THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Excel x Impact

Spring 2021

PolyU honours

TEN DISTINGUISHED ALUMNI










Contents | Spring 2021

President's Message

My warmest congratulations to our distinguished alumni, staff and students, who were recently honoured with the Outstanding PolyU Alumni Award, President's Awards for Outstanding Achievement, and Outstanding Student Awards respectively. Their achievements are indeed a testimony to PolyU's accomplishments in nurturing dedicated talents who strive for excellence in their respective fields and make positive contributions to society with their passion and perseverance.

While sharing their joy and pride, I believe all achievements are dependent on hard work and good planning. During these past several months, the Task Force on Planning Exercise Proposal (PEP), together with all faculties, academic departments and other colleagues, dedicated enormous effort to the development of our PEP for the 2022/23-2024/25 triennium for submission to the University Grants Committee. The exercise offered an important opportunity for the University to revamp its educational and research programmes to meet the changing needs of society. The Task Force worked closely with faculties and academic departments in drawing up the PEP according to PolyU's strategic directions, planning parameters and societal needs. The PEP aims to fulfil our aspiration of providing the best holistic education and engaging in impactful research for the benefit of Hong Kong, the Nation and the world.

Spring has brought beautiful blossoms to our campus, adding liveliness and vibrancy. Let's stay well and healthy, and embrace the future with optimism.

Jin-Guang Teng
President

The Hong Kong Polytechnic University
香港理工大學

PolyU honours TEN DISTINGUISHED ALUMNI

With more than 80 years of proud tradition and ranking among the world's top 100 institutions, The Hong Kong Polytechnic University has nurtured more than 400,000 graduates, many of whom have become leaders in their professions.

In order to pay tribute to our distinguished graduates who have achieved illustrious accomplishments in their respective professions and have made significant contributions to the University and to the wider community, PolyU and the Federation of PolyU Alumni Associations have jointly organised the biennial Outstanding PolyU Alumni Award (OPAA) since 1996. Over the years, more than 80 alumni in various fields have been honoured.

This year marks the 13th OPAA presentation, and the University takes pride in honouring 10 accomplished alumni. We are proud of their dedicated work and commitment to giving back to society on different fronts. They are excellent testimony to PolyU's success in nurturing leaders for the world, inspiring the younger generation to follow their dreams and to shape the future.

Congratulations to our OPAA 2021 Awardees (in alphabetical order of last name)

Mr Jack Chan Hoi
Bachelor of Arts (Hons) in Accountancy, Hong Kong Polytechnic
Master of Corporate Finance, PolyU

"I have a keen interest in promoting green finance innovation, contributing to the development of green industries in China."

Mr Chan is Chairman of China, Regional Managing Partner of Greater China, and a Member of The Global Executive of Ernst & Young. With more than three decades of accounting experience, he has made significant contributions to advancing financial services consulting, assurance services and the adoption of FinTech in the industry. A strong believer in business transformation, Mr Chan was among the early advocates of green finance, helping to spearhead its development in the Mainland. He is an advisor for the "Research and Promotion on Sustainable Development Goals Impact Financing in China" project for the United Nations Development Programme China and China International Center for Economic and Technical Exchanges under the Ministry of Commerce.

Ms Janet Chen Lijuan
Master of Business Administration, PolyU

"As the Chairman of PolyU Pearl River Delta Alumni Network, I work towards strengthening the bonding between my alma mater and Chinese enterprises."

Chairman of Shenzhen Ebeca Beauty Technology Investment Co., Ltd., Ms Chen is a remarkable player in the health and beauty industry of Mainland China. As early as 1983, she introduced the French brand Ebeca to the China market and successfully acquired the brand in 1992. Since then, she started building her empire with a vertically integrated supply chain, encompassing more than 60 spa salons, a biotech company for own-product development, beauty schools, stem cell anti-aging treatment centres, organic farms and an investment company focusing on health and beauty-related opportunities. Ms Chen has earned countless accolades, such as Women with Outstanding Entrepreneurial Spirit in China, and she made it into the China Top 100 Outstanding Women Entrepreneurs and Shenzhen Top 10 Outstanding Women Entrepreneurs.

Mr Tino Kwan Wing-kuen
Higher Diploma in Industrial Design, Hong Kong Polytechnic

"Lighting is a visual language that reveals a city's unique character."

Founder and Principal Consultant of Tino Kwan Lighting Consultants Limited, Mr Kwan is one of the most celebrated masters in the world of lighting design, and has been a pioneer in green lighting and the energy conservation movement since the early 1980s. His unique vision in creating spaces with light and shadow, and his keen eye for exquisite details have earned him countless honours, including the Lifetime Achievement Award from Hong Kong Interior Design Association. He was also included in Interior Design Magazine China's Hall of Fame. His avant-garde work is found all over the world. Mr Kwan is passionate about passing on his knowledge and philosophy to younger designers, and is an active member of PolyU's mentorship programme.

Ir Dr Kelvin Leung Kai-yuen
Doctor in Business Administration, PolyU

"I strongly believe in the company's motto – connecting people and improving lives."

Ir Dr Leung, Asia Pacific Chief Executive Officer of DHL Global Forwarding (Hong Kong) Limited, oversees the company's operations in more than 20 territories. He has been a leading force in the move to embrace new technologies, especially the digitalisation process, and to implement flexible measures to cope with the unprecedented challenges posed by COVID-19. Reflecting his commitment to the industry and the welfare of its members, Dr Leung serves as the Honorary Chairman of Hong Kong Logistics Management Staff Association. He was named CEO of the Year (Logistics) in the Customer Relationship Excellence Awards, was listed in the International Who's Who of Professionals, and was shortlisted for the Cambridge Who's Who Supply Chain Leader of Efficient Consumer Response Golden Circle Awards. He has served on PolyU's departmental advisory committees and has been a frequent speaker at the University.

Mr Michael Ross
Higher Diploma in Institutional Management and Catering Studies, Hong Kong Polytechnic

"A thankful heart is indispensable for scaling new heights."

Mr Ross is the Vice Chairman of the Thailand-based conglomerate Charoen Pokphand Group (CP Group) and Co-chairman of CP Group's Commercial Real Estate. In 1997, he went to Shanghai and helped establish the first hypermarket "Lotus", which is now a megastore chain with more than 100 branches across the country. Leading CP's commercial and real estate businesses, he initiated the upgrade of Shanghai's Super Brand Mall and established a standardised management system. The Mall went on to win several awards for its innovative retail models. Mr Ross is not only a seasoned business leader, but also a humanitarian who cares about the community, supporting education, healthcare and disaster relief initiatives in China. In recognition of his important contribution, the Shanghai Municipal People's Government bestowed Silver and Gold Magnolia Awards upon Mr Ross in 2017 and 2020 respectively. He has a long-lasting bond with PolyU and actively participates in its student development and alumni activities.

The Hon. Alfred Sit Wing-hang, *JP*
Higher Diploma in Electrical Engineering, Hong Kong Polytechnic
Associateship in Electrical Engineering, Hong Kong Polytechnic

"Have faith and trust in people, build good credit over time."

Ir Sit has been Secretary for Innovation and Technology of HKSAR since April 2020. He previously worked in the Electrical and Mechanical Services Department (EMSD), working his way up to become Director of Electrical and Mechanical Services. Ir Sit is an ardent advocate of innovative technologies and has spearheaded the E&M InnoPortal at EMSD to forge a closer connection between Government units and the innovation and technology sector. Since the outbreak of COVID-19, he has been actively promoting R&D through encouraging the adoption of home-grown technologies to tackle the pandemic, and overseeing the provision of hardware and software to enable e-business and e-learning. Ir Sit is passionate about serving his professional community and alma mater. He is currently Chairman of the Departmental Advisory Committees of PolyU's Department of Building Services Engineering and Department of Electrical Engineering.

The Hon. Tony Tse Wai-chuen, *BBS*, *JP*
Higher Diploma in Surveying (General Practice Division), Hong Kong Polytechnic

"I am concerned about the development of young professionals."

Mr Tse is committed to the surveying and property development fields. Currently a Legislative Councillor representing the architectural, surveying, planning and landscaping sectors, he acts as a bridge between practitioners and the administration, successfully lobbying the Government on policies that impact the industry. Mr Tse is a Fellow Member of the Hong Kong Institute of Surveyors, Chairman of the Property Management Services Authority, a Non-official Non-executive Director of the Urban Renewal Authority Board, and a Member of the National Committee of the Chinese People's Political Consultative Conference. He also serves on various advisory committees under the Government. He was named Lifetime Achiever by the Royal Institution of Chartered Surveyors. Mr Tse enthusiastically supports PolyU's mentorship programme and its Department of Building and Real Estate, serving as a student mentor. He recently received the Outstanding Alumni Award from the Department.

Sr Augustine Wong Ho-ming, *JP*
Diploma in Building Studies, Hong Kong Polytechnic
Higher Diploma in Surveying (General Practice Surveying), Hong Kong Polytechnic
Advanced Higher Diploma in General Practice Surveying, Hong Kong Polytechnic
Master of Science in E-Commerce for Executives, PolyU

"I work towards enhancing professional and ethical practice within the industry."

Sr Wong, Executive Director and General Manager of the Property Development Department, Henderson Land Development Company Limited, has made a tremendous contribution to local real estate and housing development. He participated in the formulation of regulations governing real estate agents and the sale of residential properties. Under his leadership, Henderson became the most active player in urban renewal. He is a pioneer in brown field redevelopment and wet land restoration. He is also active in turning residential units pending redevelopment into affordable temporary housing, and assisted in the implementation of the largest transitional housing project in the New Territories. Sr Wong has served in various organisations and advisory committees under the Government. He was a Member of the Departmental Advisory Committee of PolyU's Department of Building and Real Estate and received the Outstanding Alumni Award from the Department.

Dr Alex Wong Siu-wah
Doctor of Business Administration, PolyU

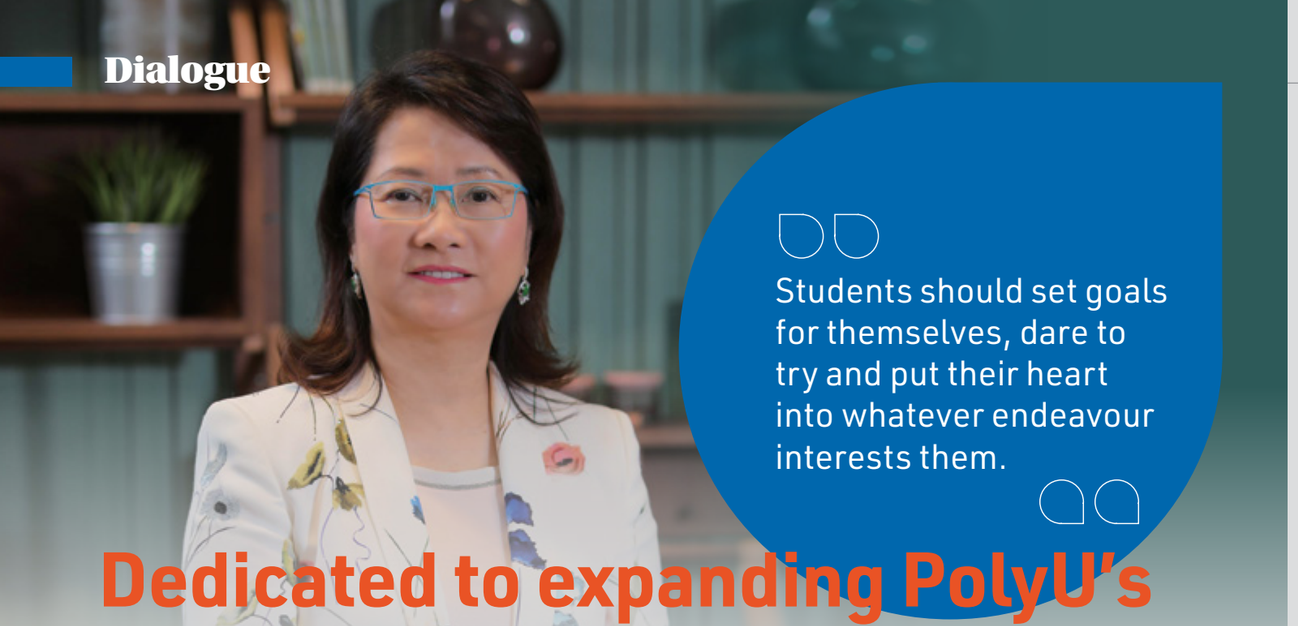
"A successful business should meet the needs of the market as well as society, be people-oriented and care for the environment."

Dr Wong is the Founder, Chairman and CEO of King's Flair International (Holdings) Ltd, a Hong Kong listed multi-national group specialising in kitchenware and household products. Applying a "Virtual Manufacturing" model, under which he leveraged the strengths of business partners for quality production without owning the factory or facility, Dr Wong has successfully expanded his business into key overseas markets and established partnerships with renowned brands worldwide. He cares equally about doing social good, and under his leadership, King's Flair has been an avid supporter of charitable agencies. Dr Wong has also been supportive of PolyU. He is an Honorary Life Chairman and a Member of the Governing Committee of the PolyU Foundation, a former Member of the Departmental Advisory Committee of PolyU's Department of Mechanical Engineering, and Chairperson of the PolyU-University Fellows Association Management Committee.

Ms Mary Yu Wah
Higher Diploma in Fashion and Clothing, PolyU
Bachelor of Arts (Hons) in Fashion and Textiles (Fashion and Textile Design), PolyU
Master of Design (Design Practices), PolyU

"Qipao has great potential and is enjoying rising popularity in foreign countries."

Ms Yu, a world-famous fashion designer, created her own brand upon graduation from PolyU. She is highly regarded for her creative designs of qipao, blending eastern and western elements, which shine on the world stage. Her prolific repertoire also consists of uniforms, including the chic performance apparel seen in the Hong Kong equestrian events of the 2008 Olympics. Ms Yu has won countless accolades, such as Forty under Forty by the *Perspective*, the Ten Outstanding Young Persons Selection of Hong Kong, Hong Kong Professional Elite Ladies Selection, and Hong Kong Culture and Creativity Industries Award. She has twice been the winner of China's Most Successful Design Awards. Some of her works are included in the permanent collection at the China National Silk Museum. Caring about nurturing talent, Ms Yu has taught and served as an adjudicator of contests at PolyU.



> Students should set goals for themselves, dare to try and put their heart into whatever endeavour interests them.

Dedicated to expanding PolyU's REACH and IMPACT

A Conversation with Chairman of the University Court Dr Katherine Ngan

Dr Katherine Ngan Ng Yu-ying is a distinguished entrepreneur and President of May Cheong Group. She is also a strong supporter of PolyU, serving as the Chairman of the University Court since January 2020 and Chairman of the PolyU Foundation since 2018. Over the years, Dr Ngan had served in several different positions, including Council Member of PolyU, Director of the Hotel ICON Board, and Chairman of the Organising Committees of Fund-raising Dinners of the University. Her outstanding achievements and contributions have seen her win a string of honours, such as the Hong Kong Young Industrialist Award, and an Honorary Doctorate of Business Administration from PolyU.

For more than 20 years, you have been an ardent supporter of PolyU. What has impressed you most about the University over the years?

The University's steadfast commitment to producing research and innovation that makes a positive contribution to society has always impressed me the most. An inspiring example of this is the way in which PolyU leveraged its research and scientific expertise to help the community combat the pandemic. This included developing the world's most comprehensive fully automated diagnostic system that can detect up to 40 infectious respiratory pathogens, including COVID-19, in one test within an hour. In addition it used 3D printing technology to design and produce face fields for local medical professionals.

Over the years, I have also been impressed by the new facilities at the University that offer students an interactive and dynamic learning environment. For instance, PolyU's Innovation Tower has become a landmark in Hong Kong and provides a creative and interdisciplinary setting in which PolyU's design students can thrive. Hotel ICON, the University's unique teaching and research hotel, is equipped with state-of-the-art facilities and gives students a valuable learning experience in a real-life hospitality environment. It is also one of the reasons why PolyU's School of Hotel and Tourism Management is ranked among the top in the world.

As Chairman of the University Court, can you explain how the Court helps with the University's development?

The Court advises the University on matters of broad policy and direction, as well as enhancing its profile. Its members are elites from different sectors. They can provide counsel, share their experiences, and broaden the University's network in order to enhance its development. They are also keen to give advice and help connect PolyU scholars with companies, so that their inventions or research output can be commercialised for the benefit of society. To move with the times, we can also invite leaders from emerging fields, such as biotech and fintech, to join the University Court.

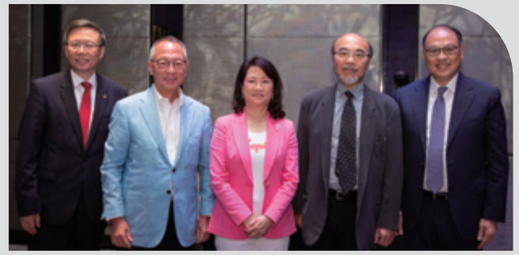
You became the Deputy Chairman of the PolyU Foundation in 2014 and were made Chairman in 2018. How have you helped to promote public recognition and support for the University in those roles?

PolyU has gained global recognition for its quality education and research, and it has developed close ties with business and industry. The University has nurtured professionals who are highly sought-after talent in society, such as occupational therapists, physiotherapists, optometrists, nurses, and product designers, all of whom have the capacity to contribute to the betterment of the community. I have advocated for the skillsets and competence of the University's graduates to different sectors, to help them understand how PolyU's talent can meet their evolving needs.

The PolyU Foundation also plays a match-making role, helping the University source funding for specific research projects. Potential donors can visit the disciplines for which the University is famous, and see for themselves the many impactful projects that can benefit different target groups. Over the years, the Foundation has facilitated contributions from benefactors who are keen to support PolyU's development in different aspects, such as enhancing its facilities, promoting academic and research initiatives, as well as establishing specialist centres. We are so grateful to our supporters.

How do you think PolyU can assist with Hong Kong's re-industrialisation drive?

Hong Kong has entered the industrialisation 4.0 era in which new game-changing industries and technologies are becoming prominent. Due to the pandemic, people's lifestyles and the business environment have also been transformed with remote working and digitisation becoming the new norm. PolyU should step up its research in emerging



Dr Ngan (centre), and (from right) PolyU Council Chairman Dr Lam Tai-fai, Honorary Court Chairmen Dr the Hon. Victor Lo and Dr Roy Chung, and President Jin-Guang Teng

technologies which are changing our world, such as artificial intelligence, new materials, automation, and bio-medical technology.

How can young people develop an innovative mindset and an entrepreneurial spirit?

By setting goals for themselves. By daring to try, not being afraid of failure, and having a forward-thinking mindset. I also believe that students should visit enterprises more. Whether it is a small or large enterprise, there will be crucial lessons students can learn from it, such as the reasons for its success or mere survival. Students should put their heart into whatever endeavour interests them, as passion is a key ingredient of success.

In addition to professional expertise, what personal attributes should be nurtured among university students?

The ability to get along, communicate with others and work in a team is incredibly important. Students should also have an open mind and seek to expand their personal network. I like making friends with people of different ages and backgrounds. To me, having exchanges with diverse people expands my horizons and gives me the opportunity to engage in lifelong learning. It is also important to have an international outlook, and to stay positive. Successful entrepreneurs are not easily deterred by setbacks.

May Cheong Group has more than 10,000 staff worldwide, what is the secret of your success? What is your motto?

My motto is "Keep challenging yourself, and never give up." In running my business, I am also people-oriented. By people, I mean both staff and customers. Many of my clients have worked with me for decades because we have established mutually beneficial relationships. I am still passionate about learning and taking on new challenges. Opportunities abound in today's world, but you have to seize them quickly, otherwise they will be gone.

> We aim to nurture more dynamic graduates who are eager to try new things, think positive and be creative.

Advancing an INTERDISCIPLINARY framework to foster EDUCATION & RESEARCH

A Conversation with Deputy President and Provost Professor Wing-tak Wong

With extensive management experience and an in-depth understanding of PolyU, Professor Wing-tak Wong assumed the post of Deputy President and Provost in December 2020. He graduated with a BSc first class honours from The University of Hong Kong, and obtained his PhD degree from the University of Cambridge in 1991. Professor Wong joined PolyU in 2009. Over the years, he has held various leadership positions, including Head of Department, Dean of Faculty, and Deputy Dean of the Shenzhen Research Institute. As the Chair Professor of Chemical Technology, Professor Wong is an internationally recognised scientist with outstanding research achievements.

You joined PolyU in 2009. How has PolyU changed over the past decade?
PolyU has evolved into a research university with a very vibrant academic atmosphere. We have developed multidisciplinary research areas, and a multicultural student population. We are among the first tertiary institutions in Hong Kong to develop connections with the Mainland. Also, we have established various regional bases over the years. We have furthermore cultivated strong partnerships with the industry, which reinforce our ability to actively translate research outcomes into practical solutions which address societal and commercial needs. This is nicely guided by our University Motto.

What is your vision for the future development of PolyU's graduates and academic programmes?
We aim to nurture more dynamic graduates who are eager to try new things, think positive and be creative. It is important for us to equip students with knowledge in cutting-edge technologies, such as AI, data science and analytics, as well as an innovative mindset. We also encourage students to actively engage in entrepreneurship.

We have a long history and good track record of producing exceptional talent for different professions. In response to the rapid transformation of the economy and society, we are keen to further enable our graduates to take the lead in the development of the new economy over the coming decades.

The University will change its curriculum structure by introducing programmes that incorporate innovation and research-based elements in order to cultivate a vibrant entrepreneurial spirit and creative outlook among our students. We will also equip students with scientific knowledge in their areas of interest. Besides this, we encourage students to pursue their own endeavours in research with the provision of various support measures, ranging from funding incentives to research infrastructure. Ultimately, we aspire for our students to be able to translate their research discoveries into products of value to the market and society. Some of them may take the career adventure of forming spin-off companies or their own start-ups.

What is your vision for PolyU's research development?
A robust framework or structure to foster interdisciplinary research is essential to the University. The President has advocated the establishment of the PolyU Academy for Interdisciplinary Research. Also, we have recently set up seven more research institutes covering different aspects of life, from healthcare, clothing, food, transportation to accommodation, while drawing talent from different disciplines. Having the right structure in place will facilitate our synergistic efforts in advancing interdisciplinary research that tackles important areas of concern to society.

On the other hand, we need to enhance our academic strength and tap into the resources in Mainland China, as well as leverage the vast opportunities in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA), as well as the countries and regions under the Belt and Road Initiative. We hope to capitalise on our research competence in order to participate in and pave the way to lead more projects on a national and international scale.

You are currently still leading a sizeable research team. What drives your devotion to research?
I am always passionate about research and discovery. Research brings tremendous fun to me. I am dedicated to further promoting an active research culture at the University, not only among academic colleagues but also among our undergraduates. After all, the responsibility of a university is not just to pass on existing knowledge, but also to generate new knowledge, which hinges on research.

Could you share some words of encouragement for young scholars/researchers and students?
Young talent can always be bold, think big and think out of the box in research endeavours, starting with identifying a research focus. We can establish a strong foothold after sailing through all sorts of challenges using our intelligence, agility and diligence. Challenges sharpen our mind, strengthen our skills, and pave the way for success ahead.

How does your previous management experience help with your current position as Deputy President and Provost?
My experience in different positions, from a teacher, researcher, department head to faculty dean, has furnished me with a good understanding of the concerns across different parties, including students, colleagues, academics and industry. I understand the importance of aligning the interests of and facilitating the communication between different parties, which is instrumental in formulating policies for the development of the University.

Do you have a motto that you live by?
I find two mottoes most inspiring to me.

"Strive not to be a success, but rather to be of value." *Albert Einstein*
We should not aim to be successful only for ourselves, but rather we should aim to ultimately generate actual value to contribute to society. It resonates with the University Motto, "To learn and to apply, for the benefit of mankind."

"Never feel tired of learning or teaching others" (學而不厭，誨人不倦) *Confucius*
It reminds me to keep working hard and drives away any fatigue during teaching, research or work.

How do you spend your free time?
I enjoy watching movies a lot. Those related to science fictions are always among my favourites. This pastime helps me to unwind and refreshes my mind from daily work.

RESEARCH INTERNSHIPS IN CANADA

to broaden students' horizons

PolyU has recently signed an agreement with Mitacs, a Canadian not-for-profit organisation offering a Globalink Research Internship (GRI) Programme with over 70 universities across Canada. According to the agreement, from 2022 to 2024, as many as 60 PolyU full-time senior undergraduates of any discipline will have the opportunity to participate in research internships at Canadian top universities, including McGill University, the University of Toronto and the University of British Columbia.

In each year of the scheme, up to 20 PolyU Year 3 or Year 4 students will travel to Canada during the summer to undertake a 12-week research project under the supervision of a professor at a Canadian university. Students can choose their research topics from a variety of disciplines, from science, engineering and mathematics to humanities and social sciences. They will also have opportunities to participate in industry events as well as training sessions on entrepreneurship, problem-solving, project management, communication, and teamwork. Each participating student will furthermore receive CAD$12,000 in funding support.

"PolyU is delighted to partner with Mitacs through the GRI programme," said Professor Ben Young, PolyU Vice President (Student and International Affairs). "Our students are very often encouraged to demonstrate an enthusiasm for research and intellectual curiosity during their studies at PolyU. The summer research internships at Canadian institutions offer an excellent opportunity with funding support for students to acquire valuable hands-on research skills as well as to gain international experience."

Dr John Hepburn, CEO and Scientific Director of Mitacs, said, "Mitacs is pleased to embark on our first partnership with PolyU as we work to build meaningful international networks. These connections not only support Canadian innovation, but also provide important opportunities for PolyU students to develop skills and competencies that will help them succeed."

In the coming round of application, eligible PolyU students can apply for the internship from July 2021. After the interview and evaluation process, students will be offered a project match, and Mitacs will confirm the student placements by February 2022. The first group of selected students are expected to depart for Canada starting May 2022.

Leveraging its extensive network with renowned universities, institutions and industry partners worldwide, PolyU infuses students with a global perspective through its academic programmes and vast co-curricular activities. Through participating in internship, exchange, Service-Learning and leadership programmes offered by the University, students gain rich international exposure. These experiences are instrumental for their development into global-minded leaders and socially responsible citizens.

PolyU hosts symposium on learning and teaching in times of crisis

■ *Professor Mary Wright*

■ *Professor David Carless*

■ *Professor Alexander Taffe*

■ *Professor Irwin King*

PolyU was proud to host the Excellent Teachers on Teaching Excellence Symposium 2021 to share insights on pedagogy and exchange experiences of best practices. In the face of the COVID-19 pandemic, the theme of the symposium was "Turning Challenges into Opportunities for Learning and Teaching in Times of Crisis". More than 400 academics and students from Hong Kong, Macau, Singapore, Germany, USA and other parts of the world participated in the event.

In his opening speech, Professor Jin-Guang Teng, President of PolyU, highlighted how the COVID-19 pandemic had changed the higher education landscape. He said: "In the new normal, a hybrid mode of teaching and learning activities could be employed for the internationalisation of classes. Local students could attend a class in person, interacting with non-local students from afar via online channels, fostering a beneficial exchange of perspectives between students from different backgrounds. The experience of online teaching will have an enduring effect, and real-time online teaching will become an important component of university education after the pandemic."

The Symposium consisted of four plenaries and four corresponding discussions in which a number of esteemed experts from local and overseas universities shared their insights. Topics included what the new normal would be in higher education, how to conduct assessments during the pandemic, how to ensure the desired learning outcomes are achieved through online courses, and different approaches for carrying out practical sessions.

Guest speakers included Professor Mary Wright, Associate Provost of Teaching and Learning at Brown University, USA; Professor David Carless from The University of Hong Kong; Professor Alexander Taffe from the University of Applied Sciences Berlin, Germany; and Professor Irwin King from The Chinese University of Hong Kong.

The outbreak of the pandemic has accelerated PolyU's adoption of technology and new approaches to teaching and learning. To help teachers and students adapt to the new pedagogy, the University has offered a range of support, including services such as live eLearning Clinics, a WhatsApp enquiry service, online webinars, and a new website with ample resources on online learning, teaching and alternative assessment. Through these services and a number of other initiatives, PolyU has explored the new modality for learning and teaching online. At the Symposium, PolyU academics and students, among others, shared their experiences of adapting to this new mode of education.

PolyU's Educational Development Centre has organised Excellent Teachers on Teaching Excellence Symposiums since 2009. It is a major platform to celebrate good teaching, and share insights on higher education and teaching philosophies from academic faculty including the recipients of the President's Awards for Outstanding Achievement in Teaching.

■ *(Clockwise from top left) Professor Mary Wright, PolyU Interim Vice President (Research and Innovation) Professor Daniel Shek, Dean of Faculty of Humanities Professor Li Ping, alumnus Mr Wang Zhihan and student Kaleb Ben Naveed share their insights at the Symposium.*

Real-time lab enables experiments anytime, anywhere

For science students, conducting experiments in a laboratory is a key part of their studies but they often face time, resource and equipment constraints. The COVID-19 pandemic has created further challenges for laboratory classes. Supported by the Quality Education Fund, a team from PolyU's Department of Applied Physics (AP) has provided a solution to these issues by creating a web-based lab. Named "Borderless Lab 365", it enables experiments to be conducted anytime, anywhere.

■ *"Borderless Lab 365" enables students to operate remotely real lab equipment set up in PolyU to generate experiment results.*

The student-centered lab enables remote experiments to be set up in PolyU and performed according to commands given by users, who can monitor the experiments through live cameras, retrieve data and obtain results in real-time. Nine experiment modules are available in the subjects of physics, chemistry and biology, ranging from electromagnetic induction, visible spectrum and bacterial growth to photosynthesis and the greenhouse effect.

The innovative platform contributes to PolyU's efforts to promote STEM (Science, Technology, Engineering and Mathematics) education and facilitate the learning and teaching of STEM-related subjects at university and secondary school levels. The free platform has already been used by more than 100 secondary school teachers and 700 university and secondary school students. Project leader Dr C. L. Mak, Associate Professor, Department of Applied Physics, explained: "Unlike virtual labs which just simulate experiments, our platform allows students to remotely operate the real lab equipment to conduct experiments with the help of a webcam. Open 24 hours a day, the platform enables self-regulated learning anytime, anywhere through repeated experiments to consolidate findings and strengthen students' capabilities in data analysis."

■ *(Front row, from right) Dr C. L. Mak, Dr C. W. Leung, (back row, from right) Dr K. L. Jim and Dr S. H. Choy developed the "Borderless lab 365" which enhances STEM learning for students.*

"Borderless Lab 365" has been well received by users, including schools, teachers and students. It has provided a solution for schools, saving them the costs of purchasing and maintaining bulky lab equipment, as well as offering a risk-free lab environment for students. Based on the experimental data and analysis supplied by students, teachers can evaluate students' abilities and provide appropriate guidance. Meanwhile, students can apply different parameters to their experiments, repeating trials to gather results and practise correct experimental approaches.

The lab development project was awarded the "Asia Gold Award" in the Wharton-QS Stars Reimagine Education Competition. It is recognised for creating a novel, true-to-life remote laboratory to enhance students' understanding of experimental methodologies and outcomes.

The remote lab is part of the centralised experimental platform developed by the project team. The platform also includes three mobile apps: "AP Sensor", "Lab in Your Pocket" and "AR in Physics". "AP Sensor" turns users' mobile phones into a portable lab, enabling teachers to co-create experiments with students in their everyday environment. "Lab in Your Pocket" enables students to perform experiments at their own pace and manner, while "AR in Physics" makes abstract physics concepts easier to understand through using augmented reality (AR) technology.

PolyU research projects awarded UGC funding

The University has recently been awarded funding from the University Grants Committee (UGC) for five research projects, covering topics related to the COVID-19 pandemic, smart buildings, energy storage, as well as live-cell and animal tissue imaging. The total funding granted exceeds HK$26 million.

One-off Collaborative Research Fund Exercise Group Research

Professor Hao Jianhua
Department of Applied Physics

Multi-level synergistic COVID-19 point-of-care diagnostics based on upconversion luminescence biosensing platform (HK$8,408,102)

A diagnostics platform will be designed and fabricated to enable multi-level analysis of characteristic genes, antigens and antibodies of SARS-CoV-2. The analysis will provide new insights into sensing techniques for SARS-CoV-2 biomarker detection. As a tool to guide clinical treatment, infection control and vaccine development, this platform can facilitate rapid, low-cost and highly accurate diagnosis.

Dr Horace Mui Kwok-wai
Department of Building Services Engineering

Effective ventilation strategies for mitigating infection risks in hospitals (HK$4,429,517)

Computational modelling of expiratory droplet dispersion, transportation and deposition will be employed to evaluate the infection risk in hospitals. The risk of exposure to respiratory viruses SARS-CoV-2 and H1N1 will be explored and an exposure assessment indicator will be developed. The findings will help develop strategic ventilation proposals for hospitals, balancing cross-infection risk and energy consumption.

Collaborative Research Fund 2020/21 - Collaborative Research Project Grant

Professor Wang Shengwei
Department of Building Services Engineering

Development of next-generation key technologies for smart buildings (HK$5,840,000)

On the basis of emerging information technology, data science and distributed real-time optimisation, this project will adopt an interdisciplinary approach to advance building automation technologies for next-generation smart buildings by means of energy system real-time control optimisation and diagnosis as well as IoT-enabled building automation. It will develop advanced technologies and engineering tools that define the next generation of smart buildings, tapping into the potential of a major increase in energy efficiency and distributed intelligence.

Professor Ni Meng
Department of Building and Real Estate

Durable and high-performance zinc-air flow batteries for energy storage (HK$4,200,000)

This project will investigate the effects of flowing electrolyte on the chemical and physical processes of the zinc electrode and air electrode. Advanced in-situ visualisation techniques and ex-situ characterisations will be applied, and electrochemical tests will be conducted. New electrode materials will also be explored. The project will contribute to the development of high-performance and durable batteries for energy storage.

Collaborative Research Fund 2020/21 - Collaborative Research Equipment Grant

Professor Thomas Leung Yun-chung
University Research Facility in Life Sciences

A super-resolution fluorescence microscopy platform for live-cell and animal-tissue imaging (HK$3,577,125)

It is a proposal to acquire a stimulated emission depletion microscope for the University Research Facility in Life Sciences. Its features include multiple depletion lasers to improve fluorescent dye compatibility, time-gated signal detection to improve lateral resolution, and an additional depletion light path to improve axial resolution. This super-resolution microscope will support research in cell and cancer biology, as well as neuroscience and neurological diseases.

Through its interdisciplinary research, PolyU is dedicated to expanding knowledge, addressing societal needs and making a positive impact on the world.

Wearable device helps STROKE PATIENTS RECOVER ARM MOVEMENT

PolyU researchers leverage neuroscience, kinematics and artificial intelligence to develop a smart wristwatch that stimulates patients to move paralysed arms

Strokes are the second highest cause of death and the third highest cause of disability in the world. In Hong Kong, strokes are among the most common causes of hospital admissions. Stroke survivors not only account for the highest number of days spent in hospital, but 70% of them have to live with paralysis or weakness, known as hemiparesis, in their arms for the rest of their lives.

To help speed up the recovery of stroke patients with hemiparetic arms, Professor Kenneth Fong, Department of Rehabilitation Sciences, has spent more than a decade developing an innovative treatment method. Professor Fong recently received HK$9.19 million from the Research Grants Council's Research Impact Fund (RIF) for his project "Wearable closed-loop neural control 'remind-to-move' (RTM) treatment for hemiparetic upper extremity in people with hemiplegia after stroke".

Smart wristwatch reminds stroke patients to exercise paralysed arm

The RTM treatment was first developed by Professor Fong and his research team in 2009. It was the first treatment of its kind to promote the use of a hemiparetic arm as a result of non-use in adult stroke patients or people with cerebral palsy. The treatment uses a sensory-cueing wristwatch, which is strapped to the patient's affected arm and emits vibration signals at fixed intervals, to remind the patient to do exercises as instructed by therapists. The wristwatch's built-in sensor detects and records the arm's movements for therapists to analyse. This pioneering treatment enables rehabilitation to be integrated into patients' daily lives to achieve maximum outcomes.

With patents filed in the US and Mainland China, the RTM wristwatch is now being used in 16 public hospitals in Hong Kong, and the Kessler Rehabilitation Center in the US to treat patients with unilateral inattention and trigger upper limb motor priming. RTM was a completely new concept in physical rehabilitation when it was first developed, and it has had a big impact on patients. "The treatment has benefitted more than 1,000 patients with hemiplegia, who showed significant improvement in the strength, co-ordination and functioning of their arms," Professor Fong said.

In 2020, the research team developed a second-generation device with funding support from the Germany-based Caspar Health Limited and the Hong Kong Young Women's Christian Association. The new device is paired up with an app that enables therapists to set time schedules for patients to exercise. Patients can then follow videos in the app to complete the exercises selected by therapists. The app also records the range of motions achieved during exercises, providing feedback for patients and therapists. The new device has been incorporated into the two organisations' telerehabilitation systems, which provide remote rehabilitation.

- *(left) The first-generation 'remind-to-move' wristwatch emits vibration signals to remind patients to move their hemiparetic arms.*
- *(right) Paired with an app, the second-generation wristwatch enables patients to follow videos selected by therapists to exercise their hemiparetic arms.*

The team has already published 10 papers on the research findings of RTM treatment in reputable journals.

Advanced smart wearable device under development

With the support of the RIF, Professor Fong is exploring how to enhance RTM treatment further through a third-generation device that leverages technological advances. Supported by local and Mainland industrial partners, he plans to harness kinematics, neuroscience and artificial intelligence to develop a closed-loop wearable device. It will stimulate the hemiparetic arm based on a machine learning algorithm developed by capturing the affected arm's actual activities and comparing them with those of the non-affected arm.

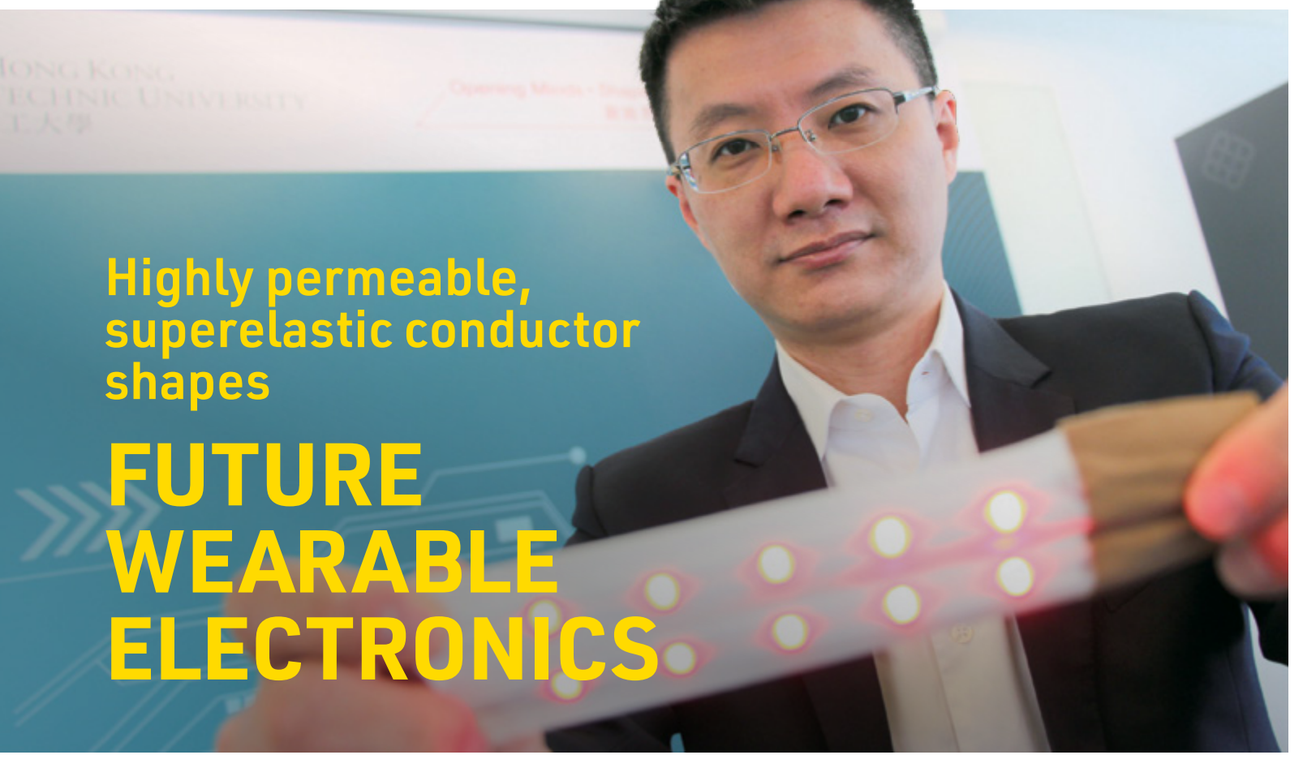
The new closed-loop treatment will facilitate motor control in a more natural way and improve the brain's ability to adapt to the environment and adjust based on experience, enabling patients to make a better recovery.

On the scientific front, the project will enable researchers to establish the connection between patient's self-initiated movements and external assistance provided by the new device. It will also highlight the development of wearable neuroelectronic augmentation devices for patients with impaired motor functions due to neurological diseases.

"The RTM treatment aims to motivate patients to help themselves in the rehabilitation process. Our ultimate goal is to provide a simple solution for people suffering from strokes to recover at home and return to normal life, without the presence of a therapist," Professor Fong said.

Alongside benefitting thousands of stroke patients, the science behind the development of this novel device will lead to further research and breakthroughs in the field of stroke rehabilitation in the coming decades.

- *Professor Fong will use motion capture equipment (right) and transcranial magnetic stimulator (bottom) to analyse arm movements in the new project.*



Highly permeable, superelastic conductor shapes

FUTURE WEARABLE ELECTRONICS

Researchers at PolyU have developed a new type of stretchable conductor that is highly permeable and superelastic with good conductivity. The new conductor serves as a platform enabling the making of monolithic stretchable electronics that integrate many components in a small area, provide multiple functions and endure hours for wearing. Potential applications include health monitoring devices, soft robotics and on-skin electronics.

Wearable technology such as fitness trackers and smartwatches are everywhere nowadays. Smart glasses and biometric apparel are gaining momentum. Electronic skin and electronic eye are no longer sci-fi inventions. As the range of wearable technology products expands, industry insiders predict wearable gadgets is the next big market after smartphones.

Stretchable electronics are innovating rapidly. Devices with electronic circuits embedded in substrates are found as skin electonic patches and biomedical implants in the healthcare industry. Currently, stretchable electronics are manufactured with impermeable elastic thick films. This method rules out multi-layered designs and hinders the development of devices with advanced functionalities. Low-permeability devices may also irritate the skin and cause inflammation and other health issues when wearing the devices for a long time.

New type of conductor - superelastic and highly permeable

A PolyU research team, led by Professor Zheng Zijian of the Institute of Textiles and Clothing (ITC) with interdisciplinary academics from the Department of Applied Physics (AP) and the Department of Biomedical Engineering (BME), has recently made a breakthrough in a highly permeable and superelastic conductor. Their research "Permeable superelastic liquid-metal fibre mat enables biocompatible and monolithic stretchable electronics" was recently published in *Nature Materials*.

By coating or printing liquid metal onto an elastic electrospun fibre mat, the resulting LMFM becomes stretchable (left) and highly permeable (right) at the same time.

This novel conductor is called liquid-metal fibre mat (LMFM). The process of producing LMFM takes two major steps. First, liquid-metal is coated or printed onto a fibre mat during a special production method called electro-spinning. The fibre mat has the elastic properties of natural rubber. Second, the coated mat is stretched repeatedly until the liquid metal forms a porous buckled film hanging among the fibres.

Eutectic gallium-indium alloy (EGaIn) is selected to manufacture the LMFM as the conductive component for printing on a stretchable mat made of poly(styrene-block-butadiene-block-styrene), or SBS.

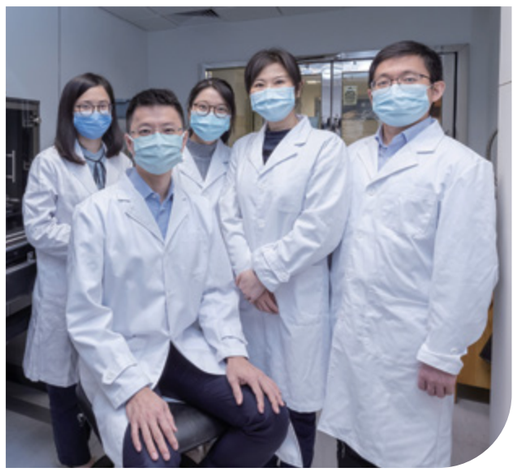
"EGaIn is a type of liquid metal commonly used in soft electronics, such as flexible printed circuit boards," Professor Zheng said. "It can be maintained in a liquid state under room temperature and has low viscosity, high conductivity and low toxicity. When exposed to air, it forms a thin solid layer of oxide (Ga_2O_3) rapidly on the surface and becomes soft and stretchable. And SBS is a material usually used for rubber products, such as gloves or balloons."

Therefore, the LMFM is super-stretchable and highly permeable. A sample made in the laboratory shows its moisture permeability is 22 times higher than a regular medical patch. It also retains stable conductivity in tensile testing. When further tested on rabbit skins, the LMFM showed excellent biocompatibility without irritation.

Multi-layered design to serve multiple functions

The research team also tested the effectiveness of a multi-layered LMFM. The researchers stacked three layers of printed EGaIn electrical circuits on monolithic elastic mats. Each layer acts respectively as an electrocardiography (ECG) sensor, a sweater sensor and an electrothermal heater. The three-layered sample, with a total thickness of merely 1 mm, performed all three functions effectively. The test indicated the stacked architecture of the LMFM suits to make multi-purpose wearables that can be worn for a long period.

The Hong Kong Scholars Program and the Research Grants Council of Hong Kong are the main funders of this project. The research team will continue to improve the performance of the LMFM, which shows great potential in health monitoring devices, soft robotics, on-skin electronics and prosthetics. The team strives to develop various healthcare-related electronic devices and systems, and prioritises producing wearable electrocardiographic monitoring equipment.



Professor Zheng Zijian (front) and research team members (from left) Dr Huang Qiyao, Research Assistant Professor of ITC; Miss Zhuang Qiuna, PhD student; Dr Zhao Xin, Assistant Professor of BME; and Dr Chai Yang, Associate Professor of AP

PolyU academic-led start-ups and researchers WIN SIX AWARDS at 2021 Inventions Geneva Evaluation Days

PolyU's scholars are committed to translating research outcomes into viable solutions that have a real-world impact. The University also offers significant support to foster entrepreneurship among academics and students to advance social and economic developments.

At the Special Edition 2021 Inventions Geneva Evaluation Days – Virtual Event held in March, PolyU scholars won three Gold Medals and three Silver Medals for their inventions in the fields of healthcare, environmental monitoring, smart cities and automotive safety. Two of these winning innovations have already been commercialised through PolyU-supported start-ups led by the University's researchers. The recognition PolyU achieved is not only a testament to the University's research excellence, but also demonstrates the strength of PolyU scholars in transforming research breakthroughs into real-world solutions.

Awards won by PolyU academic-led start-ups

CareCoatex™: A Biomaterial-based Core-Shell Particles for Safe and Effective Antibacterial and Antiviral Applications
Principal Investigator: Professor Pauline Li Pei | Department of Applied Biology and Chemical Technology | Co-founder of Grand Rise Technology Limited (a PolyU academic-led start-up)

Gold Medal

The research team has developed a biocompatible, non-toxic and eco-friendly antibacterial and antiviral coating, which has been commercialised under the brand name CareCoatex™. It provides both contact killing and time-release killing for up to six months. With proven effectiveness for rapidly killing 99% of common bacteria and viruses, the coating is ideal for disinfection, contamination control and epidemic prevention. CareCoatex can be sprayed at room temperature and in normal conditions, making it easy to apply to various surfaces.

Liverscan: Palm-sized Real-time B-mode Ultrasound Imaging Guided System for Liver Fibrosis Assessment
Principal Investigator: Ir Professor Zheng Yongping | Henry G. Leong Professor in Biomedical Engineering Department of Biomedical Engineering | Founder of Eieling Technology Limited (a PolyU academic-led start-up)

The Liverscan is a palm-sized portable tool for conveniently detecting and staging liver fibrosis, especially in the early stages of the disease, through taking non-invasive measurements of liver stiffness. It features a PolyU-patented technique which uses a real-time image guided process of transient elastography to enhance the accuracy of measurements. The system provides a safer, more effective and comprehensive diagnostic solution.

Silver Medal

Awards won by PolyU academics

Smart City Platform: A Comprehensive System for Spatial Data Infrastructure
Principal Investigator: Professor John Shi Wenzhong | Otto Poon Charitable Foundation Professor in Urban Informatics | Department of Land Surveying and Geo-Informatics

Gold Medal

The Smart City platform incorporates a series of the latest patented technologies in 3D city modelling, AI-based urban object cognition, as well as spatial big data analytics and visualisation. The platform can be used to acquire and process massive urban spatial information, 3D LiDAR data, and multi-scale image data, to create high-precision smart city data infrastructure. By providing a range of urban sensing, urban computing, and urban analytics functions, the platform can be used to support a wide range of smart city applications, such as smart governmental policy-making, smart environmental management, smart transport optimisation, and smart citizen services.

Smart Monitoring System for Urban Tree Management
Principal Investigator: Dr Charles Wong Man-sing | Department of Land Surveying and Geo-Informatics

The system employs smart sensing technology to measure tree tilt and displacement. With AI algorithms and Spatial Big Data Analytics, it can evaluate the leaning trend of trees and potential risk factors correlated to tree failure. The system enables large-scale monitoring of tree stability, allowing timely and appropriate mitigation action to be taken. (More details on P. 23-24)

Gold Medal

A Smart All-electric Antilock Braking System
Principal Investigator: Professor Eric Cheng Ka-wai | Department of Electrical Engineering

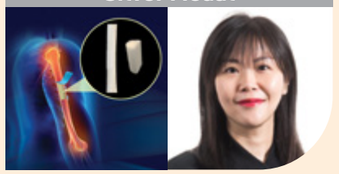
Silver Medal

The research team has developed a smart all-electric Anti-lock Braking System (ABS). The system takes into account road conditions and calculates the maximum tire-road adhesion coefficient needed in order to control the angular wheel acceleration and generate an accurate braking torque through its electric control unit. Compared with conventional hydraulic ABS, this system provides more reliable, responsive and accurate braking torque control, effectively shortening both braking time and distance.

Biomimicking Photocrosslinkable Nanocomposite Bone Graft
Principal Investigator: Dr Zhao Xin | Department of Biomedical Engineering

Under ultraviolet illumination at 36°C, this novel photocrosslinkable nanocomposite can be expeditiously fabricated into bone graft materials that resemble the natural bone structure. The material promotes bone regeneration and activates cell signaling pathways to facilitate osteogenesis and angiogenesis, both part of the healing process, simultaneously. It also provides optimal mechanical support to the injured area, accelerating recovery from bone injuries and fractures.

Silver Medal



The International Exhibition of Inventions of Geneva is one of the most important annual events in the world devoted exclusively to inventions. This year's virtual event attracted around 600 exhibitors from more than 20 countries and regions.

PolyU receives national funding to study urban air pollution in China

Professor Li Xiangdong, Dean of PolyU's Faculty of Construction and Environment and Ko Jan Ming Professor in Sustainable Urban Development, has been awarded RMB15 million to study urban air pollution in China. The funding is from the National Natural Science Foundation of China (NSFC) Major Research Plan "Toxicology and Health Effects of Airborne Fine Particulate Matter".

The research team will carry out a two-year (2021-2022) Integrated Project entitled "Joint toxicity mechanisms and contributions of key bioactive components in airborne fine particulate matters ($PM_{2.5}$) from typical urban areas of China".

Health-oriented air quality management is one of the most pressing issues facing China. The reduction of mass concentrations of $PM_{2.5}$ (fine inhalable particles with diameters of 2.5 micrometers or less) does not necessarily lead to a proportionally reduced health risk. As a result, it is important for researchers to identify the combined health effects and joint toxicity mechanisms of key bioactive components and their contribution to regional disparities in $PM_{2.5}$ toxicities.

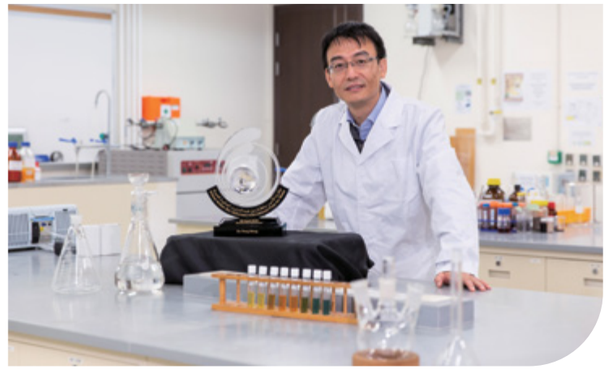
The project is a collaboration between PolyU and the Research Center for Eco-Environmental Sciences of the Chinese Academy of Sciences (Professor Qu Guangbo), Peking University (Professor Yao Maosheng) and Tongji University (Professor Yin Daqiang). The four research teams have strengths in high throughput toxicity screening, computational toxicology, microbial toxicology, and cell and animal models respectively. The teams will use advanced methods to determine which key toxic constituents and combinations are responsible for $PM_{2.5}$ -related health effects.

"This interdisciplinary research study will provide scientific evidence and technical support for the precise mitigation of high-risk bioactive components. It is essential in formulating strategies to address the low-to-medium $PM_{2.5}$ pollution issues in China," Professor Li explained.

Professor Li Xiangdong

Professor Li has previously completed a four-year (2016-2019) Key Project under the NSFC Major Research Plan. The impactful outputs of the project included a study on the toxicity of air pollution. It led to leading scientific journal *Nature* inviting the research team to contribute an article on the global disparities of air-pollution health effects. The project's study on the airborne transmission of antibiotic resistance genes was also recognised as one of the best papers in *Environmental Science and Technology Letters* in 2018. Through this project, Professor Li not only cultivated links with the three partner institutions involved in the latest collaboration, but also gained valuable experience, laying the foundation to tackle the challenge air pollution poses to public health.

PolyU scientist wins award for research to tackle water scarcity



Dr Wang received the Prince Sultan Bin Abdulaziz International Prize for Water for his work on alleviating water scarcity.

Dr Wang Peng, Associate Professor at the Department of Civil and Environmental Engineering, has won a prestigious international award for his work on promoting sustainability in the solar-energy-water nexus. Dr Wang was awarded the Prince Sultan Bin Abdulaziz International Prize for Water in the category of Alternative Water Resources. The award ceremony took place online on 22 March 2021, which was also World Water Day. President of the United Nations (UN) General Assembly Mr Volkan Bozkir and UN Secretary-General Mr António Guterres both addressed the award ceremony.

Before joining PolyU in 2019, Dr Wang spent 10 years conducting research in the Middle East. "The region's rich solar energy and lack of natural fresh water resources inspired me to focus my research on solar energy and water resources," he said. Dr Wang explained that a key theme of his work was using solar energy to produce freshwater from unconventional sources, while using accessible water to enhance the efficiency of solar electricity generation.

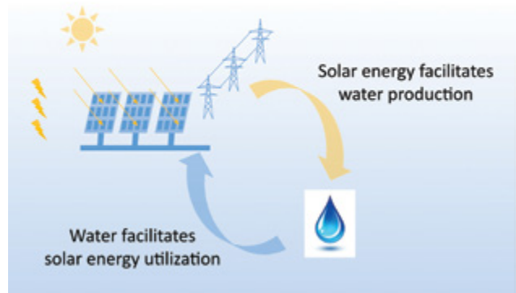
Harnessing solar energy to harvest water and vice versa

The award recognised Dr Wang's work in three key areas. The first area involved the development of an integrated solar photovoltaic (PV) panel-membrane distillation device to turn the waste heat generated by PV panels into an energy source to power water desalination. The device, which can be attached to the underside of a commercial solar cell, is capable of simultaneously cooling the PV, producing fresh water, and generating solar electricity. This represents a new paradigm of decentralised green energy and water production. Dr Wang is passionate about promoting this technology so it can contribute towards achieving the UN's Sustainable Development Goals (SDGs), especially the 6th and 7th SDGs which cover clean water as well as affordable and clean energy, by 2030.

The second area of Dr Wang's research focused on enabling energy-efficient and continuous salt crystallisation from waste brine generated by seawater desalination. The ultimate aim is to achieve zero-liquid discharge seawater desalination. "The salt crystalliser we developed produces solid salt as the only byproduct and uses sunlight as the only energy source," Dr Wang explained. "The valorisation of the produced salt is our next target."

The third area of research has included harvesting atmospheric water vapour to produce drinking water for point-of-use consumption, as well as using atmospheric water vapour sorption-desorption to cool PV panels and buildings. "The total amount of water in the air is six times greater than all river water on Earth. This makes the atmospheric water an alternative and attractive fresh water source and a giant energy source," Dr Wang said.

"There are substantial difficulties when turning these concepts into real-life usage to produce impact. However, I am glad that there is a very strong team spirit at PolyU which also offers many initiatives for the transformation of research outcomes into impactful applications," he said.



Dr Wang's research on using solar energy to produce water, and vice versa, contributes to water sustainability.

Harnessing technology to MONITOR TREE STABILITY

Urban trees offer a range of benefits from improving air quality and helping to reduce high summer temperatures, to enhancing the cityscape and bringing people closer to nature. But trees can also pose a danger to the public when they become unstable, particularly when their root systems are loosened by extreme weather events, such as typhoons and rainstorms. In 2018, more than 60,000 trees in Hong Kong were uprooted by super typhoon Mangkhut. Even after typhoons have gone, the risk of trees falling remains, as the strong winds and heavy precipitation might have loosened their roots.

The regular monitoring of trees plays an important role in maintaining public safety, but conventional visual inspections are not always effective. As a result, there is a pressing need to harness technology for large-scale monitoring of trees, enabling timely mitigation measures to safeguard the public and facilitate urban forestry management in a sustainable city.

A smart solution for large-scale tree management

To help solve the issue, a research team led by Dr Charles Wong, Associate Head (Academic) and Associate Professor, Department of Land Surveying and Geo-informatics at PolyU, has invented a Smart Monitoring System for Urban Tree Management.

Leveraging Smart Sensing Technology, the System uses wireless sensors which are attached to the lower trunks of trees. If trees have weak anchorage at their roots, it causes them to tilt. "Equipped with built-in accelerometers, the sensors measure the angles at which trees are tilting, the direction of their tilt, their sway trajectories and any unusual movements," Dr Wong said. Near-real time information from the sensors is then transmitted to a data centre at PolyU for processing and analysis.

To identify trees that may be in danger, a set of dynamic thresholds has been produced taking into account different environmental factors. If the sensor detects that the tilting angle of a tree has exceeded one of the thresholds, a message is sent to the responsible tree maintenance office. The messages have three levels: Alert, Alarm and Action. The location of the tree and data relating to its environment, such as local wind speed and precipitation, can be obtained using the Geographic Information Systems.

Smart sensors have been installed on about 8,000 trees, particularly in locations with high levels of pedestrian and vehicle traffic, such as those on pavements and slopes and in parks. The System goes beyond simply identifying which trees require a safety inspection. It also uses a set of Artificial Intelligence algorithms, developed using Spatial Big Data Analytics, to predict the leaning trend for trees. This enables tree monitoring on a massive scale and mitigation measures to be taken in advance.

Alongside monitoring the stability of trees, the System also collects data on factors that may contribute to the uprooting of trees. These factors included the impact of topography, temperature and wind, as well as human-influenced elements, such as traffic and air pollution. The data collected is being used to formulate precautionary strategies.

This PolyU-led project has received HK$32.8 million of funding from The Hong Kong Jockey Club Charities Trust, as well as support from government departments. Other collaborators in the project include The University of Hong Kong, The Hong Kong University of Science and Technology and Friends of the Earth (Hong Kong).

With sensors attached to about 8,000 trees in Hong Kong, the System leverages Smart Sensing Technology, AI, Geographic Information Systems and Spatial Big Data Analytics to monitor trees on a massive scale on a daily basis.

A holistic approach for urban forestry management

The System has significant implication for sustainable development, facilitating a holistic approach to urban forestry management. The data collected not only enables potentially hazardous trees to be detected, but it can also be used to inform the future design of urban landscapes. Understanding the correlation between environmental variables and the behaviour of urban trees forms an important part of smart city development.

In addition, the project includes a public education and engagement element through a 'Train-the-Trainer' programme, under which 100 university students attend lectures on tree management and are appointed as ambassadors. They then pass on their knowledge to around 4,000 local secondary school students.

The System has had a far-reaching influence. Recently, the project's impact was recognised with a Gold Medal at the Special Edition 2021 Inventions Geneva Evaluation Days – Virtual Event organised by the International Exhibition of Inventions of Geneva.

> The sensors measure the angles at which trees are tilting, the direction of their tilt, their sway trajectories and any unusual movements.

Dr Charles Wong (back row, third from right) and team members developed the Smart Monitoring System for Urban Tree Management.

TRANSFORMING ELDERLY CARE

with smart solutions

A native of Guangzhou, Nick Zeng Jingqiang started his own business after graduating from the Master of Science in Multimedia and Entertainment Technology programme offered by PolyU's School of Design. Nick is now the CEO of People Strong High-tech Ltd, a Shenzhen-based corporation committed to creating novel elderly healthcare solutions. His remarkable career success has earned him numerous accolades. He was recently honoured in the Hurun China "Under 30s To Watch 2020" list that recognises elite entrepreneurs aged 30 or under in China, and he was also recognised in the Forbes China "30 Under 30" 2019 list.

Nick's entrepreneurial spirit was sparked off during his studies at PolyU. By harnessing the knowledge of emerging technologies and the entrepreneurial skillset learnt from the University, Nick and three of his classmates developed a smart pill box which achieved second place in a national innovation competition in 2013. "The inspiration for the pill box came from my grandmother who needs to take medicines regularly," Nick explained. "I hoped the invention could help her and other elderly people who suffer from chronic diseases to take the right medications on time."

In 2014, Nick received funding from the STEFG-PolyU China Entrepreneurship Fund Scheme to found his start-up company People Strong High-tech Ltd. The Scheme was the first China-Hong Kong cross-border matching fund for PolyU graduates to start new businesses in Shenzhen and Shanghai.

Weathering the ups and downs of business

Being an entrepreneur means weathering the ups and downs of business and Nick encountered different challenges ever since the prototype phase of the smart pill box. Back then, he had to look for manufacturers in Shenzhen with only design drawings on hand. As the production quantity was small, no big manufacturers would accept his order. He only managed to find a tiny manufacturing plant to produce the prototypes after a lengthy search.

Mr Nick Zeng Jingqiang

- Double Degree Programme in Advertising Design and Logistics Management, Shenzhen University (2012)
- MSc in Multimedia and Entertainment Technology, PolyU (2013)
- CEO, People Strong High-tech Ltd
- Hurun China "Under 30s To Watch 2020" list
- Forbes China "30 Under 30" 2019 list

This award-winning smart pill box Nick and his team invented is a medicine reminder with petal-shaped containers for pills. It has an alarm and a glowing function, as well as an emergency help button with Global Positioning System linking to caregivers.

When Nick later wanted to mass-produce the smart pill box, he knew nothing about production and had not built a manufacturing network. A manufacturer offered to invest RMB100,000 and cover the whole production process with one condition: the smart pill box had to bear the company's brand and logo. "Fortunately, I did not conclude the deal in the end," Nick recalled. "I only realised afterwards that I had almost lost the proprietary product to the manufacturer."

It was not until Nick met his first angel investor at a roadshow that he could finally build up his team of staff. He kept upgrading the smart pill box and gradually developed it into a smart system for care homes. The system can collect data from the users of various elderly healthcare devices and generate a big data database. Nick's company can then use the information to help optimise the administration and management efficiency of care homes. The data also helps his company design innovative elderly healthcare solutions for care homes.

From start-up to scaleup

Since then, Nick has managed to scale up People Strong which has grown into an enterprise offering diversified elderly healthcare products and services. The company's smart watches, for example, can check the blood oxygen levels, blood pressure and heart rates of the chronically ill elderly with an emergency call function. Another model of the watches, targeted at elderly people with dementia, helps connect with their emergency contacts with a QR code when the elderly get lost. With a clientele of over 70 care homes in Mainland China, the company has served more than 90,000 elderly people. The growing application of their products and services has also helped cut down medication wastage amounting to RMB 40 million annually. Some of the products have received certifications from the U.S. Food and Drug Administration, and the company has many national awards and several patents under its belt.

Moreover, People Strong has partnered with PolyU, Shenzhen University and Guangdong Polytechnic College to establish work-integrated programmes to train students in the company's office in Shenzhen. It has also collaborated with Shenzhen Kangning Hospital and Shaanxi Provincial Hospital of Traditional Chinese Medicine to establish new standards for smart operations in the senior care industry.

Transforming the senior care industry

In view of the COVID-19 pandemic, Nick's company has created a comprehensive system that can perform face detection and body temperature checks at the dining area of care homes. The system enables caregivers to better take care of the elderly, analyse elderly dining practices and manage care home facilities more effectively. Over 60 care homes have already adopted the system.

Nick sees it as his mission to transform the senior care industry. "I hope that the success of my company will motivate more young entrepreneurs to participate in invigorating and enriching the lives of the elderly."

Nick with his grandmother, who was his inspiration for designing the smart pill box.

PolyU has most top 50 ranked scientists in HK according to Stanford citation ranking

The world-class research produced by PolyU scholars across a wide range of disciplines has been recognised in different global rankings. More than 160 scholars from PolyU have been ranked among the world's top 2% most-cited scientists, according to an index compiled by Stanford University. PolyU has 20 scientists who are ranked among the top 50 scholars in the world in their respective fields, the highest number among universities in Hong Kong. PolyU also has the most top 10 and top 20 scholars in their respective fields among local universities.

Overall, PolyU has the second highest number of scientists included on the list among Hong Kong universities, while it also has the most top 2% scientists in Hong Kong in the fields of Building and Construction (15) and Civil Engineering (12).

The scholars were named in the "Updated science-wide author databases of standardised citation indicators" compiled by Stanford University. A research team, led by Professor John Ioannidis, created the database of more than 100,000 top scientists across the world on the basis of standardised citation indicators. They were grouped into 22 subject fields and 176 sub-fields using the indicators. The indicators included information on citations, an individual's scientific research output, co-authorship and a composite indicator for career-long citation impact up to the end of 2019.

In addition, 12 PolyU scholars have also been included in the Highly Cited Researchers 2020 list compiled by Clarivate.

These recognitions reflect the significant influence and research excellence of the University's scientists, who are committed to furthering their knowledge for the benefit of the world.

Congratulations to the following PolyU scholars who have been ranked among the top 50 scientists in the world in their respective fields:

Subject field
Rank in field (field size)

Operations Research
5 (23,455)
Ir Professor Edwin Cheng
Chair Professor of Management, Department of Logistics and Maritime Studies

Building & Construction
5 (27,014)
Professor Poon Chi-sun
Chair Professor of Sustainable Construction Materials, Department of Civil and Environmental Engineering

Operations Research
10 (23,455)
Professor Felix Chan
Professor, Department of Industrial and Systems Engineering

Sport, Leisure & Tourism
5 (6,302)
Professor Rob Law
Professor, School of Hotel and Tourism Management

Civil Engineering
8 (42,054)
Professor Jin-Guang Teng
Chair Professor of Structural Engineering, Department of Civil and Environmental Engineering

Sport, Leisure & Tourism
11 (6,302)
Professor Bob McKercher
Professor, School of Hotel and Tourism Management

Chemical Engineering
15 (55,697)
Professor Chen Guohua
Chair Professor of Energy Conversion and Storage, Department of Mechanical Engineering

Environmental Engineering
16 (42,482)
Professor Chau Kwok-wing
Professor, Department of Civil and Environmental Engineering

Operations Research
16 (23,455)
Professor Qi Liqun
Emeritus Professor of Applied Mathematics, Department of Applied Mathematics

Information Systems
21 (16,581)
Professor Eric Ngai
Professor, Department of Management and Marketing

Strategic, Defence & Security Studies
22 (17,157)
Professor Chow Wan-ki
Emeritus Professor (Architectural Science and Fire Engineering), Department of Building Services Engineering

Accounting
22 (4,675)
Professor James Ohlson
Visiting Chair Professor of Accounting, School of Accounting and Finance

Building & Construction
22 (27,014)
Professor Wang Shengwei
Chair Professor of Building Services Engineering, Department of Building Services Engineering

Inorganic & Nuclear Chemistry
25 (57,598)
Professor Wong Wai-yeung
Chair Professor of Chemical Technology, Department of Applied Biology and Chemical Technology

Civil Engineering
27 (42,054)
Professor Xu You-lin
Emeritus Professor (Structural Engineering), Department of Civil and Environmental Engineering

Building & Construction
28 (27,014)
Professor Albert Chan
Chair Professor of Construction Engineering and Management, Department of Building and Real Estate

Building & Construction
30 (27,014)
Professor Li Heng
Chair Professor of Construction Informatics, Department of Building and Real Estate

Civil Engineering
43 (42,054)
Professor Ben Young
Professor, Department of Civil and Environmental Engineering

Sport, Leisure & Tourism
48 (6,302)
Professor Cathy Hsu
Chair Professor of Hospitality and Tourism Marketing, School of Hotel and Tourism Management

Sport, Leisure & Tourism
50 (6,302)
Professor Song Haiyan
Chair Professor of Tourism, School of Hotel and Tourism Management

PolyU recognised in world university subject rankings

The University has achieved commendable results in the QS World University Rankings by Subject 2021, with five disciplines ranked among the top 50 in the world. Hospitality and Leisure Management led the way, ranked in ninth place, followed by Architecture/Built Environment (18th), Art and Design (20th), Civil and Structural Engineering (21st) and Nursing (43rd).

This year's rankings analysed nearly 14,000 programmes, covering 51 disciplines, from 1,440 universities around the world. The results testify to PolyU's academic excellence as a world leader in a number of disciplines. The University will continue to elevate its academic reputation through top-quality education, high-impact research and innovation, contributing to the betterment of society, our Nation and the world.

QS World University Rankings by Subject 2021

Hospitality and Leisure Management	9th
Architecture/Built Environment	18th
Art and Design	20th
Civil and Structural Engineering	21st
Nursing	43rd

PolyU 25th and 26th Congregation

The University held the Doctor of Philosophy and Faculty/School Sessions of the 26th Congregation, and the 25th Congregation Make-up Sessions for the Faculty of Business and the Faculty of Construction and Environment in March. Presided over by Council Chairman Dr Lam Tai-fai, the ceremony was held online, in light of the COVID-19 pandemic.

For 2019/20, PolyU graduated 9,432 students, including 390 doctoral recipients, 4,070 master's degree or postgraduate diploma recipients, as well as 4,672 bachelor's degree and 300 sub-degree students.

At the Congregation, PolyU President Jin-Guang Teng extended his appreciation to the graduates for their hard work, dedication and resilience while overcoming various difficulties in pursuing their studies during the COVID-19 pandemic. He encouraged all graduates to set well-defined goals so as to give their life a meaningful direction. He further urged them not to forget their social responsibilities and to contribute to the progress of society and the development of the Nation.

Professor Teng also told graduates, "Please take on the current challenges, embrace any opportunity you encounter and glow with brilliance in a world full of uncertainties."

Educators explore new priorities at USR summit

As a founding member of the University Social Responsibility Network (USRN), PolyU has been working with 15 other member institutions around the world to advocate university social responsibility since the network was established in 2015. The USRN's biennial flagship event, the USR Summit, brings together leaders from the higher education sector to exchange ideas and foster partnerships among universities, generating positive social impacts and driving the sustainable development of the world.

The USR Summit 2021 was hosted online by the University of Pretoria in South Africa earlier this year, under the theme "University Social Responsibility: Priorities for the Next Decade". Professor Tawana Kupe, Vice-Chancellor and Principal of the University of Pretoria, and Dr Miranda Lou, Executive Vice President of PolyU and Co-Chair of the Executive Committee of the USRN, officiated at the opening of the Summit.

Professor Tawana Kupe

USR amid global crisis

Professor Kupe welcomed the guests from all over the world saying, "The past year was proved to be one of the most challenging years in modern times. Now more than ever it has become important for us to care for and look after one another."

Addressing participants, Dr Lou said the pandemic had reminded the higher education sector to reflect on the essence of university social responsibility when the world was in crisis, people were vulnerable, and the educational model was under tremendous pressure.

"Let us seize the opportunities amid the current crisis to further advocate for broader social responsibility in higher education; find solutions to make our communities more just, inclusive, peaceful and sustainable; and co-create a world we and the next generation deserve," Dr Lou said.

Dr Miranda Lou

More than 150 academics, students and practitioners from 27 institutions and 14 countries participated in the Summit. They discussed the way forward for USR from different perspectives, including the aftermath of the COVID-19 pandemic, institutional governance, the role of students and inter-sectoral collaboration in promoting the Network.

Among the speakers were Professor Angelina Yuen, Honorary Professor of PolyU's Department of Applied Social Sciences; Professor Chris Brink, Emeritus Vice Chancellor of Newcastle University in the UK; Professor Joy Johnson, President and Vice Chancellor of Simon Fraser University in Canada; and Mr Duncan Ross, Chief Data Officer of Times Higher Education.

Professor Yuen spoke about the transformative power of higher education in fostering global connectedness and solidarity in the aftermath of the COVID-19 pandemic. Other speakers talked about the changing mission of higher education, and universities as leaders in realising the sustainable development goals. Other topics included delivering transitional social housing through social innovation, and tackling the issue of ageing societies through applied research and social capital development.

PolyU Artist-in-Residence: LEGENDARY PERFORMER DR LIZA WANG

PolyU has run an Artist-in-Residence Programme since 1999, reflecting the integral role art and culture plays in a holistic education. For the year 2020-21, PolyU is honoured to have Dr Liza Wang Ming-chun, University Fellow and a highly respected, multi-talented performing artist, as its Artist-in-Residence. Dr Wang is sharing her rich knowledge of Cantonese opera and her passion for the art with the University community.

Affectionately known as "Liza Jei", Dr Wang has enjoyed a long and versatile career. She has been a household name among Hong Kong, Mainland and overseas Chinese audiences since the 1970s. But it was not until she was 40 that Dr Wang began exploring her passion for Cantonese opera. "I am devoted to Cantonese opera because of its beauty, uniqueness and richness in substance," Dr Wang said.

PolyU conferred University Fellowship on Dr Wang in 2018.

Over the past three decades, Dr Wang has been dedicated to promoting this centuries-old Chinese art, paving the way for a new generation of Cantonese opera performers and audiences. In 1988, she established the Boomabliss Cantonese Opera Troupe (福陞粵劇團) with Dr Law Ka-ying, which incorporated new elements and diversification into the art form.

Dr Wang has chaired the Chinese Artists Association of Hong Kong (Barwo 香港八和會館) for two decades. She played an important role in the transformation of the historic Yau Ma Tei Theatre into a training centre for young artists. She also made a significant contribution in the establishment of the new Xiqu Centre in the West Kowloon Cultural District to promote Cantonese opera to the public. In 2020, Dr Wang launched the Barwo Channel, producing 40 episodes on Cantonese opera to serve as an appreciation guide for people interested in learning about the art form. "I want to make Cantonese opera flourish. I want to see it live on," she said.

Cantonese opera was recognised as the world's Intangible Cultural Heritage by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2009. It was also the first recognition of its kind by UNESCO for Hong Kong.

Dr Wang is keen on passing on her knowledge to the next generation. Together with her colleagues from Barwo, she held an interactive session for PolyU students, introducing them to the four basic elements of Cantonese opera: singing, acting, reciting and combat. She also taught students some of the fundamental performance techniques to give them a flavour of the Chinese art.

As part of the Artist-in-Residence Programme, an exhibition titled "Cantonese Opera: Beyond Tradition" was held on campus to showcase Dr Wang's contribution to bringing fresh perspectives to the development of this ancient art. It showed how Dr Wang had extended the reach of Cantonese opera through changing its performance representation and adding contemporary touches, while still preserving its traditional beauty.

Dr Wang likes to share her experience with young people. In March this year, she hosted a talk for the PolyU community in which she spoke about the attributes she thinks have contributed to her success, namely self-respect, self-motivation and self-confidence. "Recognise your weaknesses and proactively grasp opportunities to strengthen yourself. Take the time to plan your life. Trust yourself and live with enthusiasm," she said. A role model for lifelong learning, Dr Wang is eager to acquire new knowledge and believes there is always more to discover.

Artist-in-Residence Programme
Launched in 1999, this annual Programme enriches the artistic and cultural lives of members of the PolyU community by providing opportunities to interact with masters of different artistic disciplines. Over the years, our Artists-in-Residence have included conductors, musicians, theatre directors, film producers and more. Programme activities range from interactive events, performances and exhibitions to workshops and talks.

Dr Wang shares her knowledge of Cantonese opera with students and teaches them some performance techniques.

PRESIDENT'S AWARDS FOR OUTSTANDING ACHIEVEMENT

PolyU recognises the distinguished accomplishments and contributions of staff members through the President's Awards for Outstanding Achievement. Categorised into individual and team awards, the accolades are given in the areas of teaching, research and scholarly activities, and services. For the year 2019/20, the awardees are:

Individual Awards – Teaching
- Dr Shirley Ngai, Associate Professor, Department of Rehabilitation Sciences
- Dr Fridolin Ting, Teaching Fellow, Department of Applied Mathematics

Individual Awards – Research and Scholarly Activities
- Dr Chai Yang, Associate Professor, Department of Applied Physics
- Professor Jin Wei, Chair Professor of Photonic Instrumentation, Department of Electrical Engineering

Team Awards – Services (Non-academic staff)
- University Research Facility in 3D Printing and Industrial Centre
- Facilities Management Office

Congratulations to all the award recipients! The awards are fitting recognitions of their dedication and professionalism, which exemplify the PolyU spirit.

Teaching

Dr Shirley Ngai - Growing step by step with students

Dr Shirley Ngai is keen to explore and develop new teaching methods and enrich curricula to address physiotherapy students' needs and enhance their learning experience. The innovative learner-centred pedagogies she has adopted include providing onsite support to students in clinical placements through a mobile app, using interactive games in class, developing online faculty-led and student-led learning modules, and setting up a Massive Open Online Course entitled "Interdisciplinary management in cardiopulmonary health and disease".

Most notably, she has incorporated the Computerised Medical Simulation Flipped Classroom into the teaching of cardiopulmonary physiotherapy. It enables students to apply their knowledge to analyse the changing conditions of simulated patients and make on-the-spot decisions, bridging the gap between classroom learning and real clinical practice.

Dr Shirley Ngai, who won a 2018 National Teaching Achievement Award, developed innovative pedagogical methods for teaching physiotherapy, such as using computerised medical simulations.

Currently, Dr Ngai is working on a funded project to develop online resources and guiding principles for clinical educators, who devise clinical training and conduct skill assessments for physiotherapy students, to ensure fair and consistent assessments for students.

Dr Ngai also observed that physiotherapy students tended to focus on acquiring professional knowledge and competency but often overlooked the importance of developing soft skills. To fill this gap, she developed the student-led professional competency case reasoning modules to enhance their communication skills, and a cultural competency module to prepare them to work with healthcare professionals, patients and caregivers from different cultures.

Living by the motto "growing step by step with students", Dr Ngai said: "I hope to accompany my students in their learning journeys, addressing their needs, standing by them and growing with them."

She has received multiple awards, including the 2016 UGC Teaching Award (Early Career Faculty Member) from the University Grants Committee (UGC) and the 2018 National Teaching Achievement Award (Higher Education) (Second Class Prize) from the Ministry of Education of China.

"I am grateful to PolyU, the Department of Rehabilitation Sciences, colleagues and students for their trust and support in my efforts to explore new pedagogies," Dr Ngai said.

> I hope to accompany my students in their learning journeys, addressing their needs, standing by them and growing with them.

Dr Fridolin Ting - Fostering engagement and enjoyment in learning

Dr Fridolin Ting is committed to advancing STEM (science, technology, engineering and mathematics) education by providing an environment in which students are engaged and enjoy learning. He uses evidence-based, active learning pedagogies supported by mobile applications to create this environment.

> I am truly humbled, honoured and grateful to have received the President's Award, which would not have been possible without the support of PolyU's senior administrators and my colleagues.

Dr Ting led a PolyU team, in collaboration with Hong Kong Baptist University, the Chinese University of Hong Kong and the University of Hong Kong, to pursue a project on "Developing Active Learning Pedagogies and Mobile Applications in University STEM Education (PALMS)". Funded by UGC and involving more than 40 academics, PALMS developed a range of active teaching methods and corresponding mobile solutions.

As part of the project, Dr Ting led a team to create YoTeach!, a web-based chat platform enabling students

Dr Fridolin Ting developed mobile applications to create an engaging learning environment for students.

to ask questions or make comments during lectures; and Badaboom!, a student response system with game elements. He also led a team to create Cell Game, an online multiplayer competitive survival game offering learning through entertainment; and Collaborative Problem-Based Learning and Peer Assessment using interactive online whiteboards.

Best practices in active learning developed by PALMS have been applied by about 700 universities, schools and corporations in 280 cities in more than 70 countries. The team has won 10 international awards, including the Gold Award of Exemplary Teaching and Learning Award presented by eLearning Forum Asia in 2020, and the Silver Award in the category of Natural Sciences Discipline Awards at the Wharton-QS Reimagine Education Awards in London in 2019.

Dr Ting said, "It has been both a humbling and an adventurous road on which our PALMS team has travelled, resulting in recognition by these prestigious international awards." He added that it is the team's goal to improve students' learning through active teaching methods supported by technology.

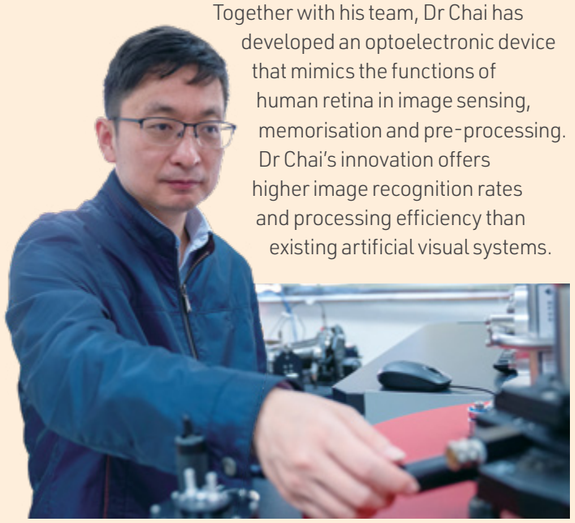
Among his achievements, Dr Ting won the "Best Teacher Award" in the Department of Applied Mathematics in 2014, received the Silver Award in EdTech Leader in Asia (Tertiary Category) at the EduTech Asia Awards in 2019, and was named the winner of "School Leader Setting a Trend" by EdTech Digest in 2020.

Research and Scholarly Activities

Dr Chai Yang – Delving into low-dimensional material research

Dr Chai Yang's research focuses on low-dimensional materials for electronic and energy devices. A low-dimensional material has at least one of its dimensions on the nanoscale, displaying unexpected and sometimes extraordinary electronic, optical, thermal, mechanical and chemical properties. Recent advances in this research field have paved the way for revolutionary applications in electronics, photonics, biomedical, aviation, pollution control, and other areas.

Together with his team, Dr Chai has developed an optoelectronic device that mimics the functions of human retina in image sensing, memorisation and pre-processing. Dr Chai's innovation offers higher image recognition rates and processing efficiency than existing artificial visual systems.



Dr Chai Yang's research focus is on low-dimensional materials for electronic and energy devices.

> I am honoured and humbled to receive the PolyU President's Award. I am immensely grateful to all my colleagues, group members and collaborators, and hope to make further progress in research.

It has great potential to be used in a neuromorphic visual system to enhance the efficient processing of high volumes of dynamic visual information.

A research paper on the device was published in *Nature Nanotechnology* in 2019. Dr Chai, who joined PolyU in 2012, has published around 100 papers in academic journals including *Nature Electronics*, *Nature Communications*, *Science Advances*, and *Advanced Materials*, attracting significant attention from the scientific community. Some of his papers have been highly-cited and were highlighted in the media.

Dr Chai has also secured a total of HK$6.38 million of external research funding, including from the Germany/Hong Kong Joint Research Scheme facilitated by the Research Grants Council, the National Natural Science Foundation of China, and the China Electronic Technology Corporation.

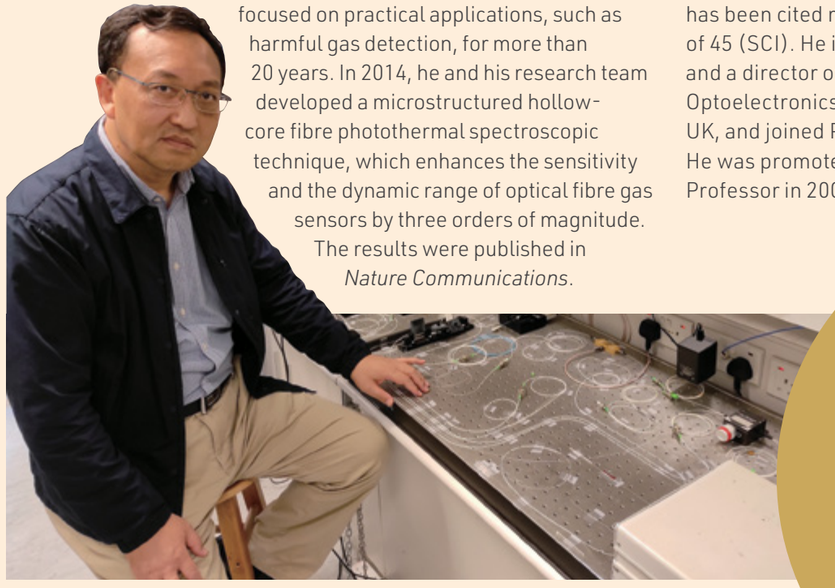
He has been an active Distinguished Lecturer for the Electron Devices Society of the Institute of Electrical and Electronics Engineers (IEEE) since 2016. He is currently Vice President of the Physical Society of Hong Kong, as well as the chair of the IEEE Hong Kong Joint Chapter of Electron Devices and Solid-State Circuits. He also has extensive experience serving as a guest editor and reviewer for highly-regarded journals and as chair or co-chair at international conferences.

Dr Chai studied at Stanford University and the University of Illinois at Urbana-Champaign before he joined PolyU as Assistant Professor in 2012. He was promoted to Associate Professor in 2018.

Professor Jin Wei – Leading fibre-optic gas sensing research

Professor Jin Wei has a wide range of research interests, including photonic crystal fibre devices, optical fibre sensors, fibre lasers and amplifiers, and optical gas detectors, as well as monitoring electrical power transformers, and civil and mechanical structures.

A pioneer and authority in microstructured optical fibre gas sensing, Professor Jin's research has focused on practical applications, such as harmful gas detection, for more than 20 years. In 2014, he and his research team developed a microstructured hollow-core fibre photothermal spectroscopic technique, which enhances the sensitivity and the dynamic range of optical fibre gas sensors by three orders of magnitude. The results were published in *Nature Communications*.



Professor Jin Wei is an expert in microstructured optical fibre gas sensing.

Recently, Professor Jin and his research team have developed an even more advanced technique, namely Mode-phase-difference Photothermal Spectroscopy, which significantly outperforms state-of-the-art electrochemical and semiconductor gas sensors. His impressive work was published in *Nature Communications* with a review commending his method as being "a landmark technique in fibre-optic gas sensing". The novel technique was selected by the Chinese Laser Press, Optical Society of China (OSC) as one of the 2020 China's Top 10 Optical Breakthroughs. His work enables multi-component gas detection with a single sensing element and paves the way for ultra-precision gas sensing for various applications. His two recent projects are related to applications for harmful gas monitoring in space stations and breath analysis for medical diagnosis.

For his optical sensor research, Professor Jin has secured total funding of more than HK$50 million. He has received much recognition for his research achievements, including a Distinguished Young Scholar Award (Category B) from the National Science Foundation of China in 2006, a Chang Jiang Chair Professorship from the Ministry of Education of China in 2009, and the 2018 Shenzhen Science and Technology Awards - Natural Science (First Class Prize).

Professor Jin has authored or co-authored two books, 10 book chapters and 300 journal papers, among many other scholarly publications. His work has been cited more than 7,000 times with an h-index of 45 (SCI). He is a fellow of The Optical Society and a director of the OSC. He received his PhD in Optoelectronics from the University of Strathclyde, UK, and joined PolyU as Assistant Professor in 1996. He was promoted to Associate Professor in 1998 and Professor in 2003.

> Careful observation plus some imagination and reasoning can bring you closer to the truth.

The U3DP and IC team, under the leadership of Professor H. C. Man (back row, middle), quickly designed and produced eye visors and face shields to help the community combat COVID-19.

Services

Speedy development of 3D printed eye visors and face shields to meet urgent needs during the pandemic

Soon after the coronavirus was first confirmed to have spread to Hong Kong, the Queen Elizabeth Hospital (QEH) and the Hospital Authority (HA) approached PolyU to explore solutions for the serious shortage of eye visors and face shields for frontline medical staff.

In view of the urgency, PolyU's University Research Facility in 3D Printing (U3DP), Hong Kong's largest research centre in 3D printing in terms of the range and quantity of facilities, and Industrial Centre (IC) immediately joined hands to take on the challenge. In just 10 days, they fabricated 500 reusable eye visor frames, and 200 single-use frames for QEH, using a highly resistant material.

At the same time, Professor H. C. Man, Cheng Yick-chi Chair Professor in Manufacturing Engineering, Dean of Faculty of Engineering and Director of U3DP, swiftly put together a team to design a face shield. Ir Sidney Wong, Engineering Manager (IC Additive Manufacturing Stream), coordinated the work between U3DP and IC, while Mr Tab Cheng, Senior Engineer at U3DP, took the lead in the design work. The team took six days to finalise the design after six iterations. The design leveraged PolyU School of Design's study in the head sizes of Asians to design a face shield that would better fit Chinese wearers.

Making use of all of the 3D printers on campus, the team worked round the clock for 11 days to produce more than 1,800 face shields, providing enough for not only the HA, but also the Fire Services Department and the Government Logistics Department. By the end of February, a local manufacturer was engaged for the mass production of the PolyU face shield, ensuring the HA had a daily supply of 10,000 pieces, which rose to 30,000 by the end of March.

In preparation for the long battle against COVID-19, the team also designed and produced two types of low-cost reusable face shields, namely "General Use Face Shield" and "Extra Protection Face Shield", for the PolyU community, non-profit organisations and the public. With the support of a local manufacturer, free samples were distributed to different NGOs, including Po Leung Kuk, Helping Hand, and St James's Settlement. The team's work also led to enquiries from 12 overseas parties seeking technical advice and production assistance.

The U3DP & IC team

From U3DP

Ir Professor H. C. Man (team leader)	Director of U3DP
Mr Tab K. F. Cheng	Senior Engineer
Mr Ngai Chi-hang	Senior Engineer
Dr Zhang Yifan	Engineer
Dr Esther Ma	Associate Engineer
Mr Freddy Yuen Chun-fai	Assistant Engineer

From IC

Ms Cheng Ka-po	Senior Engineering Manager
Ir Dr C. C. Cheung	Senior Engineering Manager
Ir Sidney Wong Wing-fai	Engineering Manager
Mr Ho Kin-man	Associate Engineer
Mr Paddy Cheong Kung-pan	Assistant Engineer

Joining hands to restore the campus

The University campus was severely affected as a result of the social incidents in November 2019. In response, the Facilities Management Office (FMO) set up a recovery team to offer dedicated support to the University Crisis Response Team and take on the challenges of large-scale restoration work.

Once the incident was peacefully resolved, the FMO recovery team collaborated with the Campus Development Office and the Health, Safety and Environment Office to carry out recovery works. After conducting a campus safety assessment, the team set well-defined targets and came up with various solutions to help restore the campus in an efficient manner.

Embracing the spirit of HOPE (which stands for Heart, One team, Professionalism, and Excellence), the team facilitated the re-opening of the campus by phases, with most campus operations able to resume as normal before mid-January 2020.

The FMO team

Mr Kent Yau (team leader)	Associate Director of Facilities Management
Mr Thomas Tam Chun-man	Associate Director of Facilities Management
Mr Keith Chan	Senior Facilities Manager
Mr T. C. Chik	Senior Facilities Manager
Ms Bonnie Hung Chui-shan	Senior Facilities Manager
Mr Jeffrey C. T. Wong	Senior Facilities Manager
Ms Vivien S. K. Lau	Senior Administrative Manager
Mr Jacky Chau Chun-keung	Manager
Ms Ada Chan	Facilities Manager
Mr Lawrence Cheung	Facilities Manager
Miss Kwan Man-yee	Facilities Manager
Ms Jan Kwok Ka-man	Facilities Manager
Mr Frankie Yee Chiu-mun	Facilities Manager

The recovery team from FMO and Director of Facilities Management Mr Lawrence Lau (seventh from left) embrace the spirit of HOPE while offering their services.

■ *(From left) Ir Dr Derrick Pang Yat-bond, Dr Thomas So Shiu-tsung and Dr Daniel Yip Chung-yin*

Welcome to new PolyU Council members

PolyU extends a warm welcome to three lay members to the University Council for a three-year term of service, with effect from 1 April 2021. They are (in alphabetical order of surname):

Ir Dr Derrick Pang Yat-bond, Chief Executive Officer of Asia Allied Infrastructure Holdings Limited, who has more than 20 years of geotechnical design and construction experience in the US and Hong Kong. Dr Pang has served in various public offices and is actively involved in charitable work, including setting up "Lifewire" to help children with rare diseases and their families.

Dr Thomas So Shiu-tsung, Partner of Mayor Brown, who is on a number of panels of arbitrators in Asia, and a solicitor-advocate with rights to appear in the higher courts in Hong Kong. Dr So is also a PRC qualified lawyer and a China-Appointed Attesting Officer. He was former President of the Law Society of Hong Kong.

Dr Daniel Yip Chung-yin, Managing Director of G.E.W. International Corporation Limited, who has over 30 years of experience in the electrical appliances manufacturing industry. Dr Yip actively takes part in public and community services. He is Chairman of the Federation of Hong Kong Industries and was a recipient of the Young Industrialist Award of Hong Kong in 1999.

Alongside these new appointments, Ms Karen Chan Ka-yin and the Hon. Jimmy Ng Wing-ka have been re-appointed as members of the Council for a further term of three years.

The University also expresses its gratitude to Mr Stephen Liu Ling-hong, Mr Peter Sit Kien-ping and Mr Jaime Sze Wine-him, who have completed their terms and retired from the Council.

University Fellow recognised with esteemed accolade

Congratulations to Professor Norman W. M. Ko, University Fellow of PolyU, on being honoured with the HKIE Gold Medal 2021 by The Hong Kong Institution of Engineers (HKIE)! The prestigious award is a fitting recognition of his outstanding achievements and contributions over the decades to advancing the science of fluid dynamics and acoustics, as well as the control of noise pollution in Hong Kong.

Professor Ko is not only an eminent professor of mechanical engineering, but also a multi-talented artist enjoying global recognition for his creative works in sculpting, painting and photography. PolyU is fortunate to be home to some of Professor Ko's sculptures, which embody his good wishes for the University.

Senior staff appointments and promotions
(between 1 January and 31 March 2021)

Congratulations to the following PolyU members who have recently taken up a new capacity at the University. (listed in alphabetical order)

Appointments

Professor Chen Changwen
as Chair Professor of Visual Computing, Department of Computing
on 30 March 2021

Professor Chen Wu
as Head, Department of Land Surveying and Geo-Informatics on 1 February 2021

Professor Fu Xiaowen
as Associate Dean (External Engagement), Faculty of Engineering on 18 February 2021

Professor Li Ping
as Associate Director of University Research Facility in Behavioral and Systems Neuroscience
on 18 March 2021

Professor Li Xiangdong
as Dean, Faculty of Construction and Environment on 1 January 2021

Dr Sean McMinn
as Director of English Language Centre
on 11 January 2021

Professor Marco Pang
as Director of University Research Facility in Behavioral and Systems Neuroscience
on 18 March 2021

Promotion

Ms Jiang Ying
as Director of Institutional Research and Planning on 1 March 2021

TRANSFORMING WITH TECHNOLOGY

How a technology leader sees changes in the post-pandemic world

Mr Horace Chow Chok-kee

- Diploma in Computing Studies, Hong Kong Polytechnic (1985)
- Bachelor of Science in Computer Science, University of Portsmouth, the UK (1989)
- Chief Operating Officer, Microsoft China
- Recipient of Distinguished Alumni Award, Department of Computing, PolyU (2014)
- Chairman, Departmental Advisory Committee, Department of Computing, PolyU (2015 - 2020)

From an anxious student who did not know how to log on to a computer, to a veteran of a tech giant, Mr Horace Chow Chok-kee, Chief Operating Officer of Microsoft China, has undergone a dramatic transformation since he first joined Hong Kong Polytechnic (a predecessor of PolyU) more than 30 years ago.

For decades, technology has not only shaped Horace, but it has also revolutionised enterprises and changed the daily lives of people across the world. Today, Horace helps his clients get to grips with these changes, guiding them through their digital transformation journeys, and acting as a bridge between technology and ordinary people.

From novice to expert

Before entering the Polytechnic in the 1980s, Horace did not know anything about computers. "My elder brothers filled out the application form for me, choosing mechanical engineering programmes. I was disobedient. I crossed out their choices and ticked computing studies instead - a subject I knew nothing about," he remembers. "In the admission test, I was only able to answer questions on language and mathematics, and I left all those relating to computers empty," he says. Surprisingly, Horace's application was successful.

While his classmates appeared knowledgeable about computers, Horace outshone many of them with his excellent communication and coordination skills. In his second year of the computing studies programme, he managed to master programming skills, gradually developing his interest in the information technology (IT) field.

"I feel so blessed to have entered the Polytechnic," Horace says. "I am always fascinated by PolyU's signature red brick architecture and beautiful library. It is a landmark in the city. I like the campus which is open and cosy."

Horace's curiosity to experience life outside of Hong Kong motivated him to pursue further studies in the UK after graduating from the diploma programme. A few years later, he obtained his bachelor's degree from the University of Portsmouth.

His ability to take on any challenge, anywhere has enabled him to develop a global perspective. Over the past 20 years, he has worked in a number of different countries, such as Japan, Korea, Australia, Singapore, Thailand, the Philippines and India, to name a few. In 2017, his global exposure was further increased when he was appointed Chief Operating Officer of Microsoft China. Since then, he has been based in Beijing, playing a pivotal role in guiding customers and partners in Mainland China through their digital transformation journeys.

Transformation in enterprises

Horace's experience of different countries has left him well adapted to operating in diverse cultures and unexpected working environment. He thinks the COVID-19 pandemic has illustrated the importance of adaptability to everyone. "The pandemic changed the way we work and accelerated digital transformation," Horace says. "For instance, when commuting was considered risky and remote working practices became the 'new normal', most of us relied on videoconferencing technologies."

As an advocate of technology, Horace expects remote working arrangements, supported by technology, to remain even once the pandemic has subsided. "Nowadays, nobody can say they do not need technology. Technology is everywhere. Companies see the benefits. The use of technology facilitates innovation, saves time, minimises business travel, and significantly reduces costs. Digital transformation has become a trend in every industry," Horace explains.

In the post-pandemic era, he expects the workplace transformation to continue. "While employers may not meet their staff in person, they will need lots of trust. We will also need to have more one-to-one quality communications with each other, offering a personal touch to complement the remote working model that keeps people apart," he says.

Horace believes being open-minded, having an appreciative attitude and being collaborative are all key attributes to successfully coping with changing working practices.

Technology transforms the world

With digital transformation spanning across every industry and profession, IT professionals play a key role in bridging the gaps between technology and ordinary people. Horace actively encourages IT students to take on this role in the tech-driven world. In 2015, when he was the General Manager of Microsoft Hong Kong, he contributed to his alma mater by setting up the PolyU-Microsoft Smart Computing Laboratory, which provides students with opportunities to integrate their knowledge into practical work. He is also the former Chairman of the Departmental Advisory Committee of the Department of Computing (COMP). His outstanding achievements in career and significant contributions to PolyU were recognised with a COMP Distinguished Alumni Award in 2014.

Currently based in Beijing, Horace plays a leading role in the management of Microsoft China's business.

When asked what advice he would give to young graduates, Horace says: "Think global. Know more about what is happening in the world. Be open. Be appreciative. Seek diversified knowledge in areas other than just your own profession. Put your trust in teamwork. When your team shines, so do you."

Horace (front row, fourth from right), a recipient of COMP Distinguished Alumni Award, often visits PolyU and contributes to the University with his expertise.

BRAVO TO OUR OUTSTANDING STUDENTS!

PolyU organises the Outstanding Students Award Scheme annually to award full-time final-year students who excel in both academic and non-academic pursuits during their studies. This year, a total of 26 students were selected as outstanding students at the departmental level. Eight outstanding students were also recognised at the faculty/school level. Among them, the Outstanding Student Awardee of the School of Hotel and Tourism Management was named the Most Outstanding PolyU Student of the Year.

The Most Outstanding PolyU Student Award 2020 goes to...

Onyx Wong Hei-ching,
BSc (Hons) in Hotel Management
School of Hotel and Tourism Management

Onyx (second from left) enjoys her internship at Hotel ICON.

Onyx shares her joy of receiving the Most Outstanding PolyU Student Award with Professor Kaye Chon, Dean and Chair Professor, SHTM.

"Challenges are the impetus for personal growth," said Onyx Wong, a final year student of the Bachelor of Science (Honours) in Hotel Management programme. She is also the recipient of prestigious scholarships, including the Hong Kong Hotels Association Scholarship and the HKSAR Government Scholarship Fund – Reaching Out Award.

In her very first lessons at the School of Hotel and Tourism Management (SHTM), her professors gave her a splendid challenge – to embrace professionalism. With the desire to become a professional hotelier, she took every opportunity to acquire industry experience, cultivate an entrepreneurial spirit, and learn to work as part of a team. She spent half a year as an intern at Hotel ICON, PolyU's teaching and research hotel, where she was challenged to think hard about the purpose behind each task she was assigned.

"The internship experience helped me form a comprehensive picture of hotel operations and made me realise that I should always be willing to take one step further to assist the guests and be more attentive to their needs," Onyx said.

A small achievement during her internship also had an important influence on her willpower to succeed. After numerous failures, she was finally able to master coffee brewing. "I made mistakes repeatedly, but just kept on trying and practising until I did it. That strengthened my determination to succeed."

Onyx has also stepped out of her comfort zone, physically. It was her first time travelling alone when she left for Australia for exchange. She embarked on the journey with worry and excitement, but soon she was fascinated by the new environment and started making friends from different countries. The international exposure not only widened her horizons, but also shaped her attitude. She became more outgoing and independent. She even proactively set challenging goals for herself - learning Spanish, surfing, and skydiving.

While studying her Service-Learning subject, Onyx encountered another challenge. Her task was to organise a series of learning activities for primary school boys with special educational needs. In serving these students, who have learning difficulties or disabilities that may induce emotional or behavioural problems, Onyx realised how sincerity and patience could help connect hearts and build relationships. The experience also inspired her to become a global citizen caring for the underprivileged.

Onyx has enjoyed a prolific learning journey and fruitful university life. "I had never imagined the knowledge, competence, and growth I could gain in these four years. I am grateful that PolyU has given me so many opportunities and wonderful experiences that shaped me to become who I am today."

Onyx (second row, second from left) and her teammates from PolyU's skipping team work hard to become the overall champions of the Hong Kong Inter-School Rope Skipping Competition.

Outstanding Student Awardees of Faculty/School

Zhao Xiaohan
BSc (Hons) in Investment Science, Department of Applied Mathematics
Faculty of Applied Science and Textiles

"By getting exposure to diverse cultures and making friends from different backgrounds, my creative thinking and cultural adaptability have been enhanced. Diversity inspires me to view the world from different perspectives and explore endless possibilities in life."

Michelle Lee Tsz-sum
BBA (Hons) in Marketing, Department of Management and Marketing
Faculty of Business

"To me, university life is like driving a car. At times, you need to refill, you will face bumps, you may diverge from your intended route, or you may even crash; but all these experiences and the scenery along the way make the journey fruitful and meaningful."

Maggie Ng Tsin-tung
BSc (Hons) in Surveying, Department of Building and Real Estate
Faculty of Construction and Engineering

"I conducted my Service-Learning project in Kyrgyzstan and I had an unforgettable time. I served as a volunteer teacher to teach the local students about nutrition. The volunteering experience shaped me to become a more mature and responsible person."

Sin Ka-yin
BEng (Hons) in Aviation Engineering, Department of Aeronautical and Aviation Engineering
Faculty of Engineering

"One of my memorable learning experiences was working as an engineering intern at Cathay Pacific Airways (Bangkok Station), where I gained professional knowledge and valuable insights into the aircraft maintenance, repair, and overhaul industry."

Eunice Wong Ching-laam
BSc (Hons) in Optometry, School of Optometry
Faculty of Health and Social Sciences

"I will make good use of the knowledge and skills I learnt at PolyU to become a professional. I would like to thank the University for providing me with profound opportunities to enrich my life, my professors for their teaching and guidance, and my family and friends for their continued support."

Chelsia Chan Cheuk-sze
BA (Hons) Language and Speech Sciences, Department of Chinese and Bilingual Studies
Faculty of Humanities

"I found satisfaction from helping people with communication disorders to enhance their abilities in interacting with others. The exposure provided me with a more concrete idea of what speech therapy is, and has reaffirmed my aspiration to become a speech therapist."

Simon Wong Sing-wang
BA (Hons) in Digital Media
School of Design

"If I have to choose one word to describe my life at PolyU, I will say 'enriching'. The numerous opportunities provided by the School gave me another perspective on what it means to have a fruitful life. Many memorable and splendid moments in my life happened here."

Shining examples of PolyU's endeavour to nurture future leaders

PolyU held the Outstanding Student Award Presentation Ceremony on campus in March. During the ceremony, President Jin-Guang Teng encouraged the outstanding students to make full use of their expertise and brilliance to pursue their dreams and benefit society. He regarded them as "the shining examples of our University's endeavour in nurturing future leaders who have excellent professional expertise, a caring heart, and a strong sense of social responsibility." Congratulations to all our awardees!

The Hong Kong Polytechnic University Magazine

Excel x Impact

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PolyU Motto
To learn and to apply,
for the benefit of mankind