

Propel World-class Research Excellence for a Better World



Research Collaboration Highlights

Three World-Class Research Centres at the Hong Kong Science Park under InnoHK Clusters

PolyU has joined forces with world-leading institutions to establish three world-class research centres at the Hong Kong Science Park under the government-funded InnoHK initiative, which aims to develop Hong Kong as a hub for global research collaboration.

Laboratory for Artificial Intelligence in Design (AiDLab)

In collaboration with the Royal College of Art, UK, PolyU established the AiDLab to integrate innovative Artificial Intelligence (AI) technologies into design to address society's needs for creativity, efficiency and customisation of products and services. AiDLab, located at the Hong Kong Science Park, is the region's first research platform that focuses on AI and design innovations. AiDLab brings together leading researchers from its founding institutions to conduct cross-disciplinary research that creates a positive impact on the global design industry, contributes to the wider economy, and improves the quality of life. Three research programmes at AiDLab include Ergonomic and Inclusive Design, Innovation in Product and Service Design, and Intelligent Fashion Design and Quality Control.

Website: www.aidlab.hk



Centre for Advances in Reliability and Safety (CAiRS)



Collaborated with the University of Maryland, College Park, USA, CAiRS' mission is to develop new approaches using AI methodologies for customised management, and to ensure the reliability and safety of products and systems used in robotics, medical devices, vehicles, telecommunication, consumer products, public utilities, transportation, microelectronics, power devices, sensors and IoT products as well as a broad range of Advanced Manufacturing applications. These multidisciplinary researches using AI approach will contribute significantly in Smart City development. Five research programmes at CAiRS are Anomaly Detection and Syndromic Surveillance, Innovative Diagnostics for Product Health Management, Prognostics for Remaining Useful

Life Assessment, Safety Assurance to improve Functional Safety, and Data Analytics Platform for Reliability.

Website: www.cairs.hk

Centre for Eye and Vision Research (CEVR)

CEVR has been set up as a joint partnership between PolyU and the University of Waterloo, Canada. CEVR promotes eye health with clinical, basic and applied research, and develops ground-breaking technologies to prevent vision loss and preserve sight among the ageing population. CEVR runs five research programmes, namely Myopia and Eye Growth, Ocular Drug Discovery and Delivery, Vision Enhancement, Tear Film and Ocular Surface, and Advanced Optometric Technology.

Website: www.cevr.hk



These three centres have commenced operation, and have been devoted in conducting research projects and working to drive knowledge sharing among the industries, academia and public sectors.

In addition, PolyU has also become the first local collaborating institution of the "Centre for Artificial Intelligence and Robotics, Hong Kong Institute of Science & Innovation, Chinese Academy of Sciences" established by the Institute of Automation of the Chinese Academy of Sciences under InnoHK Clusters.

Combatting COVID 19 Pandemic with Innovation and Technology

Developing Advanced Diagnostic Technology



To combat COVID pandemic with innovation and technology, PolyU developed the world's most comprehensive rapid, automated multiplex diagnostic system for detecting up to 40 infectious respiratory pathogens (including novel coronavirus) in a single test. Furthermore, the university collaborated with Macau University of Science and Technology to advance diagnosis of COVID-19 pneumonia and the development of recombinant RBD Vaccine against SARS-CoV-2.

Designing Effective PPE to Safeguard Public Health

To provide effective protective personal equipment to frontline medical staff and the mass public, PolyU partnered with the Hospital Authority to design and produce a new 3D-printed face shields. Moreover, the university also joined hands with Avalon Nanofibre Limited to transfer nanofiber technology to develop highly protective facemasks for railroad operators.



Advancing Food Safety and Quality

Food Safety Consortium organized the 5th Asia-Pacific Food Safety International Conference (APFSIC)



APFSIC featured over an impeccable network of over 80 speakers and 400 registrants from the industry, academia, research institutes, government, supranational bodies, as well as students globally for a two full-day holistic, inspirational and educational knowledge, best practices, and regional plus global updates in food safety and quality. APFSIC is the 5th regional event of International Association for Food Protection (IAFP), which was founded in 1911 in the United States and represents over 4,000 food safety professionals ranging from educators, government officials, food industry executives and other stakeholders.

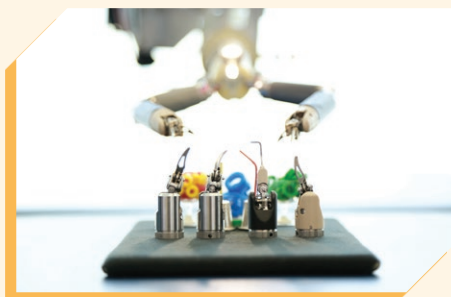
Food Safety Consortium (FSC) becomes the first and only NGO Codex Observer in Hong Kong and Mainland China

FSC is delighted to have become an Observer at the Codex Alimentarius Commission (Codex), a body established by the Food and Agriculture Organisation of the United Nations (FAO) and World Health Organisation (WHO) to develop food standards under the Joint FAO/WHO Food Standards Programme. The Codex Observer status creates a unique opportunity and a significant step forward for FSC to participate in this pre-eminent international food standards-setting body that protects the health of consumers and ensures fair practices in food trade through contributing to international standards, guidelines and codes of practice.



New Research Facilities and Units to Enhance Interdisciplinary Collaboration

The University established the PolyU Academy for Interdisciplinary Research (PAIR) on 7 September 2020 which serves as a central research platform to promote, lead and support interdisciplinary research institutes and other University-level research units of a similar nature. In addition to the existing three Research Institutes in the areas of sustainable urban development, smart cities and smart energy, the University has set up seven Research Institutes to facilitate interdisciplinary collaboration for impactful research within PolyU to address key societal challenges in May 2021. To recognise the University's research achievements in the realm of deep space exploration, the University has also set up a Research Centre for Deep Space Explorations.



Research Institute for Advanced Manufacturing (RIAM)

RIAM aspires to create a world class hub for global research and knowledge transfer in advanced manufacturing to drive the economic growth of Hong Kong, the Greater Bay Area and the Nation.



Research Institute for Future Food (RiFood)

RiFood aspires to be a world-leading RI that advances and transfers knowledge by research, public education and professional service to address the key challenges in Food Science and Human Health, for the benefit of mankind.



Research Institute for Artificial Intelligence of Things (RIAIoT)

RIAIoT aspires to be a world-leading institute in the next generation smart IoT empowered by AI, enabling smart connected societies with ground-breaking innovation, and contributing to the sustainable urban development with energy-saving, operational efficiency, and improved quality of life.



Research Institute for Intelligent Wearable Systems (RI-IWEAR)

RI-IWEAR aspires to be a leading research institute in intelligent wearable systems (IWEAR) via impactful inter-disciplinary research, global academic and industrial collaboration, knowledge and technology transfer, and human resource enhancement.

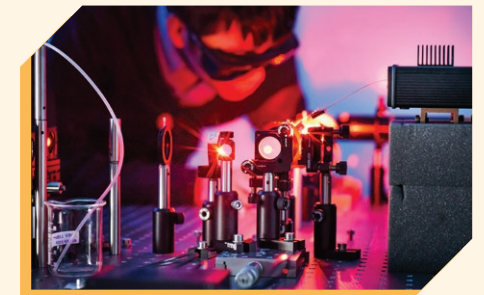
POLYU ACADEMY FOR INTERDISCIPLINARY RESEARCH

Harnessing the strengths of PolyU's research capability and world-class scholars, we have established the PolyU Academy for Interdisciplinary Research (PAIR), a hub for research and innovation operating across disciplines, which aims to develop innovations and cultivate impactful solutions for the good of society.



Research Institute for Land and Space (RILS)

RILS aspires to be a world leader in developing innovative solutions for creating affordable and environmentally friendly land and space.



Photonics Research Institute (PRI)

PRI aspires to be a leading institute worldwide in advancing fundamental knowledge and applications of Photonics in various Science and Engineering disciplines for the benefit of Hong Kong, the Nation and the World.



Research Institute for Smart Ageing (RISA)

RISA aspires to be a leading research institute that advances and transfers knowledge on smart ageing, for the benefit of Hong Kong, the Nation and the world.



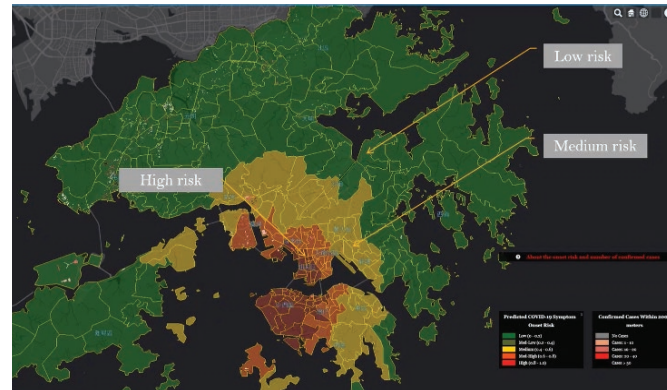
University Research Centre for Deep Space Explorations (UDSE)

Being the only tertiary institution in Hong Kong that possesses international deep space qualification experience, PolyU has been collaborating with China Academy of Space Technology (CAST) in the development of sophisticated space instrument such as Surface Sampling and Packing System for Chang'e 5 Return Mission and Mars Landing Surveillance Camera in the first China Mars Landing Mission in 2020.

A Comprehensive Spatial Analysis and Onset Risk Prediction Platform for COVID-19 Pandemic in Hong Kong



In response to the COVID-19 pandemic and the risks imposed on everyday activities in Hong Kong, PolyU established a city-level epidemic data dashboard and risk prediction system for the public to track the community spread of the epidemic. The COVID-19 risk prediction algorithm is developed by analyzing Hong Kong's urban structure, transportation network,



population environment and other socio-economic data through the use of spatial big data technologies and analysis. This provides an accurate prediction of the development trend of the epidemic in a timelier manner and support the public health department to formulate more precise prevention and control strategies.

Innovation Features

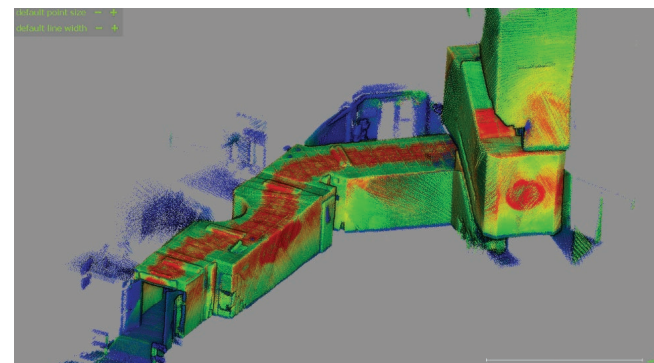
- Three-dimensional visualization of epidemic statistics
- High-precision onset risk prediction at a territorial level
- Pilot high risk area and crowd identification

3D Mobile Mapping System: Providing accurate 3D maps to support Modular Integrated Construction and Smart City Applications

Most of these old buildings do not have 3D indoor Building Information Models (BIM), which creates many challenges when it comes to reconstruction or maintenance. In view of this, PolyU has developed a lightweight and reliable 3D mobile mapping system, which can easily measure cities and obtain 3D maps with centimeter-level accuracy. It can be used to build spatial data infrastructure and can thus support smart city applications in many fields. The system adopts advanced technologies such as Simultaneous Localisation and Mapping (SLAM), which is not restricted by the signal receiving area of the Global Navigation Satellite System (GNSS). It can carry out continuous data collection in different complex indoor and outdoor environments and is particularly suitable for high-density and complex urban environments, such as those in Hong Kong.

Innovation Features

- Measures cities and obtain 3D maps with centimeter-level accuracy
- Adopts advanced technologies such as Simultaneous Localisation and Mapping (SLAM)
- Lightweight, reliable and capable of continuous data collection in complex environments



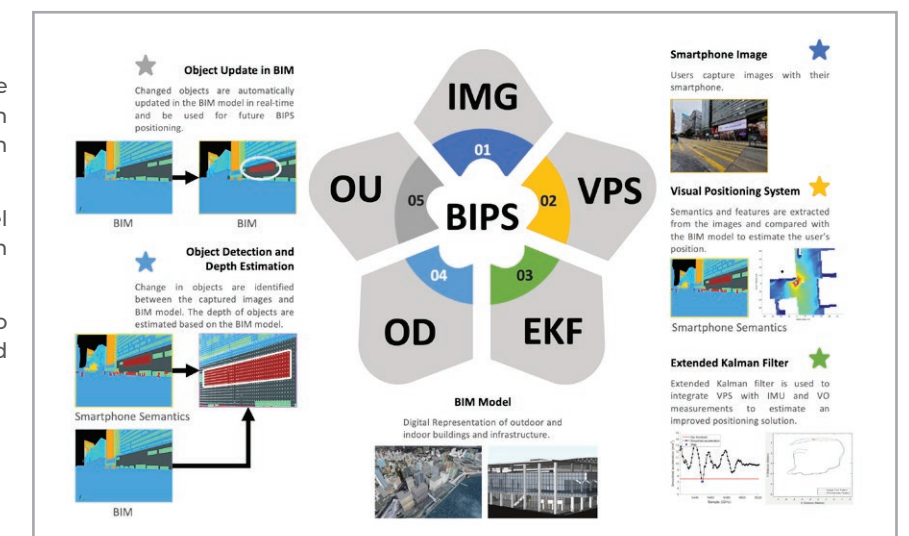
In support of the Hong Kong's Smart City Blueprint, PolyU has been continuously working with the government and community partners to implement smart projects to promote sustainable development in Hong Kong. Many of these projects spearheaded by PolyU and its research institutes have won various international accolades and cover a wide range of smart city applications in the area of Smart City Spatial Data Infrastructure, Digital Transformation and Community Engagement, and much more.

Visual Positioning System based on Building Information Modeling

This high-precision environment perception technology integrates with other existing sensors and utilizes images from smart device cameras to position the user by comparing to the Building Information Modeling (BIM). It can achieve 1m level positioning in both the indoor and urban environments. The objects identified in the images are then used to update the BIM in real-time, providing a self-improving positioning system. In addition to BIM updating, monitoring and maintenance, this innovation can be potentially used in pedestrian navigation as well as mobile robots and drones.

Innovation Features

- The first technology to use semantics and feature information from the environment to position the user
- Achieved highly robust meter-level positioning in indoor and urban environments
- A software approach with no additional infrastructure and hardware cost



3D LiDAR Aided GNSS Precise Positioning for L4 Autonomous Driving



This 3D LiDAR-Aided GNSS Precise Positioning technology tightly couple the environmental perception capability with high-precision satellite positioning technology that is equipped with an intelligent self-adjusting satellite ranging measurement modeling and correction. This allows highly robust centimeter-level high-precision global positioning in urban environments to be achieved for L4 autonomous driving, mobile robots and drones.

Innovation Features

- The first technology to tightly-couple the environmental perception technology with high-precision satellite positioning
- Achieve robust centimeter-level global positioning in urban environments
- A software approach with no additional hardware cost



Smart Monitoring System for Urban Tree Management



Tree risk assessments in areas with high pedestrian and traffic flow needs to be conducted and implement appropriate risk mitigation measures so as to safeguard the public from falling trees, especially during increasing extreme weather events. To address this issue, PolyU collaborated with the Hong Kong Development Bureau with the support of The Hong Kong Jockey Club Charities Trust to develop a smart tree monitoring system to track tree stability on a territorial-wide scale. Their team assessed the risk of tree failure by monitoring trees' swaying or tilting condition by applying spatial big data analytics with AI on the GIS-based platform. The whole pilot scheme involves the installation of about 8,000 sensors on selected urban trees across Hong Kong territorial-wide. Going forward, with the successful implementation



of the pilot scheme, the smart tree management system will be migrated to the government in order to better benefit the city's urban green management as a whole.

Innovation Features

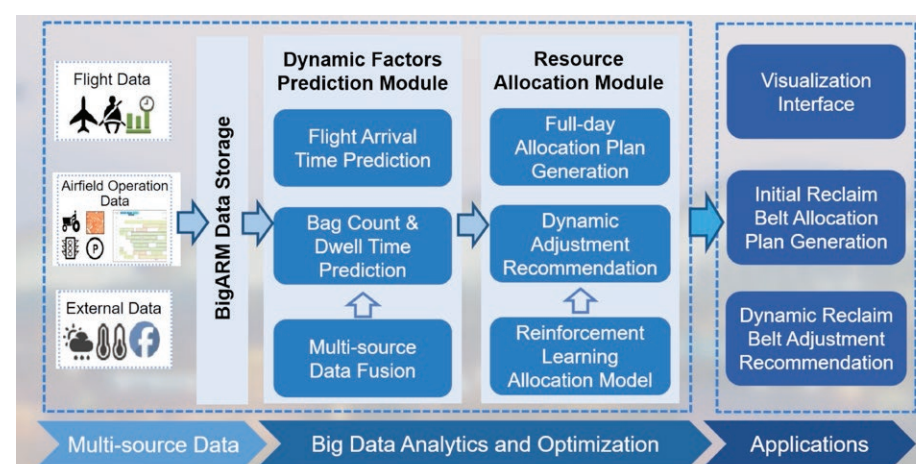
- First-of-its-kind smart sensor system applying to urban forestry management
- Artificial intelligence and spatial big data analytics to predict the leaning trend for trees
- Low latency and long operating battery lifetime

'BigARM' - Big Data Engine for Smart Airport Resource Optimization and Management

In support of the Hong Kong International Airport, PolyU developed a 'BigARM' engine equipped with powerful big data analytics and AI techniques to achieve efficient and intelligent airport resource management. It consists of an airport big data collection and storage module, a data-driven dynamics prediction module, as well as an intelligent resource allocation module for supporting various applications. Notably, BigARM has achieved significant improvement in the accuracy of flight arrival time prediction and arrival bag count prediction. Moreover, it has also helped to reduce the time of full-day allocation planning from several hours to a few seconds, which dramatically reduces the operator workload and increases the efficiency of airport resource management.

Innovation Features

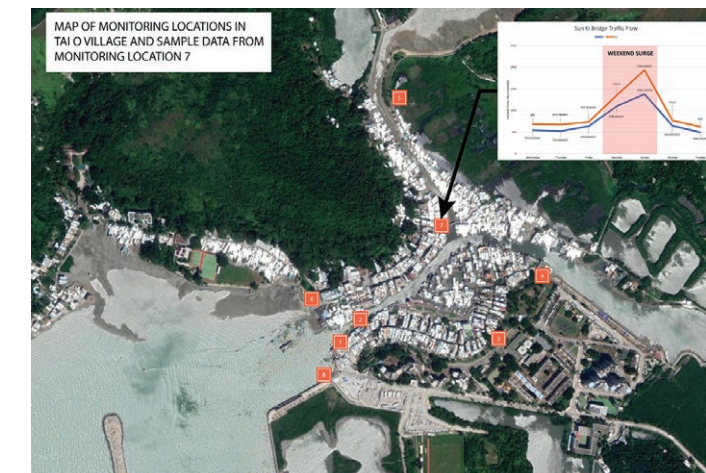
- Powerful big data analytics and AI to achieve efficient and intelligent airport resource
- Accuracy of flight arrival time prediction and arrival bag count prediction
- Reduce the time of full-day allocation planning and operator workload



The Tai O Village Pedestrian Traffic Monitoring Project



The project is a collaborative initiative to collect pedestrian traffic flow data in Tai O Village, Hong Kong. Tai O Village



was recently included in the Sustainable Lantau Blueprint of Hong Kong, a strategy document that designates Tai O as an ecological and cultural tourism center. Anticipating increased tourism visitor traffic and noting substantial current surges in tourist traffic, PolyU partnered with the Tai O Village Rural Committee and various community groups to monitor pedestrian traffic into the Village. This is achieved by developing accessible and open-source technology to set up infrared passage gates installed in eight major infrastructure connections. The project is distinct in that it follows a collaborative model using inexpensive technology developed from consumer products to roll out data collection quickly and with high accessibility for village stakeholder engagement and feedback.

Innovation Features

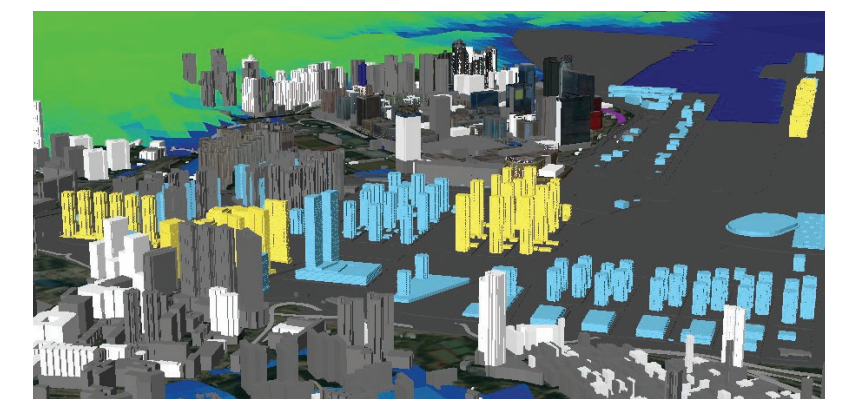
- Adopts a collaborative model to engage community stakeholders through real-time pedestrian traffic monitoring
- Highly accessible and open-source technology with low material and time cost

Evidence-based Community Engagement for Kai Tak supported by Spatial Analysis Technologies

Hong Kong is an international metropolitan city with a severe shortage of land supply for housing development. Although minor relaxation of plot ratio and/or building height restrictions presents a possible path to provide housing opportunities, its impact on the surroundings must be carefully analysed. For the Kai Tak development area, PolyU provided vivid 3D what-if analyses of different scenarios on the surrounding environment for effective community engagement. This is achieved through the use of 3D modelling, 3D spatial analysis, and CFD simulation to analyse the impact of minor relaxations on urban skylines, mountain ridgelines, shadow and lighting, air temperature, and wind ventilation. This evidence-based approach has been used to engage various stakeholders and significantly improved the efficiency and effectiveness of community engagement.

Innovation Features

- Adopts evidence-based approach to enhancing community engagement
- Applies a range of spatial analysis technologies - 3D modelling, 3D spatial analysis, and CFD simulation
- Vivid 3D what-if analyses of different scenarios for public engagement

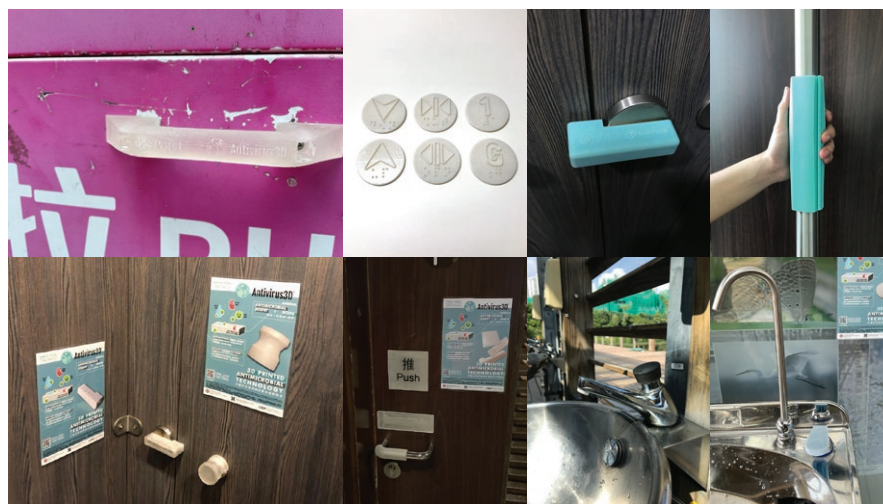


Antivirus3D

Antivirus3D™ is a novel antimicrobial 3D printing technology that enables new medical usage of 3D printing products to combat against contact transmission of lethal microbial in public areas. As the antimicrobial agents fill from the core to the surface of the 3D printed object, it provides longer-lasting antimicrobial effects compared to simple coatings. It can therefore be applied on objects that are subject to wear and tear, such as door handles in toilet cubicles and lift panels. With potential applications in various public facilities, healthcare and medical settings, it provides greater protection to the public while greatly reduces the staffing needed to keep public areas clean.

Innovation Features

- Longer-lasting anti-microbial effects while safe for human use
- Highly customizable - can be applied to 3D printing with different hardness levels, color and transparency
- Economical solution for printing small quantities of antimicrobial parts

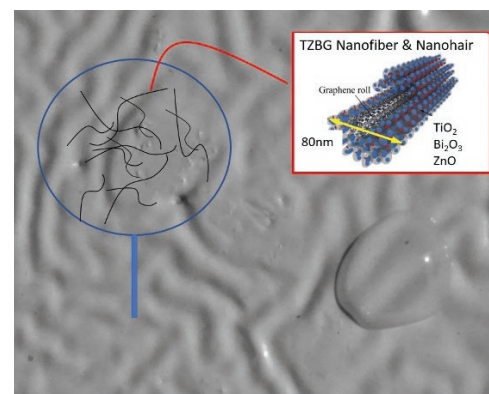


Whitewash

Whitewash is a photocatalyst made of Titania composite that absorbs visible light, even under diffuse light condition, and generates necessary radicals that oxidize harmful gas molecules, viruses and bacteria. This photocatalyst are made into nanofibers with diameter less than 1/1000 times that of human hair. When combined with oxygen and water vapor in air, special ions and radicals are produced to oxidize the undesired gases adsorbed on the photocatalyst. As such, this innovation can be applied in air purification and disinfection services in various public facilities and healthcare settings, such as elevators, vehicle cabins, hospital wards, commercial kitchens to safeguard public health.

Innovation Features

- Air purification - break down harmful indoor volatile organic compounds to harmless substances
- Many folds better than the best TiO2 nanoparticle alternatives
- Can be reused many times and do not require replenishment
- No harmful ions released unlike conventional purifiers

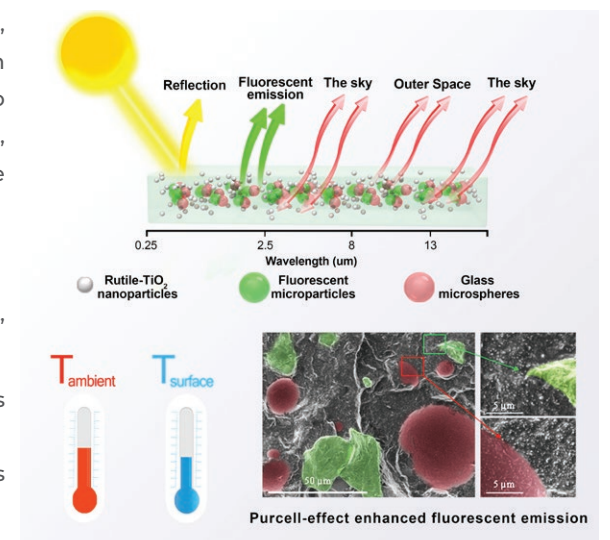


An Eco-Friendly Smart Coating to Keep Buildings Cool without Air Conditioners

Sub-ambient daytime radiative cooling (SDRC) provides a promising electricity- and cryogen-free pathway for global energy-efficiency, however such systems require stringent surface designs which are neither cost-effective nor eco-friendly. In response to this challenge, PolyU developed a method to upgrade the conventional building-coating materials with a peculiar self-adaptive cooling effect through combining particle scattering, sunlight-excited fluorescence, and mid-infrared broadband radiation. When exposed to direct sunlight, this innovative coating can achieve 6 °C below the ambient temperature under a solar intensity of 850 W/m², yielding a cooling power of 84 W/m². This cost-effective approach opens up a totally new avenue in broadening the technology into various applications in buildings, infrastructures, automobiles, pavements, communication stations as well as functional textile materials for personal cooling.

Innovation Features

- Eco-friendly smart coating material which adopts a “smart” cooling mechanism
- Significantly enhances daytime cooling and minimizes nighttime heat loss
- Offers a cost-effective approach for wide industrial applications

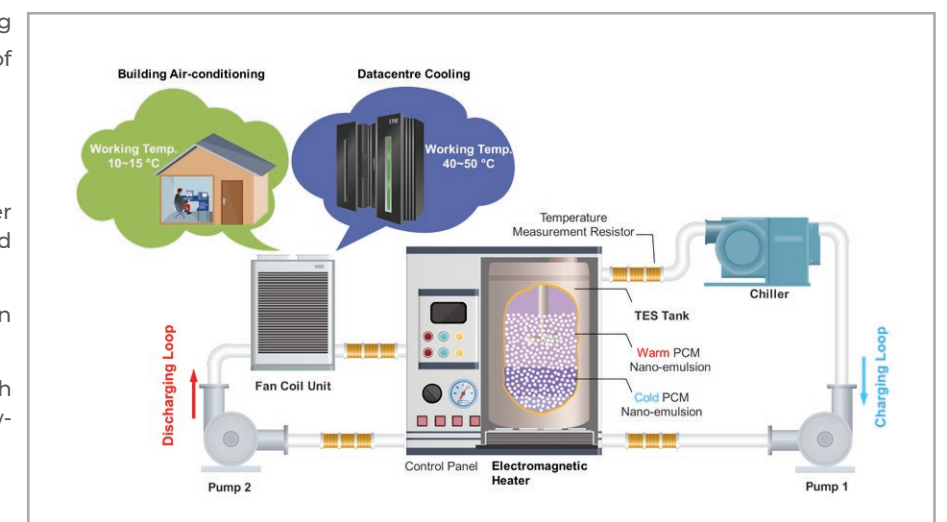


High-performance PCM nano-emulsions for Efficient Thermal Energy Storage

Thermal energy storage (TES) technology is developed to save and reserve the excess thermal energy from various sources for better utilization. Phase change materials (PCMs) are the media for storage of latent heat. The PCM nano-emulsion developed by PolyU is a homogeneous dispersion of nano-sized PCM droplets that can attain a more efficient heat transfer between the PCM droplets and the ambient fluid. Furthermore, it can be regenerated and reused for many heating-cooling cycles, retaining a long service life. As a homogenous and low-viscosity fluid, it can be readily transported through the TES system. With all these features, this innovation can be potentially applied in air-conditioning in active building systems, solar water heating and thermal management of batteries and electronics.

Innovation Features

- Achieves efficient heat transfer between the PCM droplets and the ambient fluid
- Capable of regeneration allowing for a long service life
- Readily transported through the TES system due to its low-viscosity



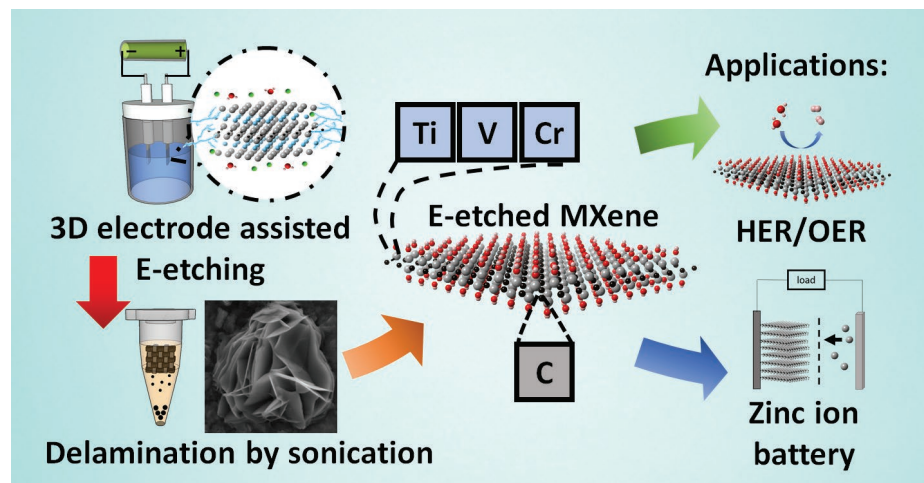
HF-free facile and rapid synthesis of MXenes related materials and their Efficient Energy Conversion and Storage Applications



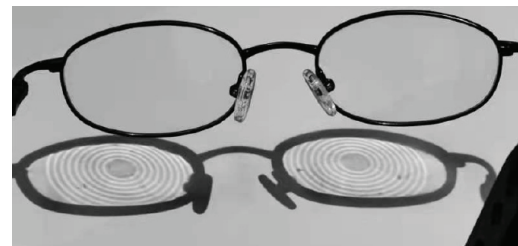
MXene possess widespread applications in electrochemical energy storage and bio-imaging due to its high robustness and non-toxicity. However, traditional toxic synthetic routes require the use of highly toxic hydrofluoric (HF) acid to synthesize MXenes which raises considerable safety and environmental concerns. To overcome this problem, a HF-free electrochemical method is developed to synthesize MXenes. The resulting MXenes exhibits stable and highly efficient energy storage, offering promising applications towards fast-approaching raised energy crisis and demands.

Innovation Features

- Exhibits stable and highly efficient energy storage
- Achieves high degree of flexibility by coupling with flexible substances for portable and bendable equipment
- Adopts a safe and environmentally friendly approach to synthesize MXenes
- Possesses high etching efficiency and short preparation time



Novel Optic Design and Precision Manufacturing of a Nanostructured Defocus-Incorporated Spectacle Lens for Human Myopia Control



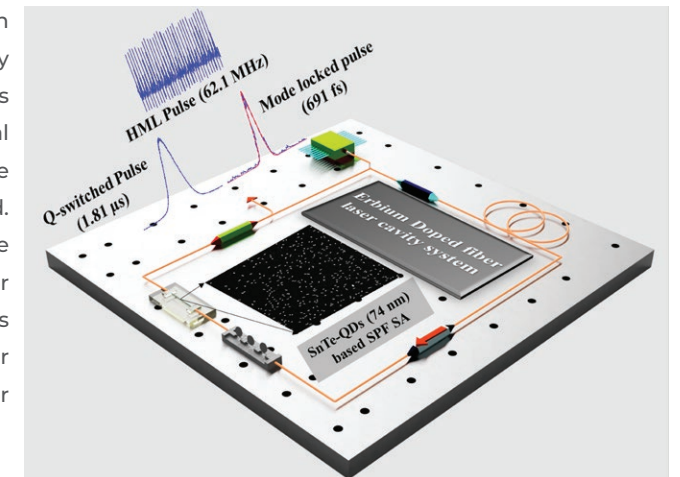
Human myopia, or shortsightedness is a common eye disorder in modern society, yet existing optical aids and refractive surgeries does not deal with the root cause of the disorders. PolyU developed a novel optic design of seamless concentric optical nanostructures and proprietary ultra-precision manufacturing and testing technology of the nanostructured defocus-incorporated spectacle (NDIS) lens for myopia control. The NDIS lens has been developed based on the emmetropization feedback mechanism of human eyes to control myopia by producing a primary image on the retina and a secondary image in front of or at the back of the retina to generate a myopic defocus which can effectively inhibit elongation of the eyeball to slow the myopia progression of school children. The NDIS lens addresses the market need for subversive improvement of the existing treatment of myopia for school children's eye health.

Innovation Features

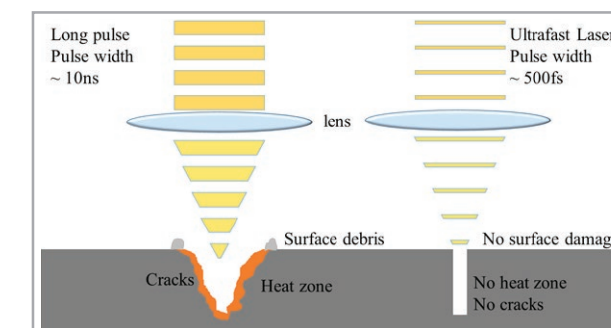
- Effective treatment of myopia for school children's eye health
- Adopts novel optic design and ultra-precision manufacturing technology which significantly reduces production cost

Nonlinear Optical Materials for Mode locked Ultrafast Laser Generation

Ultrafast laser means a short pulse laser whose pulse width is usually picosecond to femtosecond. This laser usually relies on mode-locking technology to generate continuous ultrashort pulses. By utilizing novel two-dimensional materials having nonlinear optical properties as saturable absorber, the generation of ultrafast laser are facilitated. This patented technology has great potential to replace the generally high-cost and single-wavelength semiconductor saturable absorber to trigger ultrafast lasers. Ultrafast lasers are widely used in a range of applications, such as laser surgery, communication, laser engraving, defense sector and scientific research.



▲ Ultrafast laser generation using Tin-Telluride QDs Saturable Absorber



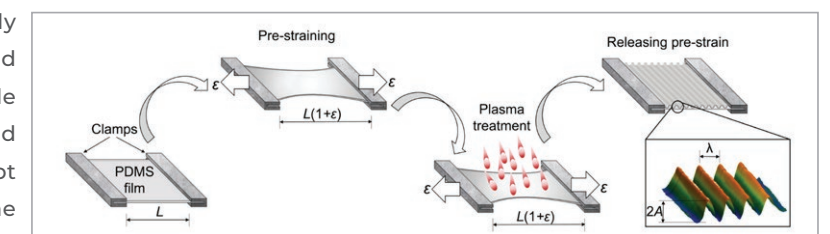
▲ Advantage of Ultrafast laser over long pulse laser for surface

Innovation Features

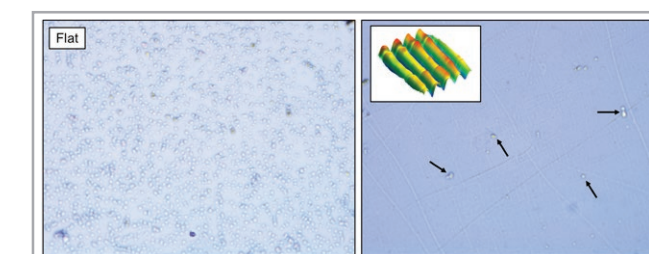
- Produces pulse lasers with broadband absorption, short recovery time, low saturation fluence and high modulation depth
- Versatile tunable operation quality per consumer requirements
- Facile and cost-effective fabrication process

Transparent Anti-Fouling Film

Submerged marine surfaces are quickly colonized by microorganisms, followed by the attachment of large-scale animals such as mussels, barnacles and tubeworms. If the surface needs to be kept transparent for optical applications, the biofouling proliferation and coverage is consequently problematic. This innovation uses nanoscale wrinkles onto a polymeric film to efficiently reduce biofouling while keeping the surface at a high-level optical transparency. It has the potential to be applied onto underwater cameras and sensors, as well as any surfaces that needs to be kept transparent and fouling-free, such as surgical cameras to facilitate visualization during intra-operative imaging.



▲ The main manufacturing steps of wrinkled transparent film



▲ Bacteria adhesion test shows extensive fouling in a flat surface vs optimal wrinkled surface with localized scattered attachment, highlighting our innovative anti-fouling result.

Innovation Features

- Reduces biofouling while keeping the surface at a high-level optical transparency
- Adopts a facile and cost-effective manufacturing process

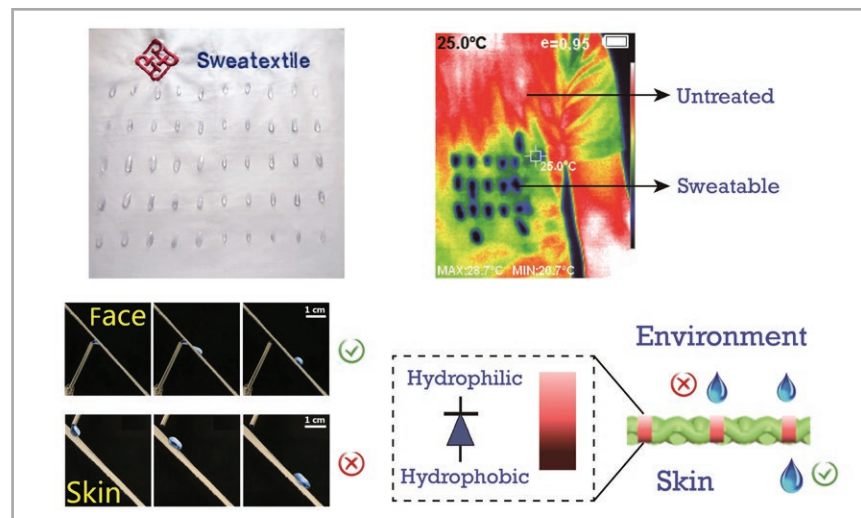
Sweatextile: A Nature-Inspired Textile of Unidirectional Water Transport and Dissipation for Moisture Management, Comfort and Protection



When the body produces excessive sweat, the clothing will be soaked and clammy, affecting comfort and lowering physical performance with the body required to consume extra energy for sweat management. Beyond existing wicking textiles, the Sweatextile adopts a nature-inspired innovation, quickly directing and dissipating excessive sweat as water droplets to the outer surface, keeping one dry, comfortable, and having more energy and endurance. This innovation can benefit a wide arrange of consumers such as outdoor enthusiasts and highly-active professionals - including athletes, medical personnel, construction workers and firefighters.

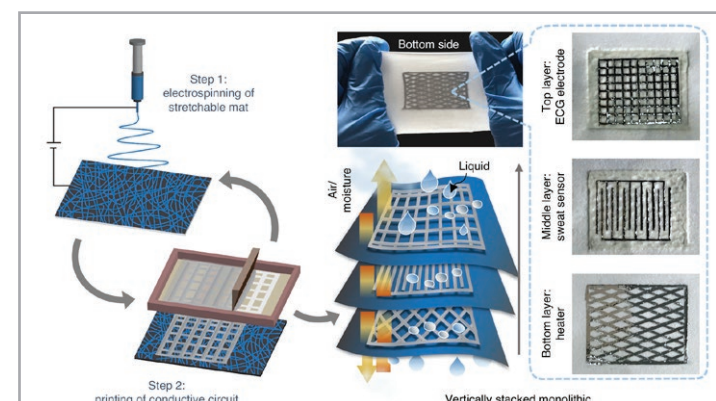
Innovation Features

- First 'Sweatable' textile material just like human skin!
- Ultra-fast one-way sweat transport outwards
- Reduces sweat retention and cling with high breathability
- Great resistance to rain and contaminated water
- Sustainable and scalable manufacturing process



Permeable Super Elastic Liquid Metal Fiber Mat enables Biocompatible and Monolithic Stretchable Electronics

Stretchable electronic devices conventionally built with elastomeric thin films show a lack of permeability, which not only impedes wearing comfort and creates skin inflammation over long-term wearing, but also limits the design form. To tackle this problem, an innovative liquid metal fiber mat (LMFM) is developed by simple coating or printing of liquid metal on an electrospun elastomeric fiber mat. Liquid metal hanging among the elastomeric fibers self-organizes into a laterally mesh-like and vertically buckled structure, which simultaneously offers high permeability, stretchability, conductivity and electrical stability. The continuous fabrication of multilayer LMFM enables a versatile and user-friendly platform to develop multi-functional stretchable electronics, including ECG and sweat sensors.

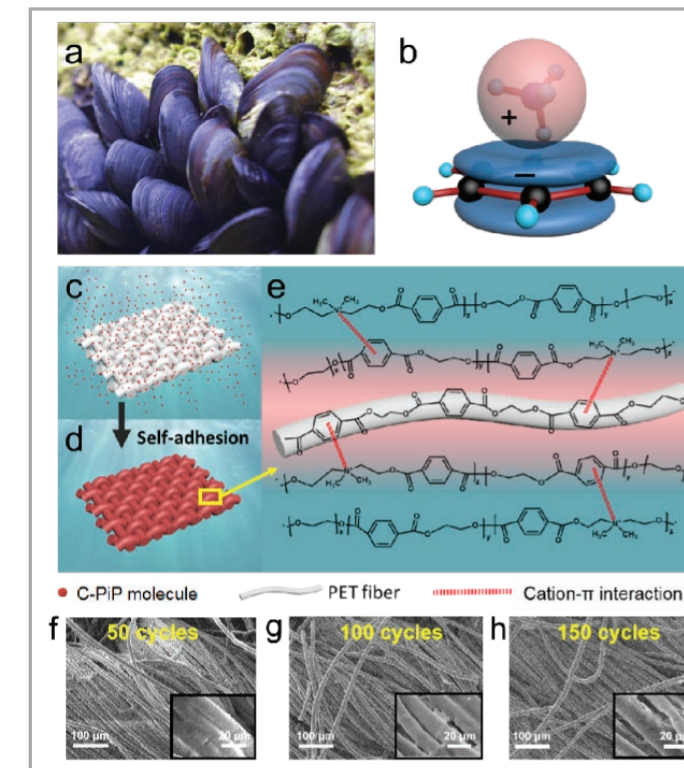


Innovation Features

- Achieves high-integration-density, multi-functionality and long-term wearing ability
- Smart adaptiveness to omni-directional stretching over 1800% strain
- Offers high permeability, conductivity and electrical stability
- Easily prepared by simple coating or printing of liquid metal

Bio-inspired Super-Hydrophilic Polymer C-PiP for the Modification of Polyester Fiber

Inspired by the strong underwater adhesion properties of mussels, a new and novel superhydrophilic polymeric molecule C-PiP has been developed with strong cohesion and adhesion property on Polyethylene Terephthalate (PET) fabric. During the wet application process, the cations serve as a vanguard to breach the hydrated ion layer on the PET fiber surface, allowing the facile self-adhesion of C-PiP on the PET surface without the need of any auxiliary that potentially



pollutes the water resources when discharged. Meanwhile, the new polymer can efficiently transform the hydrophobic PET fabric to a cotton-like absorbent material. Taking advantages of its strong adhesion, C-PiP targets polyester fabrics to achieve controllable one-way sweat transport to keep skin dry and comfortable, while the anti-microbial property of C-PiP provides a hygienic solution to wearers. This innovation can be potentially applied in polyester-based products, especially for sportswear, underwear, uniforms, as well as other functional textile products.

Innovation Features

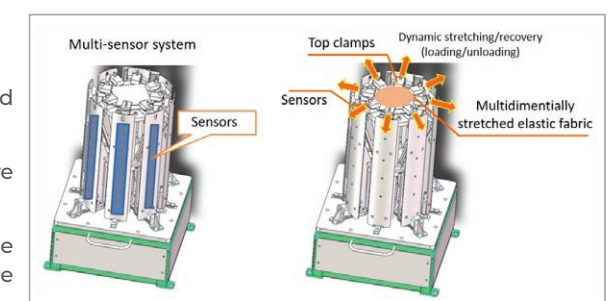
- Achieves controllable one-way sweat transport to keep skin dry and comfortable
- Enables antimicrobial property to maintain wearer hygiene
- Possess super-hydrophilicity - can withstand over 150 home laundry cycles!

3D Intelligent Dynamic Fabric Tension-Pressure Testing System

The fabric tension, pressure, and their interactions are the most important mechanical properties that significantly affect pressure function, biomechanical efficacy, treatment outcome and dynamic wearing comfort. Yet up till now, no technology and equipment are available in the market to directly test such dynamic tension-pressure properties of the elastic fabric. The new bionic 3D-IDFTP technology developed by PolyU is a breakthrough in the field of textile fabric measurements. Not only can it automatically and synchronically test mechanical tension and pressure properties of elastic fabrics with a controlled stretching ratio and velocity in both 2D and 3D scales, it can also intelligently analyze and display strain-stress-pressure curves and their interactive relationships in real-time. This new technology can be applied in fabric measurement and testing in textile manufacturing factories, experimental labs, standard agencies, and research organizations for quality control, performance assessment, material mechanical studies, and standard development related to functional textiles and garments.

Innovation Features

- Automatically and synchronically tests mechanical tension and pressure properties of elastic fabrics
- Intelligently analyzes and displays the strain-stress-pressure curves and their interactive relationships in real-time
- Measures multi-mechanical parameters - including tensile ratio, elongation recovery, fatigue, elastic decay and pressure comfort



Stay tuned with our research updates:



Contact RIO today!

Research and Innovation Office

The Hong Kong Polytechnic University
Hung Hom, Kowloon, Hong Kong

Email: rio.general@polyu.edu.hk

Tel: (852) 3400 2806

Fax: (852) 2334 8755

Website: www.polyu.edu.hk/rio



RIO Introduction



RIO Newsletters



Award Winning
Innovations