authored/co-authored over 210 SCI journal papers, leading to over 11,000 citations and an H-index of 51 according to the Web of Science Core Collection. Many of his research findings have been adopted by relevant design guidelines/codes in China, the United States, Europe, the United Kingdom and Australia. His current research interests include the use of FRP composites and other high-performance materials to achieve sustainable structures, life-cycle performance of structures, and recycling of construction materials for structural use.

Prof. Teng has received a number of prestigious awards for his research achievements, including the State Natural Science Award of China, the Distinguished Young Scholar Award from the National Natural Science Foundation of China, and the IIFC Medal from the International Institute for FRP in Construction (IIFC). He was elected a Member of the Chinese Academy of Sciences in 2017, a Corresponding Fellow of the Royal Society of Edinburgh in 2015, and a Fellow of the Hong Kong Academy of Engineering Sciences in 2013.

## Research Group for Urban Geo-hazards

Group Leader: Professor Jian-hua YIN

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Email: cejhyin@polyu.edu.hk



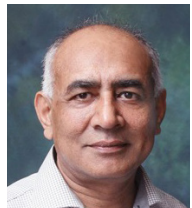
Professor Yin received a BEng degree in 1983 in Chinese Mainland, an MSc degree from the Institute of Rock and Soil Mechanics of the Chinese Academy of Sciences in 1984, and a PhD from The University of Manitoba, Canada in 1990. Dr Yin has a mix of industrial and academic experiences. He joined the Department of Civil and Environmental Engineering at The Hong Kong Polytechnic University in 1995 as an Assistant Professor. He was promoted to an Associate Professor position in 1999, to a Professor position in 2002, and to the position of Chair Professor of Soil Mechanics in 2014. Professor Yin has a good track record in research and has played a leading role in the development of advanced soil testing equipment and innovative fiber optical sensors, establishing a large-scale multi-purpose physical modeling facility for studying geo-hazards and the organization of regional and international conferences. His research interests include (i) testing and studying the properties and behaviour of soils, (ii) elastic visco-plastic modeling, (iii) soft soil improvement, (iv) soil nails and slope analysis, (v) studying the impact of debris flow and rockfall on a flexible barrier, (vi) development of and applications for fiber optical sensors, (vii) soil-structure interface, and (viii) development of advanced/special lab testing apparatus. Professor Yin serves as a Vice-President of International Association for Computer Methods and Advances in Geomechanics (IACMAG), a Co-Editor of International Journal of Geomechanics (ASCE), and a Co-Editor of Geomechanics and Geoengineering (UK). He has received the honours of the prestigious “JOHN BOOKER Medal” in 2008, “Chandra S. Desai Excellence Award” in 2011, and “Outstanding Contributions Medal” in 2017 from all IACMAG. He delivered the high-status 2011 “Huang Wenxi Lecture” in Chinese Mainland.

## Research Group for Urban Fire Safety

Group Leader: Professor Asif Sohail USMANI

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Professor Usmani joined The Hong Kong Polytechnic University in August 2016, having previously been the Head of Civil Engineering at Brunel University London and the Head of the Research Institute for Infrastructure and Environment and Professor of Structural Engineering and Computational Mechanics at the University of Edinburgh (until Sept 2015). After obtaining a first degree in civil engineering, a Master's in structural engineering at Stanford University (USA) in 1983 and four years of structural engineering design and construction in Saudi Arabia, he decided to pursue a research career in 1986. He developed finite element codes for the simulation of foundry casting processes during his PhD at Swansea University for modelling of molten metal flow, heat transfer and solidification. His multidisciplinary background led him to initiate structural fire safety engineering research at the University Edinburgh following his appointment as Lecturer in 1995, which in turn helped the university to establish itself as an internationally leading research centre in this field. His research in fire safety engineering has focused on understanding the thermo-mechanical behaviour of structures in real fires using computational methods validated with experiments. Key achievements have included the provision of fresh insights to understand non-intuitive structural behaviour observed in full-scale fire tests on a steel-frame composite building at Cardington (UK) during the mid-1990s; explaining the collapse of WTC Twin Towers, proposing and leading research on a distributed real-time emergency response system, FireGrid, demonstrated successfully in London in 2010 (subject of a BBC Horizon documentary) and the development of open-source software OpenSees for modelling structures in fire including multi-hazard response simulation.



**Research Group for Multi-Functional Coating Materials  
for Infrastructure and Building Sustainability**

Group Leader: Professor Jian-guo DAI

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Prof. Dai Jian-Guo graduated with his Bachelor degree in civil engineering from Dalian University of Technology and his PhD degree in social infrastructure engineering from Hokkaido University, Japan. After several years of industry experience in Japan, he joined PolyU in June 2008 and was promoted to full professor in July 2018. Prof Dai's main research area is innovative materials and structural systems for sustainable construction, including the use of fiber-reinforced polymer composites, ultra-high performance fiber-reinforced cementitious composites, geopolymers concrete and concrete surface treatment materials for durability and life cycle performance enhancement of concrete infrastructures. He has authored more than 240 papers in academic journals and international conferences. His research has been recognized by a number of awards, including the Best Basic Research Paper Award from ASCE, Journal of Composites for Construction. Prof. Dai is active in international research communities; at present, he is Chair of the Technical Board of Asian Concrete Federation (ACF) and Fellow and Vice President of the International Institution of FRP Composites for Construction (IIFC). He is editor of the SCI journal Advances in Structural Engineering. As the conference chair, he successfully organized the 8th International Conference on Water Repellent Treatment and Protective Surface Technology for Building Materials.

## Research Group for Corporate Environmental Management

Group Leader: Professor Eric W. T. NGAI

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Prof. Eric Ngai is a Professor and Associate Head in the Department of Management and Marketing at The Hong Kong Polytechnic University. He has over 130 refereed international journal publications, including four papers that rank among the Top 10 most-cited articles published in the Journal of Operations Management, International Journal of Production Economics and Decision Support Systems. He has obtained 10 GRF/CERG, ITF and other external competitive grants, acting as a principal investigator in all of them. In the last 5 years, he has successfully proposed 5 externally funded projects, with a total budget in excess of HK\$ 10 million. He serves on the editorial board of four international journals and acts an Associate Editor of Information & Management. Prof. Ngai has attained an h-index of 39, and received 5860 citations in the ISI Web of Science, solidifying himself as an established scholar in the area of management support systems for big data analytics and sustainability development, sustainable supply chain management, energy and environmental informatics and RFID technologies and applications.

## Research Group for Environmental Energy

Group Leader: Professor Meng NI

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Prof. Meng NI studied Aero-engine engineering in China and obtained his PhD in Mechanical Engineering from The University of Hong Kong (HKU) in 2007. He initially worked as a Post-Doctoral Fellow in HKU before joining BRE as an Assistant Professor in July 2009. He was promoted to Associate Professor in July 2012 and Professor in July 2016.

Prof. Ni was dedicated to teaching, and his Student Feedback Questionnaire (SFQ) scores were within the top 10% in the faculty.

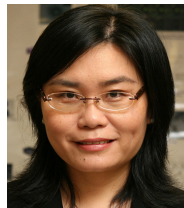
Prof. Ni's research has focused on solid oxide fuel cells (SOFCs) and other electrochemical systems for energy conversion/storage. His research has received funding support from RGC (GRF, ECS, SFC/RGC joint scheme, and France/HK Joint Scheme), ECF, NSFC, and ITF. Prof. NI has published over 130 papers in prestigious scientific journals with over 7000 SCI citations, and his H-index is 33. He serves as an Associate Editor for 3 journals, an Editorial Board Member for 7 journals, and a reviewer for over 60 journals. Prof. Ni has received 26 invitations to deliver keynote/invited lectures at various international conferences, and received the Young Scientist Award from the Hong Kong Institution of Science in 2007. In 2011, he received the "Top Reviewer Award" from Applied Energy. In June 2016, Prof. Ni was listed in the World's Highly Cited Researchers in Energy Science and Technology by Shanghai Ranking, and was also awarded "Best Associate Editor Award" by Science Bulletin in August 2016 and 2017. Prof. Ni is a Humboldt Fellow. He conducted collaborative research at Jülich Forschungszentrum, Germany from January to July 2017.

## Research Group for Nano-materials for the Environment

Group Leader: Professor Pauline Pei Li

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Prof. Pauline Pei Li joined the Department of Applied Biology and Chemical Technology in 1991. She has conducted a wide range of research focusing on key material challenges of synthetic polymer and biopolymer through the design and development of novel synthetic strategies. Potential applications of her research lie in controlled drug release, gene therapy, enzyme immobilization, biomolecular and chemical separations, surface coatings, and wastewater treatment. The core-shell particle platform technology has been licensed to companies for various commercial applications. A pilot plant for scale-up production of nanomaterials has also been set up in China for commercial production. Prof. Li has over 80 publications in internationally refereed journals, individual chapters and books of her own, and holds 17 U.S. patents with 1 more pending. She has been invited to give over 40 keynotes and invited presentations at international conferences and received many awards for her research and technology transfer, such as The President's Award for Research and Scholarly Activities (2008) and the Distinguished Knowledge Transfer Excellence Awards (2012) of the Hong Kong Polytechnic University.

## Research Group for Regional Air Quality

Group Leader: Professor Tao WANG

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Professor Wang obtained a BSc in Chemistry from Nankai University in 1985, a PhD in Atmospheric Chemistry from the Georgia Institute of Technology in 1992, and did postdoctoral research at the University of Michigan, Ann Arbor. He studies air pollution problems in Hong Kong and other mega cities in China. He has led a number of research projects, having served as chief scientist for China's National Basic Research Project on acid rain and as Project Coordinator of a Hong Kong Research Grants Council's Theme-based project on photochemical pollution. He was an Associate Editor for Journal of Geophysical Research: Atmospheres, a leading international geosciences journal, and is a member of the Scientific Steering Committee of the International Global Atmospheric Chemistry Project. He is a guest/adjunct professor at several Chinese mainland universities/research institutions and the University of Gothenburg in Sweden. Prof. Wang has published over 170 papers in international journals.

## Research Group for Sustainable Waste Management

Group Leader: Professor Chi-Sun POON

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Professor Poon obtained his PhD from Imperial College. He is currently Chair Professor of Sustainable Construction Materials and Director of the Research Centre for Environmental Technology and Management at the Civil and Environmental Engineering Department. Prof. Poon specializes in the research and development of environmental-friendly construction materials, waste management and recycling technologies, and sustainable construction. He has published over 400 papers in international journals and conferences. He is a Fellow of the Hong Kong Institution of Engineers (HKIE) and a Past Chairman of the HKIE Environmental Division. He is also a Fellow of the Hong Kong Concrete Institute (HKCI) and the current President of the HKCI.

## Research Group for Urban Ecosystems

Group Leader: Professor Xiang-dong LI

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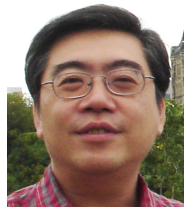
Professor Xiang-dong Li teaches in the Department of Civil and Environmental Engineering at The Hong Kong Polytechnic University. He obtained his BSc in Earth Sciences and his MSc in Geochemistry from Nanjing University, and his PhD in Environmental Technology from Imperial College London. His major research interests include regional environmental pollution, urban environmental studies, and remediation of contaminated soils. Prof. Li has published more than 200 papers, mostly in leading international journals. He is highly cited in the field of Environment/Ecology, with ten of his publications listed within the top 1% of cited papers in the field. His recent research projects have mainly focused on environmental changes in the fast developing Pearl River Delta (PRD) region of South China. Prof. Li's research team has been engaged in the study of trace metals, organic pollutants and ARGs in soils, sediments, biological samples, and atmospheric particles, including their impacts on human health and ecological systems.

**Research Group for Urban Noise Mitigation**

Group Leader: Professor Shiu-keung TANG

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Professor Tang obtained his BSc(Eng) from the Mechanical Engineering Department of The University of Hong Kong in 1987. He finished his PhD in acoustics and fluid dynamics from the same department in 1992. He joined the Department of Building Services Engineering at The Hong Kong Polytechnic University in July 1993. He is currently the leader of the Building Acoustics and Vibration research group in the Department, and is a member of a number of research centres at the University. He is also active in organising acoustics conferences and providing services to the industry. Prof. Tang has published over 109 research papers devoted to the science and applications of fluid mechanics, acoustics and mathematics. He has also completed over 100 consultancy projects. His current research interests are aeroacoustics, building acoustics and ventilation-enabling façade sound insulation devices.

**Research Group for Urban Water and Wastewater Treatment**

Group Leader: Professor Wei CHU

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Professor Chu is the Program Leader of MSc in Environmental Management and Engineering, and the Lab-in-Charge of Water and Waste Laboratory in the Department of Civil and Environmental Engineering at The Hong Kong Polytechnic University. He has more than twenty five years of experience in the water and wastewater treatment technologies with special interests in advanced oxidation processes, catalytic reactions, and treatment plant design. He has been involved in many high-level consultancy projects for the Hong Kong government and private companies. He has published more than 160 SCI journal papers, with most of them published in the most critical Class-A journals, and his work has been cited over 4800 times, according to the Scopus. He has received several awards, including the Keynote Speaker of the Distinguished Alumni at Tunghai University, the Medal Award of Contribution and Outstanding Achievement in Environmental Engineering and Technology of Taichung in Taiwan, the Faculty Award for Excellent Performance/Achievement in research and scholarly activities of HKPolyU (Twice), the Young Scientist Paper Award of American Academy of Science, and the Civil Engineering Award of Purdue University. He is currently a member of the Innovation and Technology Fund Research Project Assessment Panel for Innovation and Technology Fund (ITF), Innovation and Technology Commission, HKSAR, the Advisory Committee on Water Supplies, Development Bureau, HKSAR, and Technical Advisor to the Chartered Institute of Plumbing and Heating Engineering – Hong Kong Branch (CIPHE-HKB).



## Research Group for Energy Conversion Materials

Group Leader: Professor Raymond Wai Yeung WONG

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Professor Raymond Wong received both his B.Sc. degree with First Class Honours and Ph.D. degree from The University of Hong Kong. After his postdoctoral research at Texas A&M University and the University of Cambridge, he joined the Department of Chemistry at Hong Kong Baptist University as an Assistant Professor, rising through the academic ranks to become Chair Professor in Chemistry. He served as the Head of the Department there before he moved to the Hong Kong Polytechnic University in 2016. He is currently Chair Professor of Chemical Technology at the Department of Applied Biology & Chemical Technology and Associate Dean (Research) of the Faculty of Applied Science & Textiles. Professor Wong's research focuses on the design and synthesis of new molecular functional materials and metallopolymer with photofunctional properties and energy functions. Currently, his team aims to develop sustainable energy sources and improve the technologies for energy conversions in order to meet the world's future energy demands while working towards a cleaner environment. The materials developed have wide applications as converters for light/electricity signals in organic solar cells and organic light-emitting diodes. He has earned a number of international and national awards. He became the first Chinese scientist to be presented with the RSC Chemistry of the Transition Metals Award in 2010, and won the Croucher Senior Research Fellowship, the Natural Science Award (First Class) of the Ministry of Education, the FACS Distinguished Young Chemist Award, the Ho Leung Ho Lee Foundation Prize for Scientific and Technological Innovation and the State Natural Science Award (Second Class), among others. He was named on the list of Highly Cited Researchers 2014–2018 published by Thomson Reuters/Clarivate Analytics.

## Research Group for Building Energy and Automation

Group Leader: Professor Shengwei WANG

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Prof. Wang is extensively involved in smart building and building energy research and applications. In the last 20 years, he has obtained over thirty research grants, including 15 GRF grants from the Research Grants Council (RGC) of Hong Kong. He is a recipient of the “Overseas Outstanding Young Talents” research grant of NSFC (2011). He published two books, co-authored four books, and published over 350 papers in refereed journals (including over 210 papers in SCI journals). He is one of the top 150 most highly-cited scholars in “Energy Science and Engineering” (based on Scopus of Elsevier, 2016).

He also received a significant amount of funding from the industry (over HK\$ 19 million in total) for technology development and applications. He has achieved great success in enhancing the energy efficiency of new/existing buildings, including the International Commerce Centre (ICC), hotels, MTR stations, industrial buildings and PolyU campus buildings, with energy savings increasing from 15% to 42%. He has received a number of international and national awards for building energy research and technology development and applications, such as the ASHRAE Technology Award (2014). He is an associate editor of “Science and Technology for the Built Environment”. He holds guest/adjunct professorships in ten leading universities in both the US and Mainland China.

## Research Group for Building Thermal Environment and Urban Climate

Group Leader: Professor Jian-lei NIU

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Professor Niu received his BEng and MSc degrees from Tsinghua University and PhD from the Delft University of Technology. He also had brief R&D training from the industry in UK. Since joining PolyU, he has secured 14 RGC CERG/GRF grants, along with two ITF grants, two RFCID/HMRF grants and one RGC/NSFC joint grant. His technology contributions are in a broad area, linking thermal and fluid sciences with building environment. He is an editor-in- chief of the Elsevier journal Energy and Buildings, and sits in the editorial board of the Elsevier journal Building and Environment and Journal of Building Performance Simulation, IBPSA's official journal published by Taylor & Francis Journal. He was awarded the fellowship by five leading professional and academic societies, including CIBSE (Chartered Institution of Building Services Engineers), UK, ASHRAE (American Society of Heating, Refrigerating and Air-conditioning Engineers), ISIAQ (International Society of Indoor Air Quality) Academy of Fellows, and IBPSA(International Building Performance Simulation Association).

## Research Group for Environmental and Energy Economics

Group Leader: Dr David BROADSTOCK

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David is an Assistant Professor of Economics in the School of Accounting and Finance at The Hong Kong Polytechnic University, where he also serves as Deputy Director [Economic Sustainability] in the department's Center for Economic Sustainability and Entrepreneurial Research. David's research interests cover various aspects of the empirical economics of energy and the environment, with a particular emphasis on consumer behavior. He currently serves as an editor for The Energy Journal, and also holds a position on the editorial board for the British Journal of Management. David has published work in high-ranked international journals spanning the fields of energy economics, transportation economics and financial economics, including The Energy Journal, Energy Economics, Energy Policy, The Journal of Cleaner Production, The International Journal of Sustainable Transportation, Transport Research Part A, the Journal of International Financial Markets, Institutions and Money and The British Accounting Review. Prior to becoming a lecturer, David worked as a consultant in industry, providing advice on a wide range of economics and business solutions on projects across the world, and has also contributed to important large-scale research projects, including the UK Energy Research Centre project on the rebound effect, the Research project on Lifestyles Values and the Environment (RESOLVE) and most recently, an EU/Greek Ministry of Education project on efficiency analysis (THALES).

## Research Group for Indoor Air Quality

Group Leader: Professor Shun-cheng LEE

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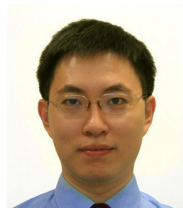
Professor Lee, Professor of the Department of Civil and Environmental Engineering at The Hong Kong Polytechnic University since 2005, earned a Doctorate in Environmental Sciences at the University of California, Berkeley in 1994. He was appointed Assistant Professor after graduation and has been working on indoor and outdoor air pollution studies, namely toxic air pollution modelling, emission source characterisation and carbonaceous aerosol characterisation. Apart from air pollution studies, he is devoted to risk assessment research with respect to public health, such as exposure to volatile organic compounds in indoor environments. He was Chairman of the Air and Waste Management Association in Hong Kong from 1997 to 1999. He obtained a Dean's Award for Outstanding Achievement in Research Funding in 2008 and a Best Paper Award on Indoor Air Quality Research organised by the Chinese Society of Particology. In 2016, he became one of 4 winners (Aerosol Field) in the Special Contribution Award of the 30th anniversary of Chinese Society of Particology. He has recently undertaken a National Key Research and Development Program of China on the innovation and application of nanomaterial technology to remove major indoor air pollutants, supported by the Ministry of Science and Technology. All of his achievements are recognitions of his academic standing in the field.

## Research Group for LED Based Energy Efficient Communication Systems

Group Leader: Dr Chang-yuan YU

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Dr. Changyuan YU received his Ph.D. in Electrical Engineering from the University of Southern California, USA in 2005. He was a visiting researcher at NEC Labs America in Princeton, USA in 2005. He then joined the faculty of National University of Singapore (NUS) in December 2005, where he served as the founding leader of the Photonic System Research Group in the Department of Electrical and Computer Engineering. He was also a joint senior scientist with the Institute for Infocomm Research (I2R), Agency for Science, Technology and Research (A\*STAR) in Singapore. In December 2015, he joined the Hong Kong Polytechnic University as an associate professor in Department of Electronic and Information Engineering, and continues to be an adjunct associate professor of NUS. His research focuses on photonic devices, subsystems, optical fiber communication and sensor systems, and biomedical instruments. As the PI/co-PI, he secured over US\$4 million in research grants, and supervised 10 postdocs and 20 PhD students. He has authored/co-authored 1 US patent, 6 book chapters and 388 journal and conference papers, 75 of which he has been invited to, including OFC2012 in the USA. His group won 6 best paper awards in conferences and the championship in biomedical area in the 3rd China Innovation and Entrepreneurship Competition in 2014.

## Research Group for Renewable Energy

Group Leader: Professor Hong-xing YANG

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Prof. Yang received his BEng in 1982 and MEng in 1985 in the Division of HVACR Engineering of Tianjin University, China. He obtained his PhD in 1993 in the Mechanical Engineering Department, University of Wales College of Cardiff, UK. He is now leading the Renewable Energy Research Group (RERG) in the Department of Building Services Engineering at The Hong Kong Polytechnic University. His research interests cover a number of R&D topics in renewable energy applications and energy saving in buildings in urban areas, including solar photovoltaic integration in buildings, indirect evaporation cooling, ground-coupled heat pumps and solar cell related materials. He has completed a number of research projects in recent years. He has over 300 academic papers and 5 professional books published. According to ShanghaiRanking's Global Ranking of Academic Subjects 2016 conducted by the Center for World-Class Universities of Shanghai Jiao Tong University and Elsevier, he is on the list of 150 world most-cited researchers, with impactful research in the disciplines of Civil Engineering. He was also on the list of the "Highly Cited Researchers 2017" reported by Clarivate Analytics. He serves as associate editor for the International Journal of Applied Energy, section editor for the International Journal of Low Carbon Technologies, and holds a position on the editorial boards of several other international journals. He was elected founding president of the Solar Energy Society of Hong Kong in 2018. He is also the coordinator of the Green Building Division of the Research Institute for Sustainable Urban Development at the Hong Kong Polytechnic University.

## **Research Group for Geo-spatial Technology in Urban Development**

Group Leader: Professor John W. Z. SHI

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Prof Shi is Chair Professor in GISci and remote sensing, Head of Department of Land Surveying and Geo-Informatics, Director of Laboratory for Smart City and Spatial Big Data Analytics at the Hong Kong Polytechnic University. He obtained his doctoral degree from the University of Osnabrück in Vechta, Germany in 1994.

Prof Shi's current research interests are in the areas of GISci, remote sensing and urban informatics. His work focuses on the following topics: analytics and quality control for spatial big data, object extraction and change detection from satellite images and LiDAR data, integrated indoor mapping technology, 3D and dynamic GISci modelling, and Smart City applications.

Before taking up his current post, Prof Shi previously served as President of Commission II for the International Society for Photogrammetry and Remote Sensing from 2008-2012, and was President of the Hong Kong Geographic Information System Association from 2001-2003. He also serves as an editorial board member for a number of international journals. He has published more than 250 journal articles (with 160 SCI papers) and 15 books. He has received a number of prestigious awards, including an award from the International Society of Photogrammetry and Remote Sensing and Natural Science Award from the State Council, China.

## **Research Group for Management of Underground Utilities**

Group Leader: Professor Wu CHEN

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Professor Chen joined The Hong Kong Polytechnic University in 2000 and is currently a Professor in the Department of Land Surveying and Geo-Informatics at The Hong Kong Polytechnic University. He was awarded a BSc by the Chinese University of Science and Technology in 1982, a MSc by the Institute of Geodesy and Geophysics at the Chinese Academy of Science in 1985, and a PhD from the University of Newcastle upon Tyne in 1992. From 1985 to 1988, he worked at the Institute of Geodesy and Geophysics as a research associate, specialising in GPS-related research. From 1992 to 2000, he worked on various research projects related to GNSS at the Institute of Engineering Surveying and Space Geodesy of the University of Nottingham.

## Research Group for Internet Service Monitoring and Diagnostics

Group Leader: Dr. Rocky K. C. CHANG

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Rocky is currently serving as an Associate Professor in the Department of Computing of the Hong Kong Polytechnic University. Prior to returning to Hong Kong, he received his post-doctoral training at the Computer Science Department of the IBM Thomas J. Watson Research Center. He received his PhD and MSc from the Rensselaer Polytechnic Institute and undergraduate education from Virginia Tech and Vincennes University. Rocky has been leading an Internet Infrastructure and Security Research Group for the last twenty years, addressing network measurement, network security, and network operations and management problems. The Group has published their findings in top conferences and journals, such as JSAC, MM, CoNEXT, INFOCOM, ATC, IMC, NDSS, and IEEE Trans Dependable Secure Comput. His recent research activities are generously supported by the Innovation Technology Fund, Areas of Excellence Scheme in Information Technology, the Research Grant Council of Hong Kong, Huawei, and Cisco Inc. He also provides consultancy services to the Joint Universities Computer Centre, ITS of PolyU, and a Hong Kong government department. Rocky has received the Most Active New Consultant Award (Merit) in 2014, the Faculty's Industrial and Engineering Services Grant Achievement Awards in 2012 and 2009, and the First Runner-Up in the Faculty of Engineering's Best Teacher Award in 2001. He was a KTP Visiting Fellow at the University of Technology, Sydney in October 2016 and a Co-Chair of ACM CoNEXT'16 Student Workshop.

## Research Group for Unmanned Airborne System for Urban Monitoring

Group Leader: Professor Chih-Yung WEN

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Professor Wen received his BSc degree from the Department of Mechanical Engineering at the National Taiwan University in 1986 and his MSc and PhD from the Department of Aeronautics at the California Institute of Technology (Caltech), U.S.A. in 1989 and 1994 respectively. Professor Wen has solid experience and track records in both research and administration. He was the Chairman of the Department of Mechanical and Vehicle Engineering from August 1997 to July 2000, and Provost of the Da-Yeh University in Taiwan from August 2004 to July 2006. He started his teaching and research works at the Department of Mechanical Engineering at the Da-Yeh University, Taiwan and was promoted to full professorship in February 2002. In August 2006, Professor Wen joined the Department of Aeronautics and Astronautics at the National Cheng Kung University (NCKU) in Taiwan. In September 2012, he joined the Department of Mechanical Engineering at The Hong Kong Polytechnic University, and currently serves as the associate head of the department. He has authored and co-authored many scientific papers, conference papers and book chapters. He was also awarded 14 patents. His current research interests are in the areas of (1) UAVs and MAVs, (2) Hypersonic aerothermodynamics and detonation, (3) Urban wind field/air pollution CFD simulation, and (4) Flow control. Professor Wen is currently an AIAA Associate Fellow, serves as the associate editor of AIAA Journal and Shock wave Journal, and is a member of various key professional boards and bodies related to Aerospace Engineering.

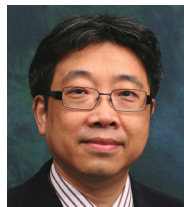


## Research Group for Urban Big Data Computing and Wireless Networking

Group Leader: Professor Jiannong CAO

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Dr. Cao is currently a Chair Professor of the Department of Computing at The Hong Kong Polytechnic University. He is also the director of the Internet and Mobile Computing Lab in the department and the director of the University's Research Facility in Big Data Analytics.

Dr. Cao's research interests include parallel and distributed computing, wireless sensing and networks, pervasive and mobile computing, and big data and cloud computing. He has directed many research and development projects and, as a principal investigator, obtained over HK\$60 million in grants from various funding agencies. He has co-authored 5 books, co-edited 9 books, and published over 500 papers in major international journals and conference proceedings. He has received Best Paper Awards from several conferences, including DSAA'2017, IEEE SMARTCOMP 2016, ISPA 2013, and IEEE WCNC 2011, among others.

Dr. Cao is a member of the IEEE Fellows Evaluation Committee of the Computer Society and the Reliability Society, the IEEE Computer Society Education Awards Selection Committee, the IEEE Communications Society Awards Committee, the Steering Committee of IEEE Transactions on Mobile Computing and previously served as Chair of the Technical Committee on Distributed Computing of IEEE Computer Society from 2012-2014. Dr. Cao has served as chairs and members of the organizing and technical committees of many international conferences, and as associate editor and member of the editorial boards of many international journals, including IEEE TPDS, IEEE TCC, IEEE TC, IEEE Network, ACM TOSN, Elsevier Pervasive and Mobile Computing Journal (PMJ), and Springer Peer-to-Peer Networking and Applications.

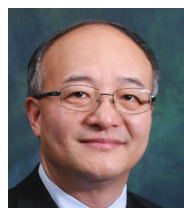
Dr. Cao is a fellow of IEEE and a distinguished member of ACM. In 2017, he received the Overseas Outstanding Contribution Award from the China Computer Federation.

## Research Group for Urban Navigation and Mobility

Group Leader: Professor Xiao-li DING

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Professor Ding is a Chair Professor in the Department of Land Surveying and Geo-Informatics and Associate Dean of Faculty of Construction and Environment at The Hong Kong Polytechnic University. His main research interests include developing technologies for precise positioning, navigation, and hazards studies. His work includes the development of global navigation satellite systems (GNSS), radar remote sensing (especially interferometric synthetic aperture radar), and sensing technologies for the following topics: ground deformation and structural health monitoring, landslides, earthquakes, underground utility, sea level change and glacier studies. Prof. Ding has published extensively in these areas, and has received various research awards for his work.



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