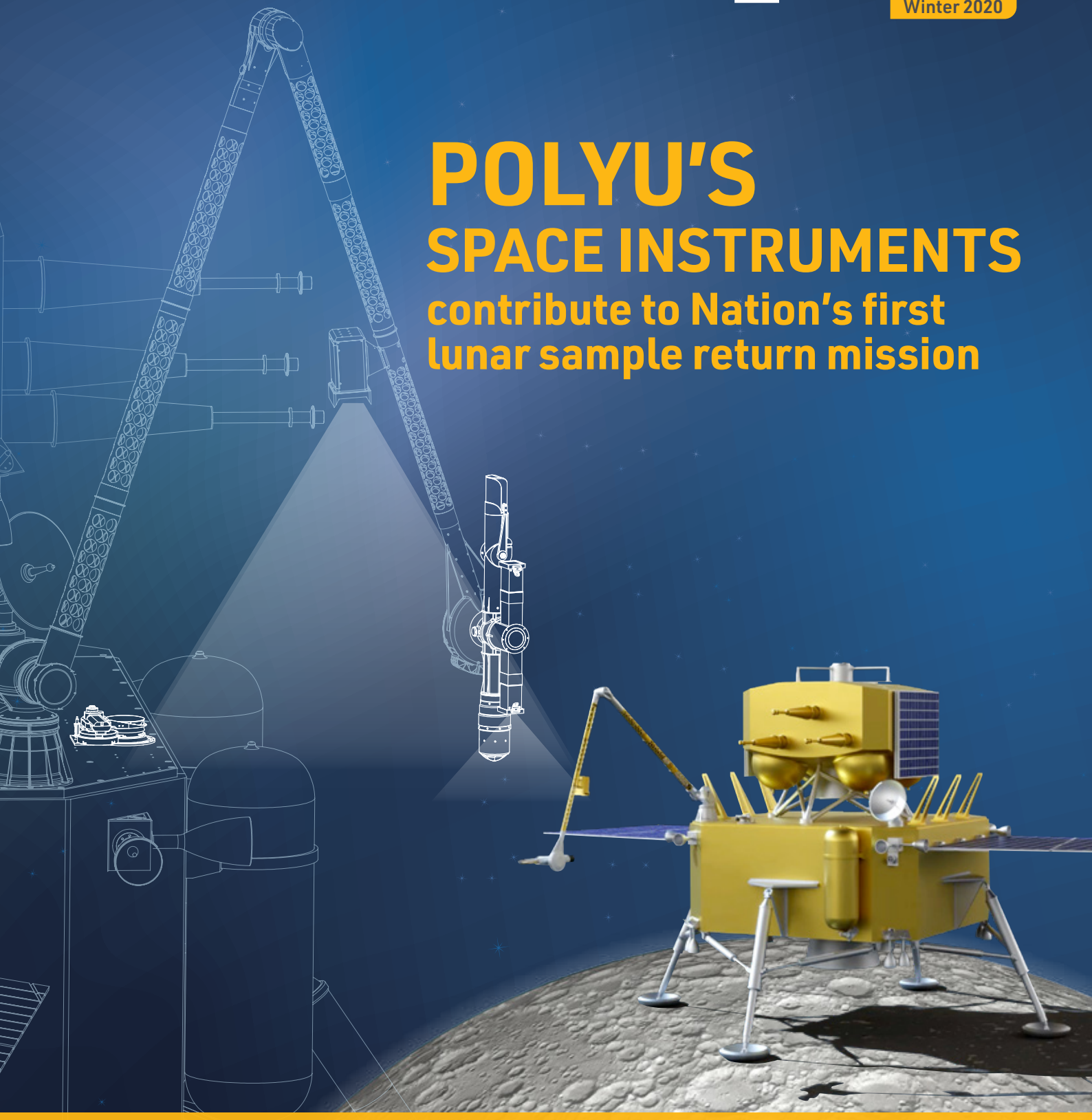
THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Excel x Impact

Winter 2020



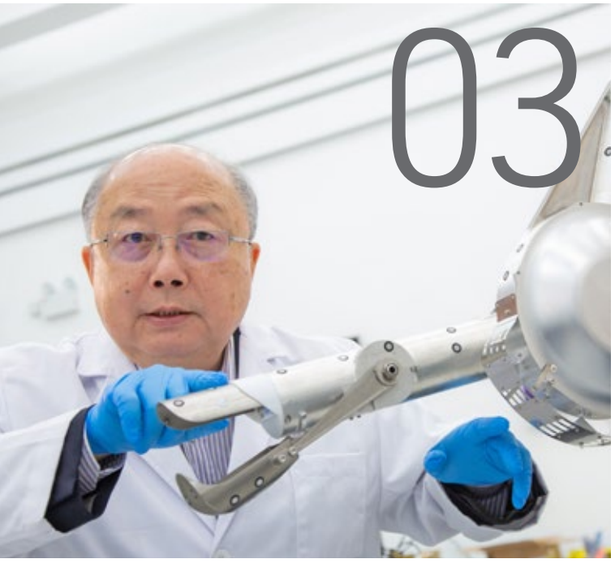
POLYU'S SPACE INSTRUMENTS contribute to Nation's first lunar sample return mission

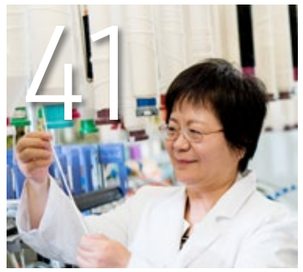
PolyU's Service-Learning initiative wins international award

Centenarian alumnus shares fond memories of his ties with PolyU

Textile scientist wins Guanghua Engineering Science and Technology Award

Contents | Winter 2020





President's Message

At the beginning of the new year, let me share with you some good news. PolyU's research excellence contributed to the Nation's first mission to obtain lunar samples, Chang'e 5. It successfully collected soil and rock samples from the Moon and brought them back to Earth. PolyU played a key role by developing and manufacturing the "Surface Sampling and Packing System", which was one of the critical components used in collecting the lunar samples. As the only local university which has contributed to this mission, we are proud to say that this advanced innovation was from researchers in Hong Kong, at PolyU. We look forward to taking part in the Nation's future space missions.

With regard to our teaching and in light of the ongoing pandemic situation, PolyU has been using different online teaching and learning platforms to enable students to continue with their education. Recently, the University Grants Committee (UGC) announced that it, along with its Quality Assurance Council, will allocate additional funding to support the UGC-funded universities in implementing various initiatives to promote the strategic development of virtual teaching and learning. PolyU will actively explore innovative solutions to enhance the overall experience and effectiveness of teaching and learning online.

In the Year of the Ox, I sincerely wish you good health, happiness and prosperity!

Jin-Guang Teng
President

The Hong Kong Polytechnic University
香港理工大學

POLYU'S SPACE INSTRUMENTS

contribute to Nation's first lunar sample return mission

The Hong Kong Polytechnic University's (PolyU) research excellence contributed to China's Chang'e 5 mission, which successfully collected lunar samples from the Moon and brought them back to Earth for the first time in the Nation's history. Through cross-disciplinary efforts, PolyU designed and manufactured the "Surface Sampling and Packing System", a state-of-the-art innovation that uses robotics for lunar sample acquisition. As the invention was developed and made in Hong Kong, the achievement not only reflects PolyU's capabilities, but those of the Hong Kong community as a whole.

Chang'e 5 was not only China's first undertaking to acquire rocks and soil from the Moon's surface, but it was also the world's first attempt to do so for more than 40 years since the last lunar mission occurred in 1976. The historic mission started when the Chang'e 5 spacecraft – comprising an orbiter, an ascender, a lander and a return vehicle – was launched by the Long March 5 rocket on 24 November 2020. On 1 December, the ascender and lander of the spacecraft landed on the Moon to collect lunar samples. The 23-day space expedition concluded when the Chang'e 5 capsule brought lunar samples back to Earth on 17 December.

Chang'e 5 collected moon samples through two means, using a robotic arm for surface sample collections and a drilling machine to collect underground samples. The "Surface Sampling and Packing System" developed by PolyU's research team in collaboration with the China Academy of Space Technology (CAST) was responsible for collecting the surface samples.

(From right) PolyU President Jin-Guang Teng, Council Chairman Dr Lam Tai-fai, Professor Yung Kai-leung and Deputy President and Provost Professor Wing-tak Wong at a press conference introducing the "Surface Sampling and Packing System".

> PolyU is honoured to be the only tertiary institution in Hong Kong to contribute to the Chang'e 5 mission.

Dr Lam Tai-fai, PolyU Council Chairman, said: "The collection of lunar samples is a landmark occasion in the history of our Nation's space exploration programme. It is a great testament to our University's cutting-edge research capabilities that PolyU was the only tertiary institution in Hong Kong to contribute to the Chang'e 5 mission."

The PolyU-developed system is a highly sophisticated invention that uses robotic technology for lunar sample acquisition – a method which is unprecedented. It was developed by a research team led by Professor Yung Kai-leung, Associate Head of the Department of Industrial and Systems Engineering, and Sir Sze-yuen Chung Professor in Precision Engineering. The team comprised more than 20 members, with Dr Robert Tam, Associate Director of PolyU's Industrial Centre, as a key member.

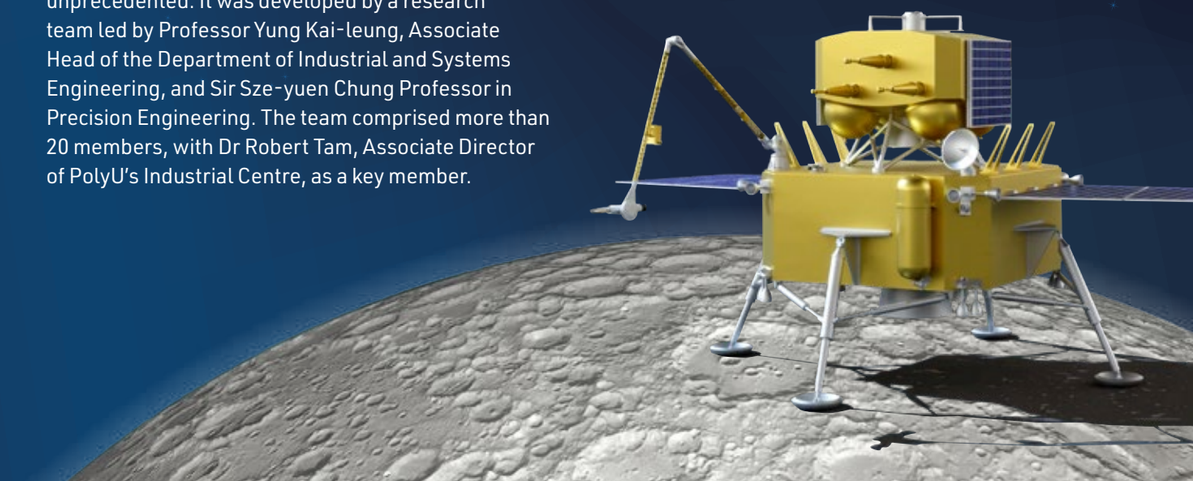
Challenges

- Resist temperatures as high as 200°C
- Endure impact and shock during lift-offs and landings
- Withstand the high-vacuum environment on the Moon
- Withstand solar winds and cosmic rays during the space journey
- The strict weight limit for each device used in the lunar mission

An unprecedented mission accomplished

While the regolith collection from the surface of the Moon took just 20 hours to accomplish, the lunar exploration project required many years of research and preparation work. The CAST commissioned PolyU to develop the sample collection and packaging device back in 2011.

"The challenge was that we were preparing for the unknown. We had no definite idea of what to do and what to design because there was no reference available. Collecting a large quantity of lunar samples through robotic means was unprecedented," Professor Yung explained. It was not until 2017 that his team finally solved all the technical problems to deliver the project.



1. *Sampler A, which is around 35 cm in length, is engineered for collecting loose regolith. It can dislodge excessive debris, chisel away large pieces of regolith, and deposit the selected samples into the container without contaminating the surroundings.*
2. *Sampler B, which is around 30 cm in length, is used to collect sticky samples by coring into the ground using teeth-like metal flaps.*
3. *Heat resistant up to 130°C, a near-field camera is attached to each sampler. This camera provides a monitoring and vision guidance system to enable the selection of scientifically valuable lunar samples.*
4. *The whole System weighs 1.5 kilograms, of which the sample container weighs only 360 grammes and is used to seal and store the lunar samples for retuning to Earth.*

Professor Yung's team had to overcome various hurdles created by the extreme environment of the Moon and outer space. These included the high daytime surface temperature of the Moon, the impact and shock the equipment would endure at different stages of the lunar journey and very strict payload constraints.

A system with 400 components

After six years of continuous effort and thousands of rounds of trials, the team finally came up with a system made up of more than 400 components, with each component made of the optimal material, such as titanium alloy, aluminum alloy and stainless steel.

Every component of the System was precisely designed for the mission. "The manufacturing of the System parts is technically complex and requires a very high level of precision, accuracy and reliability," Dr Tam said. PolyU's pioneering Industrial Centre played a pivotal part in the manufacturing, assembling, testing and quality control of the space instruments.

Designed to withstand temperatures of 200°C, the state-of-the-art System contains two samplers to collect lunar regolith in both loose and sticky forms. It also has two built-in heat-resistant near-field cameras for vision guidance during sample acquisition, and a sealing and packaging system to store and seal the samples in a container.

To comply with the stringent weight constraint, the samplers were designed to be able to perform multiple functions. As well as acquiring lunar regolith, they were also able to pick up and move the sample container from the lander to the ascender. "To keep all the components cool, something like a refrigerator was also included in the compact design," Professor Yung said.

The meticulous efforts of the research team paid off. After Chang'e 5 landed on the near side of the Moon, the System's samplers acquired 2kg of surface material from the Moon and sealed them in the container. The robotic arm then lifted the container and placed it into the ascender. The ascender blasted off into lunar orbit, rendezvoused and docked with the orbiter and transferred the sample container to the return vehicle for the journey back to Earth.

20 years of experience in space exploration

PolyU has been participating in the Nation's space projects since 2010. The University collaborated with the CAST to develop the "Camera Pointing System" for Chang'e 3 in 2013 and for Chang'e 4's historic landing on the far side of the Moon in 2019, as well as creating the Mars Camera for Tianwen 1 in 2020. The "Surface Sampling and Packing System" will also be used for the Chang'e 6 mission.

PolyU has accumulated valuable experience in national and international space projects. Over the years, the University has also assisted in other space exploration projects, including the "Mars Rock Corer" for the European Space Agency's 2003 Mars Express Mission and the "Soil Preparation System" for the Sino-Russian Space Mission in 2011.

Revealing the secrets of the Moon

Lunar samples collected in Chang'e 5 mission will help the scientific community understand some of the mysteries of the Moon. As Chang'e 5 landed in a region of the Moon much younger than those previously visited, the specimens brought back to Earth will be the youngest-ever lunar samples collected, helping scientists gain a deeper understanding of the evolution of the Moon and the solar system.

With the successful re-entry of Chang'e 5's return vehicle to Earth, China became the third nation in the world to bring back lunar samples. President Jin-Guang Teng said: "PolyU has been honoured to participate in the national space exploration programmes. By contributing to such a sophisticated project, the University has demonstrated its substantial research capabilities and commitment to pushing forward the frontiers of technology and science." PolyU will continue to make contributions to Chang'e 6 and other national space missions through rigorous scientific research and the development of innovative technology.

Scan the code and watch the video about PolyU's "Surface Sampling and Packing System"

■ *Professor Yung with Sampler A designed for collecting loose regolith*

■ *Dr Tam pointing at Sampler B which is used for collecting sticky samples*

■ *Professor Yung kai-leung (centre) with the research team*

> Young people should be more aggressive in their careers. Don't loathe getting the short end of the stick.

PASSION and PERSEVERANCE

A conversation with Treasurer of the University Ms Loretta Fong

Ms Loretta Fong Wan-huen joined Arthur Anderson, which merged with PricewaterhouseCoopers (PwC) in 2002, after graduating with a Master's degree. She became a Partner at PwC, one of the "Big Four" accounting firms, in just 11 years. Ms Fong's success comes from her passion for her career and an inner drive to advance. Ms Fong, who has an international perspective and extensive experience in providing accounting, audit and consulting services to private and publicly listed entities, was appointed Treasurer of The Hong Kong Polytechnic University in January 2019.

With a wealth of experience serving as a board member in other public organisations, how do you see your role as Council Member at PolyU?

I serve as Treasurer on the University Council and the responsibility that goes with this role is much greater than that of just a board member of a public organisation. I have a fiduciary duty to stakeholders, a challenge that is heightened by PolyU being a government-funded university. In my role, I have to ensure that PolyU continues to have stringent mechanisms and proper internal control systems for its financial management. I work closely with the Management, related committees and offices to safeguard and manage the University's finances, ensuring resources are appropriately allocated for PolyU's strategic development. PolyU has launched a number of major initiatives in recent years to develop its human capital, further interdisciplinary research and increase its global presence, with the objective being a world-class university that has a positive impact on society. I am honoured to carry out the role of Treasurer and draw on my expertise and experience to contribute to the long-term development of the University.

What principles and strategies is PolyU adopting to ensure it has sufficient resources for its planned developments?

The University has adopted a prudent management approach for operating expenses and the stewardship of financial resources. While I also serve as Chairman of the Finance Committee and Member of the Investment Committee, I take reference from the system established by my predecessors. At PolyU, we divide the cash needs into three categories, namely short, medium and long term, and allocate the available resources to various pools according to the respective investment duration, so as to gain a conservative yet reasonable return.

Meanwhile, we evaluate our existing investment products regularly and identify new investment directions. Thanks to the many seasoned professionals on our Investment Committee, our performance is comparable to the market benchmarks despite the difficult investment environment caused by global economic volatility, the US-China trade tensions and the COVID-19 pandemic.

What special factors do you think have made PolyU a top university?

At PolyU, we have many dedicated academics and teaching professionals who are devoted to nurturing students, with a view to enabling them to have a rewarding learning experience. Many programmes offered by the University are also recognised for their high quality, for example, a large number of leaders in the accounting profession are PolyU graduates. Furthermore, the University is quick to move with the times by offering new programmes, such as Fintech, to meet rapidly evolving societal needs.

You have been working with the same accounting firm for more than 20 years since graduation. What is the driving force behind your career?

Back in my university days, I listened to my father's advice to take up business studies. I picked up accounting so quickly that I thought to myself, "maybe I have a talent!" I aspired to be a partner of an accounting firm ever since I graduated, simply because it is one of the fastest tracks to becoming a boss in 10 years.

Ms Loretta Fong (right) attending the University's Congregation

Some people say audit is boring, but it's anything but. Through providing audit services, you can get to know the operation of various industries in a very short period of time. What's more, you have to continue learning new things so as to keep up to date with the latest developments in innovation and technology in response to clients' needs.

To me, accounting is an art more than a science. Accountants must exercise judgement in applying accounting and auditing standards. This is why the work of accountants and auditors is so valuable and challenging.

What advice would you give to students with regard to their career planning?

Aspiration varies from person to person. The most important thing is to be clear what they want to achieve in their lives and plan their careers accordingly. They should choose a career that they are passionate about. Like me and many of my seniors, we enjoy going to work every morning.

What important attributes and attitude would you encourage PolyU students to develop?

Besides acquiring professional knowledge and skills, I always encourage young people to explore the world with an open mind, such as through joining the University's exchange programmes. The aim is to experience different cultures and learn how to work with people from all walks of life. They will find it incredibly beneficial to their lives.

Young people should be more aggressive in their careers. Don't loathe getting the short end of the stick.

How do you unwind and relax?

I have a great passion for yoga which helps me stay focused and relaxed. One should develop a hobby and spend some time on something you like.

BUILDING CAPABILITIES

A Conversation with Executive Vice President Dr Miranda Lou

Dr Miranda Lou has extensive strategic, business and management experience in both the private and public sectors. Dr Lou joined PolyU in 2015 as Vice President (Administration and Business) and was appointed Executive Vice President in 2017. She oversees a diverse portfolio of administrative functions at the University, including resources management, commercialisation and entrepreneurship, communications, alumni and mainland affairs.

How does your experience and knowledge help you in your role overseeing the management and operations of the University? What do you think are the most important aspects of a leadership role in a university setting?
University administration appears to be very much different from business management in nature, but I believe they share commonalities in many aspects, say, in terms of commitment to excellence and growth, talent retention and management, accountability, and sustainability. In particular, my previous experience in managing businesses in a multi-national and multi-cultural setting has enabled me to appreciate the importance of embracing diversity and inclusiveness as well as ensuring collegiality across the campus.

There are always high societal expectations for universities – the convergent points for highly intellectual academics and professional administrators. For PolyU to excel, we must embrace talents and inspire them to work towards a shared vision. We are committed to providing them with an enabling environment where they can be at their best and be recognised for their contributions.

How do you assist PolyU in building its organisational capabilities?
We need financial, talent and information assets to strengthen the capabilities of an institution. My role as a member of the Finance Committee and the Investment Committee of Council as well as the Hostel Development Taskforce is to ensure that the University's financial resources are well managed not only for its near-term operating needs but also for its long-term development plans.

The University has launched a number of strategic hiring schemes to enhance its academic and research capabilities. For non-academic staff, I would like to introduce good practices from industry, such as job rotation and fast-track programmes to further support their career development, as well as exploring new modus operandi and collaboration models beyond the COVID-19 pandemic. Meanwhile, more needs to be done in strengthening our information capabilities, such as enhancing information platforms across different units and digitising services for students and staff.

One of the strategic focuses of PolyU is to promote knowledge transfer (KT). What is your vision for the future development of PolyU in this area?
KT is a long value chain reaching from research, technology development to application and commercialisation. The University has evolved over the past decade from consolidation of KT activities to more liberalisation of policies to support startup/spinout companies. Under the overriding principle that PolyU's intellectual properties should leave campus to create societal impact, the University has adopted new models of IP licensing and assignment as well as academia-industry collaborative centres for research and commercialisation. University Management will convene more forums to solicit views and suggestions of staff members so that the PolyU community can adopt an aligned position when advancing KT for impact.

Going forward, I wish to support more academic-led ventures commercialising PolyU's technology and innovations "for the benefit of mankind", as our motto goes. Their success is PolyU's success.

PolyU plans to make exposure to entrepreneurship a hallmark of its education. How will the University promote an entrepreneurial mindset among students?
We have already introduced a more holistic entrepreneurship framework covering education, incubation, industry mentorship and funding support. Further to the experiential entrepreneurship programmes for students and researchers, such as the most recent GBA startup postdoc programme, startup internship programme and market-technology pathway and validation programme, the University will launch a minor in innovation and entrepreneurship with multidisciplinary and experiential learning elements, among other new initiatives.

However, I wish to point out that the objective of promoting an innovative and entrepreneurial mindset is not merely to prepare students to become entrepreneurs; this mindset is also an essential attribute for future leaders, and corporate and social innovators.

What advice would you give to students to help them make their entrepreneurial dreams a reality?
Think why the market needs your innovation or product, what value you can create and what your differentiation is.

Once you have decided to pursue a path to becoming an entrepreneur, be resilient, persistent and prepared to encounter different challenges as the owner, not simply a manager, of the business. Thrive on and don't shy from mistakes or failure.

Is there a particular thought that you turn to when you need guidance or encouragement?
I am fond of a quote from Charles Dickens: "Have a heart that never hardens, and a temper that never tires, and a touch that never hurts." For me, it's a good reminder that with a soft heart, kindness and empathy, we can touch the lives of people around us.

Another quote is from Winston Churchill: "Success is not final, failure is not fatal: it is the courage to continue that counts."

With your busy schedule, what do you do to unwind and relax? What are your hobbies?
I think I need to get more exercise. I love sewing teddy bears for my friends, and I'm so happy to see their smiles when they receive my handmade gifts. I also love Chinese calligraphy which enables me to slow down my pace and stay focused. I wish I could have more time for these hobbies.

New taught postgraduate programmes to address societal needs

To address the changing needs of society, PolyU launched a selection of new taught postgraduate programmes in 2020/21, covering the fields of data science, international real estate and construction, medical physics, applied nutrition, school and community psychology, and smart cities.

Master of Science in Data Science and Analytics

Department of Applied Mathematics

This programme is exceptional in providing a balanced treatment on the three pillars of modern data science, namely Statistics, Optimisation Methods and Computer Science. Students will learn the latest mathematical, statistical and computing techniques in order to extract information out of large-scale data and make appropriate decisions. Their training will enable them to become data analysts in a broad range of industries including finance, information technology and artificial intelligence.

Doctor of International Real Estate and Construction

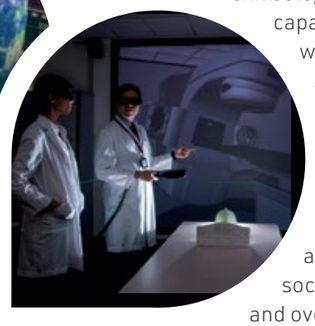
Department of Building and Real Estate

The first professional doctorate in real estate and construction in Hong Kong, the programme equips seasoned executives with theoretical and technical knowledge of the industry in Asian and global contexts. In addition to developing their management and leadership skills, the programme will inspire them with comprehensive analytical methods to address industry challenges and tackle the complex influences of public policies and the global economic environment. It will prepare students to take up senior management roles in the real estate and construction market.

Master of Science in Medical Physics

Department of Health Technology and Informatics

Medical physicists specialise in radiation diagnosis and treatment technology, with expertise spanning from medical imaging to radiotherapy. The first of its kind in the region, the PolyU programme aims to broaden students' perspectives in medical science and technology development, and equip them with professional knowledge and relevant skillsets, as well as research capabilities. Aligned with international standards, the programme has established close connections with local hospitals, the healthcare industry, and medical physics societies in Hong Kong and overseas.



Master of Science in Nutrition and Healthy Ageing

Department of Applied Biology and Chemical Technology

This unique programme aims to produce well-trained nutritionists who serve Hong Kong's needs to prevent and control non-communicable diseases among the ageing population. It is the first MSc nutrition programme in Hong Kong offering practicums in community settings, with a curriculum based on the standards of the UK Association for Nutrition. The profession-oriented programme will allow students to gain a deeper insight into promoting health education and disease prevention.

Master of Arts in School and Community Psychology

Department of Applied Social Sciences

In addition to acquiring specialised knowledge and skills, students of psychology need to solidify their critical thinking and research skills. They must also strengthen their foundation in fulfilling professional obligations, making ethical decisions and understanding policies. This programme aims to provide students with these perspectives and the necessary tools, with an emphasis on self-development, self-reflection and real-life applications to tackle school and community issues. Graduates will be prepared for careers in the fields of psychology, education, and community and human services.

Master of Science/Postgraduate Diploma in Urban Informatics and Smart Cities

Department of Land Surveying and Geo-Informatics

This interdisciplinary programme leverages emerging technologies such as the Internet of Things, Artificial Intelligence and Big Data to provide students with a foundational understanding of the theories of urban systems and science, training in new technologies, and hands-on experience in developing smart city solutions. Graduates will be equipped with the technological knowhow for smart and sustainable urban development to pursue a career in a broad range of industries, including information technology, urban planning, logistics, public health, social welfare, and finance.

Leveraging the University's educational excellence, these new programmes are designed to nurture professional leaders in their respective fields who will drive positive changes in society.

PolyU wins LearnX Award for online teaching

PolyU scooped a prestigious Platinum Award in the category "F2F Classroom Training Transfer to Virtual Classroom Training Initiative" at Australia's LearnX Live! Awards 2020.

The honour recognises the University's e-learning initiatives that transfer face-to-face (F2F) classroom training to virtual-classroom, instructor-led training and its strategies to counteract the disruptions caused by COVID-19 in 2020. Based on a series of new pedagogies, including open pedagogy, curriculum co-creation, and open educational resources, the initiatives have created a refreshing learning environment for our students.

Dr Eric Tsui, Senior Education Development Officer of PolyU's Education Development Centre, who hosted training seminars on the new pedagogies for PolyU teachers, said, "The LearnX Live! Awards is an international awards programme that recognises multiple fields within learning, development and talent management across the corporate, education and public service sectors worldwide. PolyU's award win is a testament to the University's expertise in leveraging technologies to deliver best practice and facilitate students' learning."

PolyU has begun to move all face-to-face teaching to an online platform since January 2020. Academics adopted a customised approach to engage students in their online teaching sessions, without compromising the quality of learning and teaching. Today, PolyU has become one of the largest online teaching communities in Hong Kong.

PolyU scholarships enable student-athletes to pursue their dreams

PolyU has always supported the nurturing of outstanding athletes in Hong Kong, providing an environment in which its student-athletes can excel in academics, sports, as well as whole-person development. Since the University launched the Outstanding Sportsmen Recommendation Scheme (OSRS) in 1998, more than 1,000 athletes from the Hong Kong National Team or Junior Squad have been admitted to PolyU to pursue their sporting careers while studying in its full-time programmes.

In the 2020/21 academic year, 70 elite athletes from 26 sports were enrolled at PolyU through the Scheme. Among them, 40 were awarded entry scholarships, ranging from HK$10,000 to full annual tuition fee waivers of HK$42,100.

Alongside awarding scholarships, PolyU also offers different types of support for elite student-athletes to enable them to excel at both sports and study. These measures include providing student-athletes with individual mentors for their academic work, flexibility in study assessment schedules, and extension of study periods to help them cope with their intensive training routines and worldwide competitions.

In addition, PolyU offers professional physiotherapy services to help reduce the incidence of injuries among all the athletes and speed up the recovery of those who are injured. They include the provision of rehabilitation services, physical training and sports injury workshops.

With the University's support, PolyU's athletes have achieved impressive performances. PolyU won the Yearly Men's and Yearly Women's Overall Championships at the Inter-collegiate Competition in both 2017/18 and 2018/19.

In recent years, PolyU has led the way among local institutions in terms of student-athlete intake and the number of sports scholarships available, with about 50 entry scholarships totaling more than HK$1 million offered to outstanding athletes. Together with other kinds of scholarships, PolyU offers more than 200 scholarships totaling over HK$4.2 million to student-athletes every year, in recognition of their sports achievements and to support their studies.

Handballer Kan Yik-fai, a third-year student of Land Surveying and Geo-Informatics, received a full tuition fee waiver through the Scheme. He said athletes have to allocate their time better than other people to manage both their studying and training. "My goal is to represent Hong Kong to compete in the National Games and Asian Games," Yik-fai said.

Sophia Wu, a member of the Hong Kong Women's Fencing Team, became a full-time athlete in July 2020, just before she became a first-year student on PolyU's marketing programme. Sophia, who received a full tuition fee waiver, said her training schedule is very packed. She often has meals in classes between training sessions. She said: "My goal is to represent Hong Kong to compete in the Asian Games 2022 and Paris Olympics in 2024." Recently, Sophia was named a winner of the Student of the Year Awards for her outstanding performance in sports. The Awards, organised by the South China Morning Post, with support from the Education Bureau, are among the city's most prestigious honours for local youth.

■ *Professor Ben Young (back row, third from left), PolyU's Vice President (Student and International Affairs), said PolyU is committed to providing an environment where our student-athletes can excel in academics, sports and whole-person development.*

From Hong Kong to Saudi Arabia: Developing academic programmes in tourism and hospitality management

A symbol of excellence in the field and ranked among the top hotel and tourism schools in the world, PolyU's School of Hotel and Tourism Management (SHTM) offers high-level consultancy and professional advisory services to both private and public organisations worldwide. Recently, the SHTM secured a consultancy project to develop academic programmes in tourism and hospitality management for the University of Tabuk (UT) in Saudi Arabia.

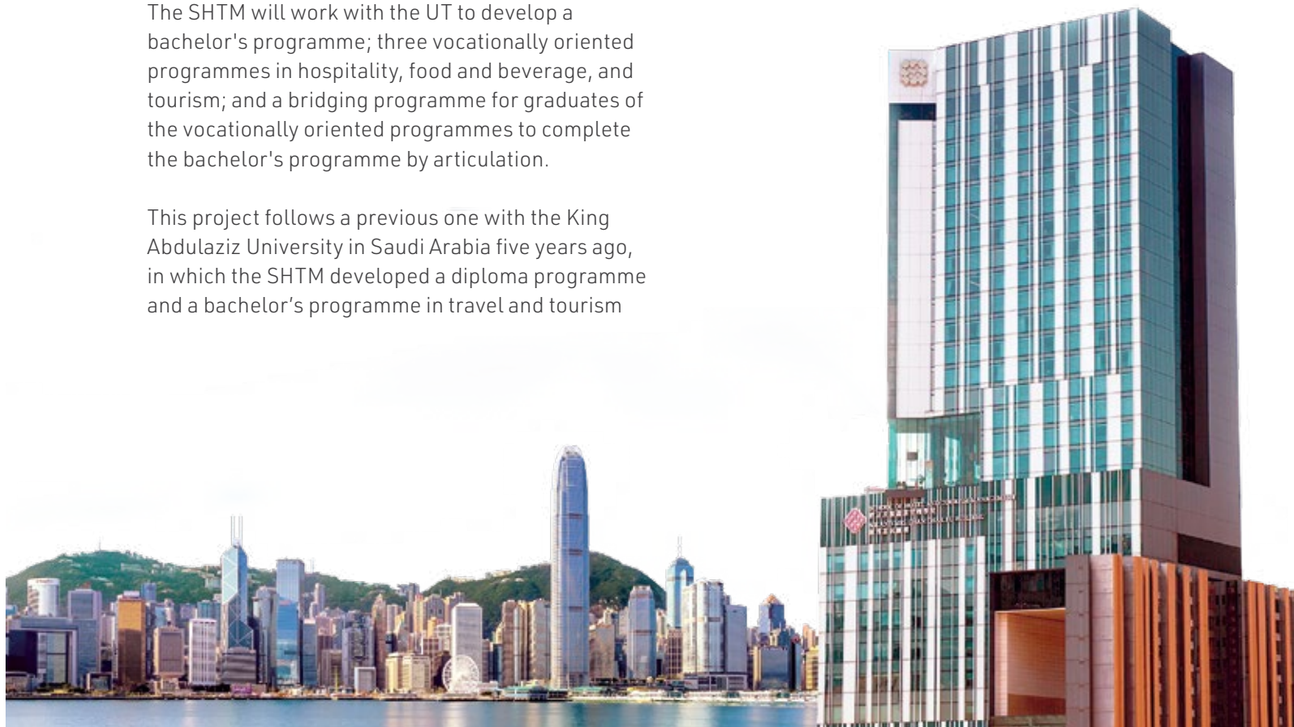
A country with a rich historical and cultural heritage, Saudi Arabia has enormous potential for tourism development and large tourism projects are underway to develop luxury destinations in its northwestern region. Located in the same region, the UT is establishing a new College of Tourism and Hospitality to complement the university's development and meet the talent needs of the industry.

The SHTM will work with the UT to develop a bachelor's programme; three vocationally oriented programmes in hospitality, food and beverage, and tourism; and a bridging programme for graduates of the vocationally oriented programmes to complete the bachelor's programme by articulation.

This project follows a previous one with the King Abdulaziz University in Saudi Arabia five years ago, in which the SHTM developed a diploma programme and a bachelor's programme in travel and tourism management, and a master's programme in event and tourism management.

"Our consultancy projects in Saudi Arabia fully demonstrate our School's knowledge transfer competence in designing tourism and hospitality programmes for countries that recognise the importance and potential of tourism and hospitality development and higher education," said Professor Kaye Chon, Dean of the SHTM, Chair Professor and Walter and Wendy Kwok Family Foundation Professor in International Hospitality Management. "We are very proud to share our experience and knowledge in nurturing talents for the sustainable development of the industry with peer institutions."

Over the years, the School's expert consultants have worked on many successful consultancy projects with clients from around the globe. In 2018, the SHTM further stepped up its service to the hospitality and tourism sector by collaborating with its teaching and research hotel, Hotel ICON, to launch the SHTM+ICON Consultancy. Combining a unique educational model, cutting-edge research and an award-winning hospitality experience, the Consultancy is committed to engineering knowledge transfer to the industry and other education institutes.



PolyU's research brings changes to

HEALTHCARE AND MEDICAL SERVICES

Three PolyU medical innovations have won Global Innovation Awards at the TechConnect Business Virtual Summit and Showcase 2020. The PolyUStimulator is the first battery-free device that can achieve the same neurostimulation outcomes as a conventional electrically-powered one. An AI-based risk assessment system for knee osteoarthritis can aid clinical practitioners in creating personalised treatment plans. A new type of nanoparticle that becomes fluorescent when exposed to UV light can improve the treatment of diseases, such as liver cancer and diabetes. These advances in research have great potential to benefit patients.

PolyUStimulator – A powerful new medical tool (batteries not included)

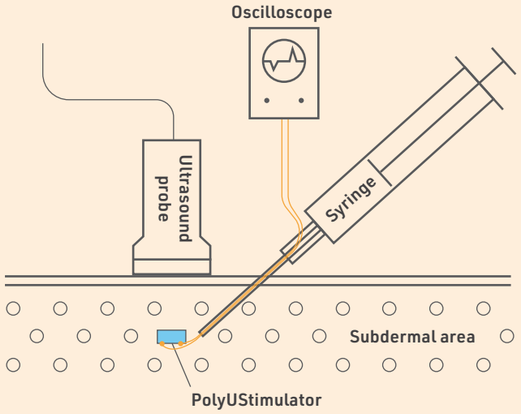
For patients who have suffered a neurological injury, such as spinal cord damage or chronic pain, neurostimulator implants offer the hope of regaining lost mobility or pain relief without medicine. But despite their benefits, these electrically-powered devices still have some limitations.

Most existing implantable neurostimulators rely on internal battery packs to power their operation and, therefore, have a relatively short lifespan. Additionally, the neurostimulators have to be implanted through a surgical procedure. Even more alarming, their batteries could potentially leak inside the body.

These drawbacks could soon be overcome, thanks to the work of two PolyU researchers – Dr Monzurul Alam, Research Assistant Professor, and Professor Zheng Yongping, Henry G. Leong Professor in Biomedical Engineering – both from the Department of Biomedical Engineering. They have come up with a different kind of implant which they call the PolyUStimulator. As they explain, the name was coined by combining the 'U' in PolyU with the 'S' in Stimulator to represent the harvest of ultrasound energy to drive the new device.

Small, safe and simple

The PolyUStimulator transmits ultrasound energy into the body through the skin and converts it into a piezoelectric stimulation current through a tiny



The PolyUStimulator can be as small as 1 mm in diameter, tiny enough to be safely injected under the skin.

implanted device that operates without wires or the need for an internal battery. Once the device is implanted inside the body, it provides electrical stimulation when an ultrasound source is applied to the skin's surface.

"It is a very simple device," Professor Zheng says. "The energy harvested from ultrasound is an alternating current, which is converted by the device into a pulsed current suitable for electrical neurostimulation. The beauty is that we can make the device very small – tiny enough to be injectable, thus avoiding surgery."

Dr Monzurul Alam (left) and Professor Zheng Yongping

Dr Alam, an expert in spinal cord injuries, says, "We sent energy from outside the animal's body to the implant connected to the muscles. When the electrical charge sent a pulse to the muscle, the muscle contracted causing the leg to move similarly to implanted functional electrical stimulation, an established treatment for the paralyzed.

Next steps

Although the PolyUStimulator is still in the early stages of development, it has great potential as a therapeutic tool for treating patients who have had a spinal cord injury or who suffer neuropathic pain, as well as healing complex bone fractures.

To further develop their stimulator, Dr Alam and Professor Zheng still need to find appropriate coating materials for fabrication to avoid rejection by the body and the optimal way to fix it in the desired position.

Despite these issues, it has already received recognition in the journal *Bioelectronic Medicine*, which stated in a commentary that the PolyUStimulator was the first battery-free device that can achieve the same effect for neurostimulation as a conventional electrically powered one.

The advantages of ultrasound are that it can reach deep inside the body where conventional inductive energy cannot safely reach, and is safe from radio frequency interference. Additionally, the stimulation can be controlled and adjusted by the external ultrasound source and even used across multiple channels through different modules tuned to different ultrasound frequencies. As it is designed to be biocompatible, it could potentially last as long as the patient lives.

Although no human studies have yet been carried out, the efficacy of the stimulator has been demonstrated in animals.

AI-based risk assessment system for knee osteoarthritis

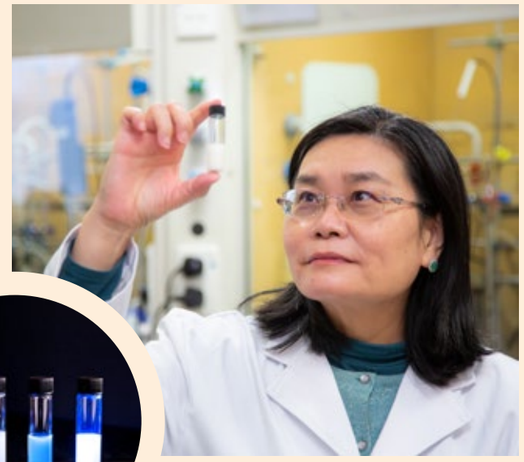
Early detection of knee osteoarthritis (KOA) is critical for preventing disease progression and reducing the need for joint replacement surgery. With a view to facilitating the treatment, MPhil students Toby Li and Justin Chan developed a "Time-dependent Machine-Learning-based Prediction System for Progression of Knee Osteoarthritis" under the supervision of Dr Wen Chun-yi, at the Department of Biomedical Engineering.

The AI-based system can predict the risk of KOA progression by analysing medical data, including tabular electronic health records and knee radiographic images. With a precision rate of more than 80%, the prediction system can aid clinical practitioners in performing efficient triage and constructing personalised treatment plans. A mobile application is also being developed to measure and record patients' relevant physiological data on a regular basis, facilitating continuous tracking and self-management of the disease.

"I hope this AI predictor can become a kind of preventive medicine, and that chronic disease management with AI can expand to other musculoskeletal and ageing-related diseases, such as osteoporosis, Alzheimer's disease, heart attacks and strokes in the future," Li says.

(From left) Justin Chan, Dr Wen Chun-yi and Toby Li

Shedding new light on nanocarriers for drug and gene therapy



(Top) Professor Li Pei is making inroads in the field of nanocarriers and the treatment of diseases, such as liver cancer.

(Left) When exposed to UV light, the two tubes of solution on the right containing nanoparticles become fluorescent.

Nanocarriers are microscopic nanoparticles that have been developed for bringing drugs or genes to parts of the body that would normally be inaccessible. However, the technology is still being perfected. Delivering drugs to predetermined areas of the body continues to be challenging. Moreover, it can be difficult to trace the movement of the nanocarriers within the body after they are injected into a patient.

The first of these challenges was overcome by Professor Li Pei of PolyU's Department of Applied Biology and Chemical Technology, when she and her team developed a novel type of amphiphilic core-shell nanocarrier that can efficiently deliver a gene into a cell with great precision.

"It is extremely difficult to carry a gene into a cell, as genes are very delicate molecules that degrade easily," Professor Li says. "We were able to create a nanocarrier with a two-layer structure that encapsulates the gene in its surface. This protects the gene when it is travelling in the body, and the protective layer is able to open and release the gene inside the cell."

Professor Li adds that her nanoparticles have demonstrated successful delivery of genes for the treatment of liver cancer and insulin resistance in diabetes.

Where do the nanoparticles go?

The second challenge, that of tracking a nanocarrier once it is inside the body, came up during an exhibition in San Francisco a few years ago. At that time, a big pharma company expressed interest in Professor Li's work, but had a concern."They asked where do these nanoparticles go after they are injected into the body?"

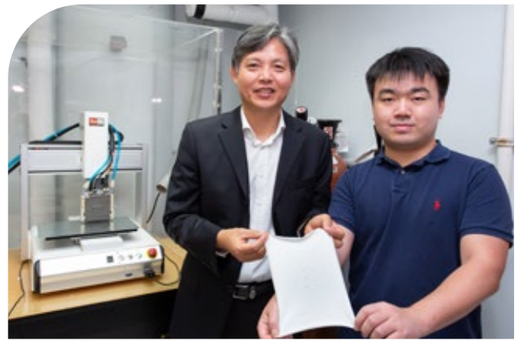
This is an important question as it is critical to know whether the nanoparticles remain in the body during therapeutic treatments or if they are expelled through urine or faeces. The question motivated Professor Li to develop a new type of nanoparticle that becomes fluorescent when exposed to UV light.

This development has opened up a range of new possibilities, including biomedical applications such as bioimaging markers for vitro cell imaging, image-guided therapy, diagnostic imaging and chemo sensors. Other non-medical applications include fluorescent ink for anti-counterfeiting and "smart coatings" that make paint responsive to UV light.

Although further research and development is still required before Professor Li's photoluminescent nanoparticles can be fully licensed, she remains optimistic about their potential as she was able to obtain a US patent for them in a relatively short period of time.

Each of the three innovations won a Global Innovation Award at the **TechConnect Business Virtual Summit and Showcase 2020**. Held in Boston, in the US, TechConnect is the world's largest multi-sector event for fostering the development and commercialisation of innovations. The Global Innovation Awards identifies the top 15% of submitted technologies based on their potential positive impact on a specific industry sector. More than 400 submissions were received in 2020, including those from leading global universities and technology enterprises.

"Skin-like" fabric keeps people dry during exercise



Professor Fan Jintu (left) and Dr Shou Dahua, Assistant Professor (ITC), with the "skin-like" fabric

A research team led by Professor Fan Jintu, Head of PolyU's Institute of Textiles and Clothing (ITC) and Chair Professor of Fiber Science and Apparel Engineering, has developed a "skin-like" fabric that keeps people dry during exercise.

The directional liquid transport fabric enables sweat to evaporate through spatially distributed channels which act like sweat glands, while also providing a barrier to water from outside. The research, which took four years to develop, was published in *Science Advances* in April 2020.

Existing commercially available breathable fabrics have a moisture transmission rate of up to 460 g/m^2 per hour, significantly less than the 1,000 to 2,000 g/m^2 per hour rate at which the average person doing moderate exercise sweats. The novel "skin-like" fabric, however, has a moisture transmission rate of 6,600 g/m^2 per hour – 15 times greater than that of best commercially available breathable fabric. The moisture-wicking feature of the fabric enables people to exercise more comfortably without becoming wet.

The novel fabric design, which has been patented in the US, also has high water repellency. Professor Fan said that while the fabric was still in the experimental stage, his research team was working on further enhancing its water repellency, as well as applying the technology to sportswear, protective clothing and casual wear.

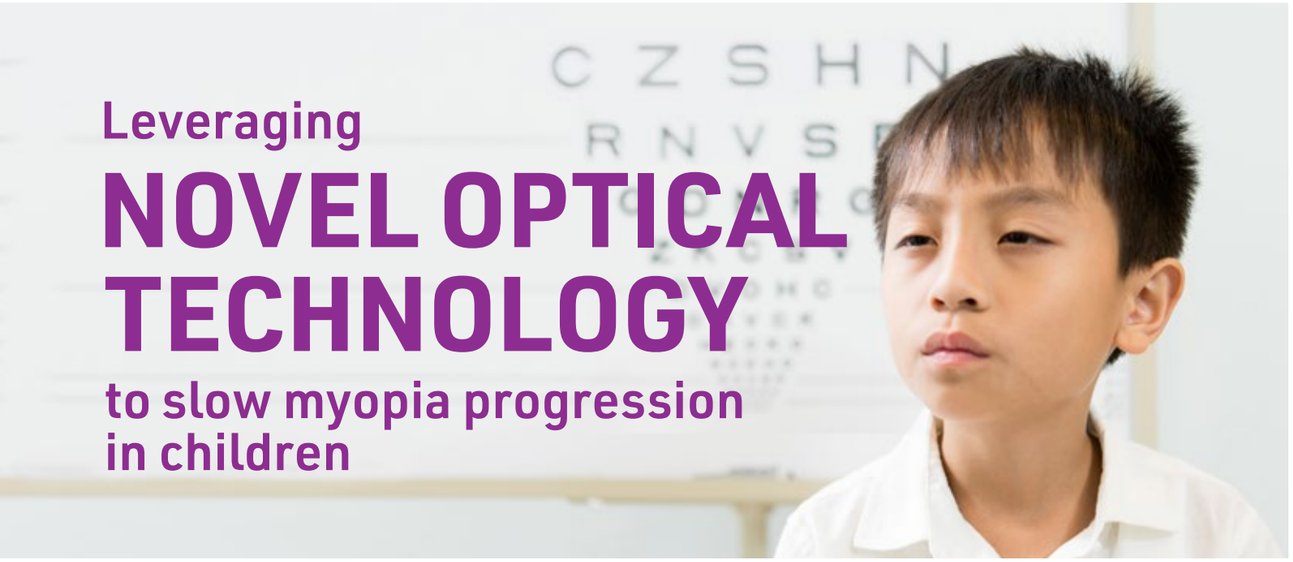
Robot "Alice" alleviates elderly people's loneliness

Professor Johan Hoorn and his research team have won the Huibregtsen Prize 2020 for their robotics research project "Alice", a robot girl who helps elderly people feel less lonely. He teaches at both the Department of Computing and the School of Design of PolyU.

After noticing that loneliness was a major problem in ageing societies, Professor Hoorn worked with Professor Elly Konijn of Vrije University Amsterdam to develop "Alice", combining artificial intelligence with remote-controlled functions. Acting as an electromechanical grandchild, "Alice" helps to relieve loneliness and improve the quality of life of elderly people through being their companion, chatting to them and responding empathically to what they say.

The Huibregtsen Prize, which was established in 2005, is awarded annually to a research project where scientific innovation has the potential for social application. Professor Hoorn was one of the six nominees for the 2020 Prize. He hopes robots like "Alice" can be used to meet a range of social challenges in healthcare, education, and services. He is currently working on another project with the Laboratory for Artificial Intelligence in Design at the Hong Kong Science Park to develop social robots to help alleviate depression among young people in Hong Kong.

Photo source: Fred van Diem



Leveraging
NOVEL OPTICAL TECHNOLOGY
to slow myopia progression in children

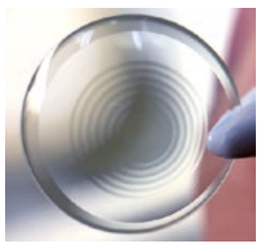
Myopia (short-sightedness) is an eye disorder that affects a third of the world's population. High myopia can lead to sight-threatening complications, including retinal detachment, macular degeneration, cataracts and glaucoma. As a result, it is important to keep myopia progression under control, especially among children. Fortunately, the efforts of PolyU researchers, an academic-led start-up and a research collaborator of the University have led to non-invasive and viable options to control the development of myopia in children around the world.

In 2000, a School of Optometry research team led by Professor To Chi-ho, Chair Professor of Experimental Optometry, Henry G. Leong Professor in Elderly Vision Health and Head of the School of Optometry, and Professor Carly Lam, started a research project on myopia control in children. Dr Dennis Tse, Associate Professor, also participated in the project. The team eventually developed a revolutionary "myopic defocus" method, based on the natural homeostatic mechanism of the eye. The method aims to produce a clear image on the retina and a defocused or blurred image in front of the retina simultaneously, enabling children to have clear vision, while also controlling the progression of myopia.

DISC: Soft contact lens slows myopia progression by 60%

The Defocus Incorporated Soft Contact (DISC) lens was the first product developed using the method. A clinical trial with Hong Kong schoolchildren aged between 8 and 13 showed that DISC lenses slowed myopia progression by about 60% when the lenses were worn for eight hours every day during the two-year trial period.

To facilitate commercial production of the DISC lens, Professor To and a PolyU graduate founded the start-up Vision Science and Technology Co. Ltd (VST) in 2016. Alongside receiving funding support of HK$1.1 million from the HKSTP-PolyU Tech Incubation Fund and the PolyU Tech Launchpad Fund, VST has also secured more than HK$2.3 million of further investment over the years. In 2018, PolyU and VST entered into a licensing arrangement under which VST manufactures and provides DISC lenses at its authorised optometric clinics and fitting centres, while the University prescribes DISC lens at its Optometry Clinic and provides training in fitting the DISC lens to the eye for optometrists.



The DISC lens is a multizone soft contact lens.

A year after DISC lenses were made available in Hong Kong, VST launched a daily disposable version, DISC-1 Day. It is now available in Hong Kong and Mainland China, with expansion plans in the Asia Pacific markets.

"I am glad that after years of hard work, research on the DISC lens eventually bore fruit through successful commercialisation, benefitting children in need with a real product," Professor To said.

DIMS: Spectacle lens slows myopia with 59% efficacy

To cater to people who find contact lenses uncomfortable to wear, or those who are prone to eye infections, PolyU and its research collaborator HOYA Corporation jointly developed the Defocus Incorporated Multiple Segments (DIMS) Spectacle Lens, co-owning the technology and patent rights.

Although the same mechanism is applied in DIMS and DISC lenses, researchers faced an added challenge when developing the spectacle lens. "Because the eye moves behind the spectacle lens, the myopic defocus optics have to be incorporated all over the lens," Professor Carly Lam explained. The problem was solved by dividing the DIMS lens into zones. The central zone consists of a regular concave lens for corrected vision at the centre of the retina, while the rest of the lens is made up of numerous tiny lenses that focus light slightly in front of the retina to create peripheral myopic defocus. In doing so, the lens provides clear vision for the wearer at all viewing distances.

The DIMS lens is made up of numerous micro-lenses.

DIMS has been clinically proven to be effective at slowing down myopic progression by 59% in children in Hong Kong.

Global impact

DIMS lenses offer a solution as the first line of treatment for myopia control, slowing and even preventing the development of high myopia, which is the second most common eye condition that causes visual impairment and permanent blindness in Asia. Since their launch in mid-2018, DIMS lenses have gained wide acceptance in the market, benefitting more than 350,000 myopic children. DIMS lenses are now available in Hong Kong, Mainland China, Taiwan, Singapore, Malaysia, Australia, New Zealand, Canada, Italy, the UK and France.

The invention and subsequent development of the defocused lenses is an excellent example of how the successful commercialisation and transfer of PolyU technology, facilitated by entrepreneurial efforts, can bring benefits to the world.

The pioneering"myopic defocus" method invented by Professor Carly Lam (left) and Professor To Chi-ho (right) has won many awards over the years, including a Grand Prize and a Special Gold Medal at the 39th International Exhibition of Inventions of Geneva; the Grand Prize (Overall Championship), a Grand Award and a Gold Medal with the Congratulations of Jury at the 46th International Exhibition of Inventions of Geneva; and the 2020 SILMO d'Or Award (Vision) at the SILMO optical fair in France.

PolyU's nano-based ink technology helps industries forge ahead

PolyU's "anti-erasing" ink can be applied to food packaging to help combat tampering and ensure food security.

Non-erasable ink invented by PolyU researchers has led to large-scale economic, industrial and food safety benefits. In the past, China and many other countries faced a long-standing problem that put public health at risk – Information printed on food and drink packaging, such as expiry dates, was being tampered with. A new ink developed by PolyU researchers commissioned by an industry partner has not only overcome this problem, safeguarding consumers' health, but has also enabled the partner's business to make a multimillion-dollar annual profit.

Since 2011, Professor Li Pei of PolyU's Department of Applied Biology and Chemical Technology and her team of specialists in nanotechnology and advanced polymer materials have received full research support from the partner Hallyuen Holdings Ltd. It took them more than two years to develop successfully a nano ink formulation that could not be completely erased. When this "anti-erasing" ink is printed on multi-layered plastic packaging, it creates a double-layered, double-coloured mark. If the first layer is removed, it will leave trace marks that are highly resistant to chemical and physical stresses.

Thanks to Professor Li's untiring research efforts, Hallyuen founded a company to commercialise the ink, providing some of China's biggest food and beverage manufacturers, including Mengniu, with the ability to print tamper-proof expiry dates on packaging. Now the ink is being used to print 30 billion food and drink packages annually, helping to ensure food safety. Furthermore, the partner has been able to expand beyond the ink-related businesses to become a listed technology company.

Apart from the dairy manufacturers, other industries including cable and wire, and electronics are also applying the technology to tackle their specific issues. More types of ink, including ones that are resistant to oil, water, alcohol, and rubbing, have already been developed through the collaboration between the company and the PolyU team. They are now working on "smart ink" that can respond to UV light to further serve industries.

PolyU and Shenzhen Power Supply Bureau launch new innovation lab

PolyU's Department of Building Services Engineering (BSE) has joined forces with Shenzhen Power Supply Bureau to establish China's first lab combining grid systems and building electrical systems. The low voltage innovation laboratory platform was recently put into use in Shenzhen.

The laboratory, developed by BSE's Associate Head Professor Du Yaping, Professor Chen Mingli and their research team, is being operated by the Futian Power Supply Bureau of Shenzhen in cooperation with the Department. It will enable the Shenzhen Power Supply Bureau and the China Southern Power Grid to conduct research and develop their own intelligent power distribution equipment independently, as well as address various safety issues in relation to the distribution and utilisation of electricity. The research team will also work on related safety issues using the facilities in the laboratory.

GBA Startup Postdoc Programme nurtures technopreneurs

PolyU is a pioneer in promoting entrepreneurship in Hong Kong and has put in place a variety of initiatives to foster innovation and entrepreneurship among students. Alongside offering seed grants, incubation and acceleration support, it has also launched the GBA Startup Postdoc Programme to help recent PhD graduates become technopreneurs, turning their research outcomes into innovations with real-world impact through technology ventures.

Participants in the Programme receive entrepreneurship training and are encouraged to take part in high level entrepreneurial events and competitions to increase their experience. Two teams from the GBA Startup Postdoc Programme recently won Gold Awards at the 6th China International College Students' "Internet+" Innovation and Entrepreneurship Competition hosted by the Ministry of Education.

The two winning projects were "Development of micro-encapsulated probiotic products with fungal mycelia", led by Dr Chang Jinhui, and "Development of rapid molding production line for precision aspheric glass lens based on multi-function graphene-like coating technology", led by Dr Yu Ninghui. Dr Chang and Dr Yu are among the first cohort of PhD graduates admitted to the Programme in 2019.

Dr Chang Jinhui

Dr Chang's team was supervised by Dr Jimmy Jin, Assistant Professor, School of Accounting and Finance, and Professor Wing-tak Wong, Deputy President and Provost and Chair Professor of Chemical Technology at the Department of Applied Biology and Chemical Technology. Dr Li Qiang, an alumnus from the Faculty of Business, also supervised the team from an industry perspective.

"Our technology can protect probiotics against damage from heat or pressure and enables different types of probiotics to be included in snacks, hot drinks and pet food to provide health benefits. Through the project, we have discovered a new way to provide an environment that increases the percentage of a potential probiotic, namely Akkermansia, in the gut, helping people to lose weight and reduce obesity," Dr Chang said.

Dr Yu Ninghui

Dr Yu's team was supervised by Professor W.B. Lee, Emeritus Professor of the Department of Industrial and Systems Engineering. It successfully developed a molding technology based on a graphene-like composite for the production of high-precision aspherical glass lenses. Dr Yu said: "An aspheric glass lens offers better imaging quality and a simplified optical system, and thus has obvious advantages over traditional plastic lenses. Compared to existing technology, the new technology will lower the manufacturing cost of a lens by 65%."

About PolyU's GBA Startup Postdoc Programmee

Launched in 2019 as a pilot run, the Programme aims to transform recent PhD graduates into technopreneurs and translate their research outcomes into innovations with real-world impact through technology ventures. The 24-month programme, the first of its kind in Asia, covers entrepreneurship courses, applied research and pre-incubation. The Programme welcomes applications from recent PhD graduates globally.

Successful candidates will receive a monthly salary, access to the University's research facilities, government grants and start-up subsidies. Entrepreneurship training as well as dual academic and business supervision will also be provided to support the commercialisation of their research outcomes through technology start-ups in the Greater Bay Area (GBA). The Programme is developed and managed by PolyU's Institute for Entrepreneurship.

(From left) Mrs Laura Cha, Professor Xu Ningsheng and Professor Zhong Nanshan

Three distinguished individuals conferred honorary doctorates by PolyU

The Hong Kong Polytechnic University will confer honorary doctorates on three distinguished persons in recognition of their outstanding achievements in the fields of finance, scientific research, education and public health as well as their remarkable contributions to society. They are (in alphabetical order of surname): Mrs Laura Cha, Professor Xu Ningsheng and Professor Zhong Nanshan.

Mrs Laura Cha, GBM, GBS, JP, is the Chairman of Hong Kong Exchanges and Clearing Limited, Non-executive Chairman of The Hongkong and Shanghai Banking Corporation Limited and Director of the World Federation of Exchanges. She is also a Non-Official Member of the Executive Council of the Hong Kong Special Administrative Region. Mrs Cha was the first non-Mainland resident to join the Central Government at vice-ministerial rank when she served as Vice Chairman of the China Securities Regulatory Commission from 2001 to 2004. She has made impactful contributions to the development of the financial services sector in both Hong Kong and Mainland China.

Professor Xu Ningsheng is President of Fudan University and former President of Sun Yat-sen University, China. He is a Member of the Chinese Academy of Sciences, Academician of the Academy of Sciences for the Developing World and a Member of the 13th National Five-year Plan National Expert Committee. Over the years, he has made significant contributions to the development of the Nation, especially in the areas of education and research.

Professor Zhong Nanshan is Professor of Medicine at the Guangzhou Medical University, Director of the State Clinical Research Centre of Respiratory Disease, Member of WHO's Technical Advisory Group on COVID-19 Preparedness and Response, and Academician of the Chinese Academy of Engineering. Renowned for his achievements in fighting epidemics, Professor Zhong has made enormous contributions in leading the Chinese medical team to combat SARS in 2003. He is also instrumental in stopping the spread of COVID-19 in the Mainland.

PolyU Council Chairman Dr Lam Tai-fai extended his congratulations on behalf of the University to the three recipients. He said, "We are very excited to welcome them as new members of the PolyU family. Their extraordinary accomplishments, as well as their selfless and outstanding contributions to society deserve our utmost respect. We look forward to working closely with them for the continued advancement of PolyU in Hong Kong and Mainland China, contributing to the future development of Hong Kong and our Nation."

Professor Jin-Guang Teng, PolyU President, stated, "The devotion of the recipients to improving people's lives and helping society to progress is highly motivational, encouraging all of us at PolyU to face the challenges and strive for breakthroughs in nurturing talent, pushing forward the frontiers of knowledge and technology, as well as serving our society to foster a much better tomorrow."

PolyU rises in global rankings

Best Universities in Asia 2021 by the U.S. News & World Report

20th

QS Asia University Rankings 2021

25th

THE World Reputation Rankings 2020

126th–150th

Rankings by Subject

Times Higher Education (THE) World University Rankings by Subject 2021

Business and Economics	29th
Engineering and Technology	75th
Computer Science	79th
Social Sciences	82nd

Best Global Universities 2021 by the U.S. News & World Report

Civil Engineering	3rd
Engineering	12th
Mechanical Engineering	15th

The University's pursuit of academic excellence has been recognised in recently released world university rankings.

In the Times Higher Education (THE) World University Rankings by Subject 2021, PolyU was ranked in the top 100 globally in four disciplines – 29th in Business and Economics, 75th in Engineering and Technology, 79th in Computer Science, and 82nd in Social Sciences. The league table ranked more than 1,500 universities from around the world according to five indicators, including their teaching and learning environment as well as research volume and reputation.

PolyU was also listed in the THE World Reputation Rankings for the first time, placing in the 126th-150th range. This exercise ranks universities around the globe based on responses to the world's largest invitation-only opinion survey, which asks senior and published academics to name no more than 15 universities that they consider to be the best for research and teaching in their field.

Meanwhile, in the QS Asia University Rankings 2021, PolyU came 25th out of the top 500 universities in Asia. The rankings were based on 11 criteria, including academic reputation, employer reputation, and international research work.

Separately, in the 2021 edition of the Best Global Universities rankings released by the U.S. News & World Report, PolyU was ranked 20th in Asia. In terms of subject rankings, Civil Engineering led the way being ranked 3rd globally, followed by Engineering and Mechanical Engineering, which were placed 12th and 15th respectively. The Best Global Universities rankings are based on 13 indicators, including global and regional research reputation, the number of publications that are among the 10% most cited, and the normalised citation impact of publications.

PolyU will reference these rankings to identify areas for continuous improvement in order to further elevate its performance in education and research. Through the concerted efforts of members of the University, PolyU strives to make further advancements to remain competitive among leading academic institutions.

President Teng (second from left) thanks the support from Mrs May Tam (second from right), Dr Lawrence Li, PolyU Deputy Council Chairman (left), and Dr Katherine Ngan, Chairman of the University Court and Chairman of PolyU Foundation (right)

PolyU launches first university-run occupational therapy clinic on campus

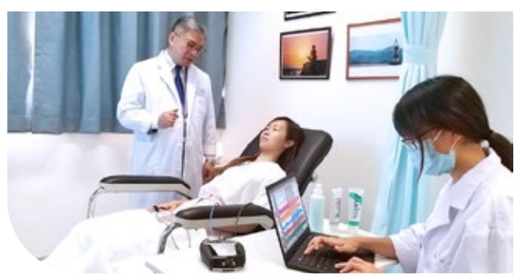
PolyU has established a new on-campus rehabilitation centre, the Tam Wing Fan Rehabilitation Service Centre (Occupational Therapy), with a generous donation from Mr Tam Wing Fan and his family. It is the first occupational therapy (OT) clinic in Hong Kong to be operated by a university.

The newly opened facility, named after the distinguished Hong Kong architect and philanthropist Mr Tam Wing Fan, is the second rehabilitation centre operating on PolyU's campus. At the Appreciation Ceremony to mark the launch of the Centre, Mrs May Tam said people's wellbeing had always been in her and Mr Tam's heart, and they were very pleased to collaborate with PolyU to help bring comfort and relief to all those who were suffering pain. The University started operating its first rehabilitation centre in 1993 which focuses on the provision of physiotherapy services.

The demand for rehabilitation services in Hong Kong is expected to increase substantially in the future due to the ageing population and the rising needs for primary healthcare services in the community. The Centre, which is being managed by PolyU's Department of Rehabilitation Sciences, will act as a service point for people of all ages, with an emphasis on elderly care, offering treatments for common neurological diseases, musculoskeletal disorders, falls and fractures in elderly people, and mental health conditions.

With state-of-the-art equipment, veteran academic researchers and experienced occupational therapists, the Centre will also be a platform for knowledge transfer, enabling PolyU experts to transform their pioneering research into clinical applications. In addition, it will serve as an important base for clinical education for PolyU's OT students and inbound OT exchange students.

Professor Jin-Guang Teng, President of PolyU, extended his heartfelt gratitude to Mr and Mrs Tam at the ceremony. He said: "Over the past 40 years, PolyU has nurtured more than 6,000 occupational therapists and physiotherapists. Many of them are now working in the healthcare industry and contributing to the wellbeing of Hong Kong people. Through this Centre, PolyU will continue to serve the Hong Kong community with steadfast dedication, thereby upholding Mr Tam's belief in compassionate love."



PolyU wins funding from HKJC Charities Trust to help families develop resilience

Disagreements arising from social unrest and anxiety caused by the COVID-19 pandemic and its associated economic downturn have made families in Hong Kong more vulnerable to stress. To help families be more resilient, a multidisciplinary team led by Dr Janet Leung Tsin-yee, Associate Professor of PolyU's Department of Applied Social Sciences (APSS), and Professor Daniel T. L. Shek, PolyU's Interim Vice-President (Research and Innovation) and Chair Professor of Applied Social Sciences and Li & Fung Professor in Service Leadership Education at APSS, will collaborate with several NGOs to run a three-year project funded by The Hong Kong Jockey Club Charities Trust.

The Trust has generously allocated HK$38.825 million for the whole project, of which HK$18.9 million has been awarded to PolyU. The pioneering project aims to promote coping strategies among families to help them overcome external challenges. It will also share positive family belief systems, and work to improve mutual understanding and support among family members, so that families are better able to protect each other from threats and vulnerabilities.

PolyU will contribute to the design and implementation of online educational programmes and family activities for the project, and work with the participating NGOs to develop community-based intervention programmes. The University will also design and implement capacity-building workshops for social workers, teachers, psychologists and health professionals, and conduct a needs assessment study and evaluation research.

Lee Hysan Foundation supports PolyU's healthy spine project

PolyU is launching a three-year "Healthy Spine Project" funded through a generous donation from Lee Hysan Foundation, a strategic partner and sponsor of the University. The project involves the development and community application of non-surgical treatment for adolescents aged between 10 and 15 years old with mild to moderate adolescent idiopathic scoliosis (AIS).

AIS is an abnormal curvature of the spine that appears in late childhood or adolescence. In Hong Kong, AIS is the third most common health problem among students. Up to 2.5% of the local adolescent population suffers from AIS, almost double the global prevalence rate of 1.34%. Early intervention is crucial to prevent further deterioration of the spine, however, existing interventions impose restrictions on patients' mobility.

The "Healthy Spine Project" was launched to overcome this problem. A multi-disciplinary team led by Dr Joanne Yip, Associate Professor of PolyU's Institute of Textiles and Clothing and Associate Dean of the Faculty of Applied Science and Textiles, collaborated with researchers from the University of Hong Kong and the Chinese University of Hong Kong to develop products offering more effective treatment for AIS.

The project will provide AIS screening for 4,500 students and early non-surgical intervention for 110 students with mild to moderate AIS, using three different medical garments recently developed in Hong Kong. The garments are designed to be functional and wearable, combining advanced textile and garment technologies with the innovative use of sensors to treat patients. A pre-clinical trial of the garments will be conducted in the community, after which they will be commercialised to provide a more viable way for AIS sufferers to treat their condition.

PolyU's newly developed smart tank top which helps rectify spinal problem in adolescents

PolyU receives Areas of Excellence Scheme funding to develop novel meta-materials and meta-devices

PolyU has been awarded funding from the Areas of Excellence (AoE) Scheme 2020/21 (Ninth Round) of the Research Grants Council (RGC) in recognition of its research strengths.

The University will lead the "Meta-optics, Meta-acoustics and Meta-devices" project, one of four projects allocated funding by the RGC. The project has a HK$70 million budget, HK$65 million of which will come from the RGC, with the remaining amount contributed by PolyU and other collaborating universities. Professor Tsai Din-ping, Chair Professor of Nanophotonics and Head of Department of Electronic and Information Engineering of PolyU, will lead the project.

The project aims to develop novel meta-materials and meta-devices that can control and manipulate electromagnetic and acoustic waves. These new meta-devices can be used for novel applications in areas such as imaging, sensing, energy, communications, biomedicine, industrial manufacturing, artificial intelligence technology and quantum technology.

Professor Tsai said: "We expect this project will generate a new platform for intelligent artificial materials and devices with low energy consumption that are compatible with advanced manufacturing in micro- and nano-electronics industrial techniques for wearable or portable innovations. The intellectual property and innovations of the meta-devices will also be transferred to industry and business sectors. We believe the new knowledge will strategically transform and upgrade Hong Kong's hi-tech industries."

Professor Jin-Guang Teng, President of PolyU, said: "I would like to express my gratitude on behalf of the University for the RGC's strong support of our research. Through our interdisciplinary research, we are dedicated to expanding human knowledge, addressing societal needs and making a positive impact on the world."

PolyU is also participating in two other projects, namely "Aging, Skeletal Degeneration and Regeneration" and "2D Materials Research: Fundamentals Towards Emerging Technologies" led by The Chinese University of Hong Kong and the University of Hong Kong respectively. The approved budget for these two projects is HK$163 million. The total budget for all four selected projects in the ninth round of funding exceeds HK$304 million.

> We believe the new knowledge will strategically transform and upgrade Hong Kong's hi-tech industries.

PolyU's Service-Learning initiative wins international award

PolyU students using their professional knowledge to serve the needy through Service-Learning projects

PolyU was honoured to receive the 2020 International Research Award from the International Association for Research on Service-Learning and Community Engagement (IARSLCE) for its Service-Learning (SL) pedagogy. IARSLCE said the programme was "one of the world's most impressive and impactful service-learning initiatives in higher education".

PolyU piloted the programme in the 2011/12 academic year, as a compulsory component for undergraduates, providing students with opportunities to apply their professional knowledge to help those in need and learn from the experience. Through SL projects, PolyU creates positive impacts on the lives of the many beneficiaries. The University has built up long-term SL collaborations with partners in more than 10 countries and regions, including Cambodia, Hong Kong, Indonesia, Kazakhstan, Kyrgyzstan, Mainland China, Myanmar, Rwanda and Vietnam.

The SL programme is facilitated by PolyU's Service-Learning and Leadership Office (SLLO), which connects teachers and students with community organisations, explores service sites and helps to design innovative projects. It also assesses service risks, supervises students, and conducts research on SL.

Dr Grace Ngai, Head of SLLO, is delighted that the University's SL efforts have been recognised internationally. "After a decade of hard work, we are thrilled that PolyU is hailed as a leader in the development of best practice in international SL projects. We have created exceptionally high quality and impressive impacts for the participating students as well as for the international community," she said.

Through SL experiences, students learn to tackle complex issues and come up with viable solutions. Projects have ranged from installing solar panels to generate electricity and setting up water filtration systems, to performing eye examinations and teaching STEM for hundreds of children. This experiential learning pedagogy that integrates community service with academic study and reflection has a strong positive influence on PolyU students' academic, civic, social, moral and personal development.

Since the launch of the programme, about 25,000 PolyU students have provided 976,000 hours of services to the communities in Hong Kong and overseas.

Dr Stephen Chan, the founding Head of SLLO's predecessor the Office of Service-Learning, remarked, "We are proud of the development and success of the programme at PolyU, which now offers more than 60 SL subjects taught by 170 teachers from 26 departments to more than 4,000 students each year."

PolyU also shares its strengths in organising SL programmes with others in the field. For the benefit of its international collaborators, PolyU has documented and analysed critical factors for continuous improvements to the programme. Moreover, the University has advanced research on SL through actively publishing research papers and editing books on the topic. It also shares its extensive experience through journal articles, conferences, student exchange and training workshops.

PolyU scholar wins Hong Kong Humanity Award 2020

Professor George Woo, Emeritus Professor and Senior Advisor at PolyU's School of Optometry and former Dean of the Faculty of Health and Social Sciences, believes that with timely support people with suicidal tendencies could be saved.

This conviction has motivated Professor Woo to serve with The Samaritans for nearly two decades, working as a hotline volunteer at its centre since 2002, and as its Chairman of the Board of Directors from 2015 to 2019. His devotion to helping people in emotional distress made him one of the awardees of the Hong Kong Humanity Award 2020.

The Award, which is jointly organised by the Hong Kong Red Cross and Radio Television Hong Kong, is given to individuals who have made outstanding humanitarian contributions in three core areas: protection of human life, care for the health of the vulnerable, and respect for human dignity.

Professor Woo is often dubbed the father of optometry in Hong Kong. He studied optometry and physiological optics in Canada and the US. After coming back to the city in the 1980s, he founded the Department of Diagnostic Sciences at the then Hong Kong Polytechnic (the predecessor of PolyU) to promote the development of optometry in Hong Kong.

"When I worked as an optometrist, I realised there were a lot of emotional traumas which we can't see with our eyes," Professor Woo said. "When people were diagnosed with severe vision loss that even surgery and medicine couldn't help, many of them could not accept the reality. They often suffer from depression and developed suicidal thoughts," he explained.

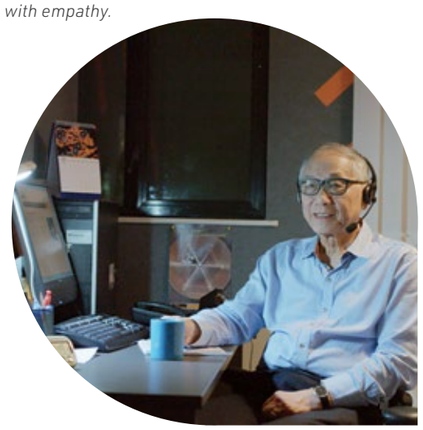
Professor Woo remembered meeting an anesthesiologist who lost his vision because of diabetes. "He wanted to commit suicide. I spent a lot of time comforting him during this immensely challenging phase of his life." Ultimately, he abandoned the idea of killing himself. Since then, Professor Woo has aspired to provide support to other emotionally distressed people.

Professor Woo also recalled that many years ago, a colleague and her husband sadly committed suicide due to her pain and suffering from cancer. The tragedy was a personal reminder of the importance of providing timely support.

Despite being aged 79, Professor Woo still works overnight answering calls at the Samaritans' hotline centre. "Those who call us for help are usually having a very hard time. We listen to their concerns with empathy and patience. By understanding their worries, I hope I can walk them through the darkest period of their lives," he said. "We should try our best to protect every precious life."

Big-hearted and well-respected, Professor Woo dedicates his knowledge, time and efforts to not only treating patients who have lost much of their eyesight, but also curing wounds invisible to the eye.

As a hotline volunteer at The Samaritans, Professor Woo listens to callers' concerns with empathy.



Twelve PolyU academics recognised among the world's most highly cited researchers

Twelve scholars from PolyU have been acknowledged in the Highly Cited Researchers 2020 list by Clarivate. The list identifies the most influential scholars around the world during the past decade, as demonstrated by their publication of multiple highly-cited papers that rank in the top 1% by citations for field and publication year in the Web of Science index between 2009 and 2019. Approximately 6,200 researchers from more than 60 countries and regions are recognised in the 2020 list for their performance in specific field or cross-field.

PolyU, a world-class research university, is committed to achieving research excellence while bringing together top-tier scholars in various disciplines.

The 12 PolyU researchers featured in the list, and the fields in which they have been recognised, are as follows:

Computer Science
Professor Guo Song
Department of Computing

Engineering
Professor David Zhang
Department of Computing

Cross-Field
Professor Wong Wai-yeung
Department of Applied Biology and Chemical Technology

Engineering
Professor Yang Hong-xing
Department of Building Services Engineering

Cross-Field
Professor Lee Shun-cheng
Department of Civil and Environmental Engineering

Environment and Ecology
Dr Daniel Tsang
Department of Civil and Environmental Engineering

Cross-Field
Professor Tsai Din-ping
Department of Electronic and Information Engineering

Materials Science
Professor Li Gang
Department of Electronic and Information Engineering

Engineering
Professor Chau Kwok-wing
Department of Civil and Environmental Engineering

Mathematics
Professor Qi Li-qun
Department of Applied Mathematics

Engineering
Professor Zhang Lei
Department of Computing

Social Sciences
Professor Rob Law
School of Hotel and Tourism Management

Four researchers win grants from China's Excellent Young Scientists Fund

Four scientists at PolyU have been awarded funding from China's Excellent Young Scientists Fund 2020. The fund supports young scientists who have made significant contributions in fundamental research, helping them become leading international scholars in their field. Each scientist will receive RMB1.2 million to support their work in Hong Kong over a three-year period.

Under the National Natural Science Foundation of China, the Fund was extended to young scientists, defined as men aged below 38 and women aged below 40, in Hong Kong and Macau at eight designated universities in 2019. A total of 25 young scholars from Hong Kong and Macau are awarded funding annually.

The successful PolyU researchers and their projects are:

Dr An Liang
Associate Professor,
Department of Mechanical Engineering

Flow and Heat/Mass Transfer in Electrochemical Energy Systems
Dr An has systematically studied the characteristics of flow and mass transport in a complex microporous structure in which electrochemical reactions occur, achieving a number of innovative results.

The primary objective of this project is to investigate key issues relating to flow and heat/mass transfer in electrochemical energy systems at different scales.

Dr Ray Yang Lei
Assistant Professor,
Department of Computing

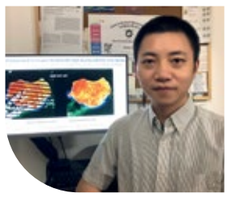
Battery-free Internet of Things
This project explores the possibility of creating an efficient and large-scale battery-free Internet of Things (IoT), which aims to harvest energy from ambient electromagnetic waves for wireless communication and sensors.

It will contribute to the key theory and technologies of new generation IoT, facilitating the coexistence and fusion of multi-protocols, multi-target and multi-networks, and promoting their application in industry.

Dr Zhou Chao
Assistant Professor,
Department of Civil and Environmental Engineering

Unsaturated Soils and Problematic Soils
This project aims to improve the fundamental understanding and modelling capability of the behaviour of unsaturated loess under cyclic thermo-hydro-mechanical loads.

The findings of this project will help engineers improve the design of pavement and railway embankments in areas with high loess deposits.



Dr Zhu Xiaolin
Assistant Professor,
Department of Land Surveying and Geo-Informatics

Remote Sensing: Time Series Image Processing
Dr Zhu has developed a series of advanced technologies for processing satellite images, which improves the ability and accuracy of time-series remote sensing for monitoring land surface changes.

This project will further develop the framework and model for multi-dimensional data fusion, a technology that will be needed in the near future to integrate data from multiple satellites.

It is encouraging to see young scientists from PolyU supported by the Nation to further develop their research. The provision of the Fund not only reflects the Nation's support of Hong Kong's scientific research, but also encourages young local scientists to pursue excellence in both basic research and research in cutting-edge technologies.

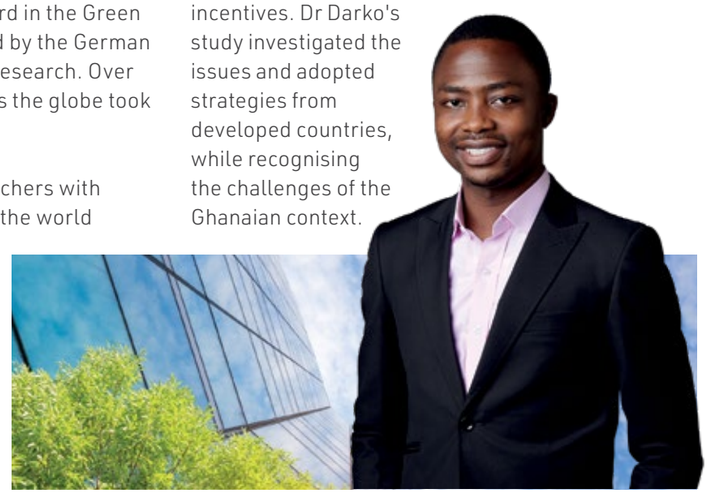
Young researcher honoured with Green Talents Award

Dr Amos Darko, a PhD graduate and currently a Research Assistant Professor of PolyU's Department of Building and Real Estate, was honoured with a Green Talents Award in the Green Talents Competition 2020 organised by the German Federal Ministry of Education and Research. Over 580 talents from 87 countries across the globe took part in the competition.

The award, granted to young researchers with outstanding contribution in making the world more sustainable, recognises Dr Darko's accomplishments in adopting and promoting green building technologies in developing countries.

Dr Darko successfully mapped out a novel "Implementation Strategy" in his PhD research.

In Ghana, a developing country and Dr Darko's home country, green building technologies adoption is often hindered by high costs and lack of government incentives. Dr Darko's study investigated the issues and adopted strategies from developed countries, while recognising the challenges of the Ghanaian context.



School of Nursing re-designated as WHO Collaborating Centre

The World Health Organization (WHO) has re-designated PolyU's School of Nursing as a WHO Collaborating Centre (WHO CC) for Community Health Services until 2023.

Officiating at the re-designation ceremony, which was held online, were Professor Sophia Chan, Secretary for Food and Health of the HKSAR Government, and Dr Hiromasa Okayasu, Coordinator, Healthy Ageing Data, Strategy and Innovation of the WHO Regional Office for the Western Pacific. Professor David Shum, Dean of PolyU's Faculty of Health and Social Sciences and Yeung Tsang Wing Yee and Tsang Wing Hing Professor in Neuropsychology; Professor Alex Molasiotis, Head of the School of Nursing and Director of the WHO CC for Community Health Services; and Dr Angela Leung, Deputy Director of the Centre, also attended the ceremony.

Established in 2007, the Centre is the only WHO CC in Healthy Ageing in Asia Pacific.

(Clockwise from top left) Professor Alex Molasiotis, Professor Sophia Chan, Dr Angela Leung and Dr Hiromasa Okayasu at the online re-designation ceremony.

The Centre will develop a series of work plans, including collaborative research projects, roundtable sessions and training workshops on healthy ageing, in response to the WHO's Decade of Healthy Ageing during the designation period. The Centre will also draw upon the expertise within the University and set up collaborations to make a positive difference to health services in the community.

PolyU members on 2020 Honours List

Congratulations to the following 28 members of the PolyU community who have been honoured with awards or appointed Justices of the Peace by the HKSAR Government in recognition of their significant contributions to Hong Kong.

The Hon. Ma Fung-kwok, GBS, JP

Dr Dennis Ng Wang-pun, SBS, MH

Professor John Chai Yat-chiu, BBS, JP

Gold Bauhinia Star	
The Hon. Ma Fung-kwok, GBS, JP	Alumnus, Department of Civil and Environmental Engineering

Silver Bauhinia Star	
Ms Chan Oi-ching, SBS, JP	Senior Member of PolyU Foundation (Organisation member)
Ms Pansy Ho Chiu-king, SBS, JP	Former Court Member
Dr Dennis Ng Wang-pun, SBS, MH	University Fellow
Dr Woo Wai-man, SBS	Ordinary Member of PolyU Foundation (Individual member)

Bronze Bauhinia Star	
Professor John Chai Yat-chiu, BBS, JP	University Fellow
Dr Kenneth Chu Ting-kin, BBS	Honorary Life Chairman of PolyU Foundation (Organisation member)
Dr Margaret Lee Wai-lai, BBS	Life Member of PolyU Foundation (Organisation member)
Ms Eileen Tsui Li, BBS, JP	Ordinary Member of PolyU Foundation (Individual member)

Hong Kong Fire Services Medal for Meritorious Service	
Mr Kavin Chiu Wai-kin	Alumnus, Faculty of Construction and Environment

Medal of Honour	
Dr Edward Chan Kwok-man, MH	University Fellow and CEO Club President
Dr Andrew Cheng King-hoi, MH	Ordinary Member of PolyU Foundation (Individual member)

Chief Executive's Commendation for Community Service	
Dr Jonathan Chen Hon-kwan	Alumnus, School of Nursing
Mr Clarence Cheung Che-kong	Ordinary Member of PolyU Foundation (Organisation member)
Ms Yvette Lai Wai-man	Alumna, School of Nursing
Mr Lin Cheuk-fung	Ordinary Member of PolyU Foundation (Individual member)
Mr Thomas So Chau-ming	Alumnus, Faculty of Engineering
Mr Tang Jing-jung	Project Fellow, Department of Industrial and Systems Engineering
Dr Miranda Yau Chong-yee	Alumna, Faculty of Health and Social Sciences Adjunct Assistant Professor, Department of Health Technology and Informatics
Mr Yu Wai-chun	Alumnus, School of Professional Education and Executive Development
Dr Yuen Pak-leung	Alumnus, Department of Mechanical Engineering

Chief Executive's Commendation for Government/Public Service	
Ms Pauline Ho Wai-luen	Alumna, Department of Industrial and Systems Engineering
Mr Kwong Tsz-for	Alumnus, Department of Management and Marketing
Ms Winnie Shiu Wai-yee	Alumna, Department of Land Surveying and Geo-Informatics
Mr Danny Yeung Cheuk-man	Alumnus, Department of Computing

Justice of the Peace	
Ms Sabrina Chao Sih-ming, JP	Honorary Life Member of PolyU Foundation (Organisation member)
Dr Ko Pui-shuen, BBS, JP	Honorary Life President of PolyU Foundation (Organisation member)
The Hon. Tony Tse Wai-chuen, BBS, JP	Alumnus, Department of Building and Real Estate

Design students showcase creativity through 3D virtual show

The PolyU Design Degree Show 2020 showcases the creativity of our design students, including the award-winning project Asit by graduate Hui Hang-tat.

The PolyU Design Degree Show 2020, which showcased around 150 student projects covering bachelor's, master's and doctoral degree programmes in a wide range of disciplines offered by the School of Design, took place online due to COVID-19. The show enabled 3D virtual viewing of physical exhibits, an experience unique among the world's top design schools. Work exhibited included projects from Advertising Design, Communication Design, Environment and Interior Design, Social Design, Product Design, Digital Media, Interactive Media, Design Practices, Interaction Design, International Design and Business Management, Multimedia and Entertainment Technology programmes, as well as work from the Urban Environments Design programme.

Professor Kun-Pyo Lee, Dean of the School of Design, said: "The Show offers an invaluable opportunity to employers seeking the best designers. It enlightens the public by showing them world-class design, and inspires secondary school students to pursue a career in design."

Among the creative work on display was *Asit*, a future double-decker compartment designed to enable elderly and disabled people to travel safely. The designer Hui Hang-tat, a graduate of the BA(Hons) in Product Design programme, was named the National Winner at the James Dyson Award 2020 (Hong Kong). Other designs included a mobile game for improving intergenerational relationships and a planter solution for sustainable living in densely populated areas.

3D-printed snaker spoons help people with special needs

A team of PolyU occupational therapy students won the Gold Award in the Design Category of the Global Student Innovation Challenge of i-CREATe 2019 for their innovative spoon. The "Snaker Spoon" can be twisted with different angles in three planes so that people with upper limb disabilities can adjust it according to their needs, enabling them to feed themselves independently. Although the students have graduated, their idea has still been turned into a product by the University.

"We believe this device can benefit many people with disabilities, and that there will be great value in kicking off for production rather than staying in the prototyping stage," Professor Kenneth Fong, supervisor of the student team and Programme Leader of the BSc (Hons) in Occupational Therapy offered by the Department of Rehabilitation Sciences (RS), said.

So far, 200 Snaker Spoons have been produced using 3D printing technology through a collaboration between RS, Industrial Centre (IC) and the University Research Facility in 3D Printing (U3DP) at PolyU.

"We integrate 3D printing technology with other technologies and apply them as solutions for industrial applications," Mr Sidney Wong, Engineering Manager at IC and U3DP, said. "In this case of low-volume production of 200 pieces, using 3D printing technology has reduced the production time from two to three months to about three to four weeks."

The first batch of the spoons will be distributed free to NGOs when the COVID-19 pandemic is under control.

Both the spoon and the handle of the Snaker Spoon are twistable, enabling users with upper limb disabilities to adjust the angle of the spoon to suit their individual needs when they eat.

CENTENARIAN ALUMNUS

shares fond memories of his ties with PolyU

HAPPY 100th BIRTHDAY

Congratulations to Mr Cheung Tsang-wai, the oldest alumnus of PolyU, who will celebrate his 100th birthday in March 2021.

When the University's predecessor Government Trade School (the School) was founded in 1937, Mr Cheung was among the first cohort of students who enrolled to study mechanical engineering. Eighty years after his graduation, Mr Cheung is still very supportive of his alma mater and loves to participate in events organised by PolyU.

Born in 1921, the centenarian, who graduated in December 1940 with a Diploma in Automobile Engineering, still has vivid memories of his student life. "The School was a red-brick three-storey building on Wood Road, Wanchai. Classes for mechanical engineering were held on the ground floor," he said.

Fond memories as the first-generation of alumni

The School represents PolyU's humble beginnings. When the School was founded in the 1930s, it had only three academic departments offering courses in marine wireless operating, mechanical engineering and building construction. "In my days, the School ran three classes only, with 20 students in each class, and the tuition fee was HK$5 per month. At that time, monthly rent for a room was about HK$8, while a rickshaw ride from Wanchai to Central cost about 50 cents," Mr Cheung said. Back in those days, when technical education was still dominated by men, all of the students were male.

Mr Cheung said mechanical engineering students like himself needed to attend lectures in automobile construction, mechanics and machine drawing. "I took practical courses in lathe-making, milling, automobile maintenance and overhaul, and welding as well," he added. During the summer, students of the School worked as interns at places such as Taikoo Dockyard and Whampoa Dock.

His fond memories of the School have not faded, and Mr Cheung can still recall many details from his time as a student. "Most of the teachers were expatriates. And all classes were given in English, no matter whether they were taught by foreign or Chinese teachers. As there were no textbooks at that time, we relied on the notes we jotted down during classes for revision," he said.

"The School only had dozens of students at a very small campus. Before attending practical classes, students would change into overalls in the changing room. Therefore, students from different classes got to know each other in the changing room," he added.

Mr Cheung (third from right) visited the PolyU campus with other older alumni in 2009.

Developing closer ties with his alma mater over time

Mr Cheung became a car repair and maintenance technician after his graduation in 1940. "During the Japanese occupation of Hong Kong between 1941 and 1945, people took whatever jobs they could find. Some of my classmates fled to Mainland China to work in the transport industry. I stayed in Hong Kong with my family and managed a team of government vehicle repair workers for a while before moving to Macau," he recalled. In Macau, Mr Cheung worked in the shipbuilding industry, supervising vessel maintenance work.

"To make a living, I even once worked at a currency exchange shop during the war," he added. After World War II ended, Mr Cheung came back to Hong Kong and took up different kinds of work, including as a car and ship mechanic, applying the skills he learned at the School. He retired in the mid-1970s.

For many years after his graduation, Mr Cheung continued to keep in contact with his classmates who had become close friends. He also followed PolyU's development. "I read the newspapers to keep up with PolyU's latest news," Mr Cheung said. He reconnected with PolyU in 2000 and participated in activities to celebrate the University's 65th anniversary in 2002. After this event, his ties with the University continued to strengthen. In the past two decades, he has been a regular at the bi-weekly lunch gatherings attended by older alumni. Mr Cheung, who is a keen photographer, also donated two photographs he took at Huangshan to the University for a charity auction.

Mr Cheung treasures friendship, pointing out that good friends always support each other. He also enjoys his regular lunches with other alumni on PolyU's campus, which has become a special place for them. "With its modern buildings and campus greenery, PolyU is always a beautiful place to me," he said.

Tips for longevity

Mr Cheung attributes his longevity to Tai Chi and Qigong, which he started practicing when he was 40 years old. He still spends one hour every day doing Tai Chi to help improve his flexibility and balance. Mr Cheung also emphasises the importance of staying mentally fit. He said: "I often recall the silly but happy moments of my life. Recalling them always makes me smile."

Having Mr Cheung among our alumni is a blessing for PolyU. He reflects the long history of PolyU which dates back to the Government Trade School (1937-1947), later evolving into Hong Kong Technical College (1947-1972) and Hong Kong Polytechnic (1972-1994) before becoming The Hong Kong Polytechnic University of today. As he celebrates his 100th birthday, we wish Mr Cheung good health and happiness.

> In my days, the School ran three classes only, with 20 students in each class, and the tuition fee was HK$5 per month.

The ingredients for success of a

FORBES CHINA 2020 LEADER

Dr Li Siyang

- Bachelor of Engineering, South China University of Technology, Guangzhou (2008-2012)
- PhD in Electrical Engineering, PolyU (2013-2018)
- Cofounder & CEO, Goal Technology (Shenzhen) Co., Ltd.

What Dr Li Siyang has achieved by the age of 30 is remarkable. He was selected by *Forbes China 2020* as one of the 300 elite entrepreneurs and leaders for its "30 Under 30" list in the "Industry, Manufacturing, Energy and Environmental Protection" category. The prestigious "30 Under 30" China list identifies rising stars in China in 20 different fields for their contributions as leaders and innovators.

In 2018, Dr Li co-founded Goal Technology (Shenzhen) Co., Ltd., which specialises in producing high-precision manufacturing equipment and motors. Before opening his first business venture in Shenzhen, Dr Li earned a PhD at PolyU's Department of Electrical Engineering (EE), studying at the University between 2013 and 2018.

Dr Li focused on conducting high-level research in green technology under his PhD supervisor Professor Eric Cheng, Director of EE's Power Electronics Research Centre. Dr Li used the opportunity to broaden his knowledge in areas such as solar power generation, solar automatic tracking systems, linear rotating motors and permanent magnet synchronous motors. "At PolyU, I met so many talented people who worked together for the same goal of achieving excellence," Dr Li said.

Dr Li aspired to start his own business while he was still a PhD student. Professor Cheng recalled: "Siyang exhibited a very strong entrepreneurial spirit during his PhD studies. Besides conducting top-notch research, he spent considerable time understanding the strengths and weaknesses of different manufacturing products, and was keen to find out what made a product successful in China's market."

Crafting high-precision equipment to meet industry needs

The successful entrepreneur remembers being keen to break into China's manufacturing industry during his time at PolyU. "I always asked myself what type of products China's industry was lacking. I founded Goal Technology with the vision of filling these gaps and taking China's manufacturing industry to the next level," he said.

"China's manufacturing industry has long been over-reliant on imports. Mainland suppliers are weak in making high-precision products. That's why many manufacturers need to import expensive equipment from abroad to produce the components they require for their own products," Dr Li explained.

To address these market needs, Goal Technology positions itself as an innovative enterprise producing laser processing and marking equipment, and high-precision linear rotary motors. Dr Li also set up an R&D division at the company, the Goal Technology's Research Center, which hired several PolyU graduates, to help achieve this aim.

Developing a research-driven spirit to overcome challenges

"Several of my PhD classmates graduating from EE are either doing full-time research work here at the Center or serving as our consultants. Our in-house and consultancy researchers hold regular discussions to brainstorm new ideas," Dr Li said.

The Goal Technology's Research Center now employs almost 50 staff. Having its own sizable research team reflects Dr Li's emphasis on building up his company's research strengths for its long-term strategic development. "The short-term goal of Goal Technology is to produce the best high-precision linear rotating motors in the market for use in semiconductors, display panels, 3C-automation and medical equipment," he said.

Success did not come easily. When founding Goal Technology, Dr Li encountered difficulties securing funding for the initial setup of the company. He eventually found a large property developer interested in investing in his company. "This developer believed in the future of advanced technologies and shared our belief that China needed to strengthen its capacity in manufacturing high-end products using pioneering technology," Dr Li said.

Today, as the CEO of a high-flying company, Dr Li faces the pressure of ensuring Goal Technology continues to innovate and meet evolving market needs. His staff attend all the major industry exhibitions, forums and seminars on the mainland to help them understand the latest market trends. "We also have a strong social media team to promote our products and collect market information," he explained.

Dr Li Siyang (second from left) celebrates with his classmates on their graduation.

Persistence leads to success

Dr Li is thankful that he had the opportunity to study at PolyU. "It was challenging, but unforgettable. As my thesis relied on experimental testing of a product that I built and refined, I often worked night and day at the laboratory. I enjoyed exchanging ideas with other PolyU students and researchers there," Dr Li said.

Dr Li said Goal Technology's long-term goal is to make a difference in China's manufacturing sector by creating new advanced technologies that will change the industry. It is a mission that is likely to take many years to accomplish, but Dr Li is undaunted. In the meantime, the knowledge and skills he acquired during his time at PolyU help him overcome hurdles he faces in his entrepreneurial pursuits.

> Goal Technology's long-term goal is to make a difference in China's manufacturing sector by creating new advanced technologies that will change the industry.

Goal Technology's headquarters in Shenzhen

Major external appointments and awards of PolyU members

From September to December 2020, the following PolyU members were either appointed significant duties to share their scholarly expertise to benefit the wider community or had their academic efforts duly recognised. (listed in alphabetical order)

Dr Jörn Bühring
Assistant Professor, School of Design

Award
- Emerald Literati Award - Outstanding Paper 2020

Dr Daphne Cheung
Assistant Professor, School of Nursing

Award
- Distinguished Educator in Gerontological Nursing, National Hartford Center of Gerontological Nursing Excellence, US

Dr Amos Darko
Research Assistant Professor, Department of Building and Real Estate

Award
- Green Talents Award, Green Talents Competition 2020, German Federal Ministry of Education and Research

Professor Johan Hoorn
Professor, School of Design and Department of Computing

Award
- Huibregtsen Prize 2020

Professor Carly Lam
Professor, School of Optometry

Award
- 2020 SILMO d'Or Award (Vision)

Professor Francis Lau
Professor, Department of Electronic and Information Engineering

Award
- Fellow, Institute of Electrical and Electronics Engineers

Professor Daniel T.L. Shek
Chair Professor of Department of Applied Social Sciences
Li & Fung Professor in Service Leadership Education
Interim Vice President (Research and Innovation)
Associate Vice President (Undergraduate Programme)

Appointments
- Member, Board of Directors, International Positive Psychology Association
- Member, Electoral Affairs Commission

Professor Tao Xiaoming
Chair Professor of Textile Technology
Director, Research Centre for Smart Wearable Technology, Institute of Textiles and Clothing

Award
- 13th Guanghua Engineering Science and Technology Award, Chinese Academy of Engineering

Professor To Chi-ho
Head, School of Optometry
Chair Professor of Experimental Optometry
Henry G. Leong Professor in Elderly Vision Health

Award
- 2020 SILMO d'Or Award (Vision)

Professor Tsai Din-ping
Chair Professor of Nanophotonics & Head, Department of Electronic and Information Engineering

Award
- Fellow, National Academy of Inventors, US, 2020

Dr Wang Peng
Associate Professor, Department of Civil and Environmental Engineering

Award
- The Prince Sultan Bin Abdulaziz International Prize for Water (Category: Alternative Water Resources)

Professor Wen Chih-yung
Professor & Interim Head, Interdisciplinary Division of Aeronautical and Aviation Engineering

Award
- 2020 Highly Cited Paper of Applied Energy, Elsevier

Professor George Woo
Emeritus Professor and Senior Advisor, School of Optometry

Award
- Hong Kong Humanity Award 2020, Hong Kong Red Cross and Radio Television Hong Kong

Professor Yip Shea-ping
Professor & Head, Department of Health Technology and Informatics

Award
- Fellow, Royal Society of Biology

*Note: Please refer to stories on p.15-17, 30 and 31 for further information on the accolades received by other staff members.

Senior staff appointments and promotions
(between 1 October and 31 December 2020)

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

Promotions

Professor Wing-tak Wong
as Deputy President and Provost
on 1 December 2020

Dr Wai Hon-wah
as Director of Industrial Centre
on 1 December 2020

Appointments

Professor Tan Kay-chen
as Chair Professor of Computational Intelligence, Department of Computing
on 16 December 2020

Professor Christina Wong
as Associate Dean, Graduate School
on 15 December 2020

Dr Yip Yiu-wan
as Associate Dean, Faculty of Applied Science and Textiles
on 18 November 2020

Textile scientist wins

GUANGHUA ENGINEERING SCIENCE AND TECHNOLOGY AWARD

Professor Tao Xiao-ming

- BEng in Textile Engineering, East China Institute of Textile Science and Technology, 1982
- PhD in Textile Physics, University of New South Wales, 1987
- Joined PolyU in 1994 as Lecturer (College of Degree Studies), Institute of Textiles and Clothing
- Chair Professor of Textile Technology, 2002 - present
- Head, Institute of Textiles and Clothing, 2003 - 2011
- Director, Research Centre for Smart Wearable Technology, 2018 - present
- World President, The Textile Institute, 2007 - 2010

PolyU textile engineering expert Professor Tao Xiao-ming, Vincent and Lily Woo Professor in Textiles Technology, and Director of the Research Centre for Smart Wearable Technology, was honoured with the 13th Guanghua Engineering Science and Technology Award by the Chinese Academy of Engineering recently.

"I feel proud and deeply honoured to receive the national award. We, as scientists and close partners of the industry, will continue to leverage our strengths in research and development as well as the world's leading technologies to develop innovative solutions," Professor Tao said.

The prestigious award is the latest addition to the impressive collection of accolades received by Professor Tao, who has spent nearly three decades conducting research in intelligent fibrous materials, nanotechnology, photonic fibres and fabrics, flexible electronic and photonic devices, smart washable technology, yarn manufacturing and textile composites. Over the years, Professor Tao has published more than 800 scientific publications and her book *Smart Fibres, Fabrics and Clothing*, published in 2001, was the first book written on the topic.

Professor Tao's parents (first and second from left) played a pivotal role in igniting her interest in science and technology at an early age.

Born and raised in the city of Yangzhou in Jiangsu province, Professor Tao's interest in science was ignited at an early age thanks to a gift from her parents. "They gave me a book called *The twentieth century as described by scientists* when I was a primary school student. I had a curious mind and loved to dismantle and reassemble things like clocks and toys," Professor Tao reminisced. "It was a real eye-opener and helped broaden my horizons on science and technology."

From Yangzhou to Hong Kong

Professor Tao's fascination with scientific knowledge eventually steered her towards a career in the field of textiles. In 1994, she moved to Hong Kong and joined PolyU as Lecturer (College of Degree Studies) in the Institute of Textiles and Clothing (ITC). She went on to head the Institute between 2003 to 2011.

Under Professor Tao's leadership, ITC became one of the leading fashion and textile departments in the world. Working closely with the textile industry, she led a team of researchers from the Institute to win a HK$330 million government grant to host The Hong Kong Research Institute of Textiles and Apparel. She also founded the Nanotechnology Centre for Functional and Intelligent Textiles and Apparel, and the Research Centre for Smart Wearable Technology.

Over the past two decades, Professor Tao's team has secured more than HK$180 million competitive research grants. Of the 41 international and national patents it has obtained, 12 have been licensed to companies worldwide for industrial applications.

When inspiration strikes

One prominent example is a major breakthrough in yarn manufacturing that solved a long-term problem of the textile industry known as residual torque. This issue causes fibers to twist together, affecting the smoothness and quality of yarns.

Professor Tao had spent years trying to solve this problem before an idea struck her while she was having dinner one night in 2001. "I suddenly remembered something about yarn structure I had read when I was a doctoral student," she recalled. "A new idea occurred to me and I immediately wrote it down on the back of a paper napkin at the dinner table. It was about increasing the number of residual turns in the yarn and changing the tightness of the twists." When her idea was tried out on yarn spinning machines, it produced straight threads with no kinks.

The process not only improved yarn productivity and garment quality, but also reduced energy consumption and eliminated the discharge of industrial waste. The technology was subsequently trademarked under the name Nu-Torque. Today, the Nu-Torque Singles Ring Yarn Technology has received a number of patents in the US and China, and has been licensed to 12 textile manufacturers in Mainland China, Hong Kong, Taiwan, Thailand and Australia. It has also been used in the production of textile and apparel products worth over HK$13 billion.

Passionate about solving the problem of residual torque, Professor Tao immediately wrote down a new idea on a table napkin which led to the invention of the Nu-Torque technology.

Vision, Inspiration and Persistence

Professor Tao's pioneering research achievements over the decades have played a pivotal role in fostering the development of Hong Kong as one of the world's leading centres in the field of textile technology. "From my research team, four technology companies have been spun off," she said. "It is pleasing to see that our work has led to inventions adopted by the industry worldwide, enhancing production efficiency, cutting costs and satisfying the markets with value-added functional products."

Professor Tao is currently focusing on two research areas – smart-textiles integrated with wearable systems for health-related applications, as well as wide-spectrum anti-pathogenic biopolymers and textiles for healthcare purposes.

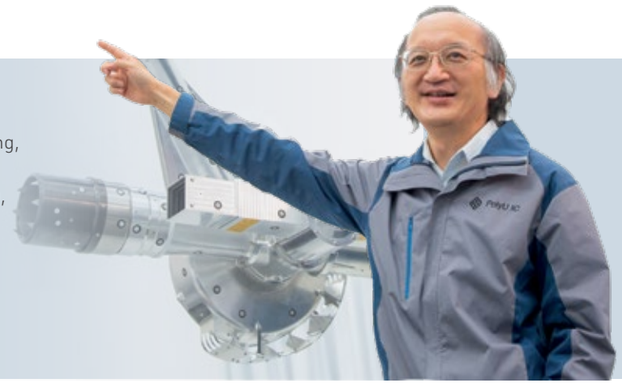
Looking back at her distinguished career as a pioneering researcher, Professor Tao cited loneliness as the biggest challenge she has had to overcome. "Your work may not be understood or supported by others when new ideas first come out," she explained. "You need to have confidence in your own scientific judgment and persist in the course you have chosen."

To aspiring scientists pursuing their dreams, Professor Tao summed up her advice in three words: VIP (Vision, Inspiration, Persistence). "I would encourage them to follow their **vision** and be observant of things around them as **inspiration** can come in any shape or form. With **persistence**, their efforts will be rewarded in the long run."

Veteran engineer reflects on 30 years at the Industrial Centre

Ir Dr Robert Tam

- Higher Diploma in Production & Industrial Engineering, Hong Kong Polytechnic, 1982
- Associateship in Production & Industrial Engineering, Hong Kong Polytechnic, 1983
- MSc in Manufacturing Systems Engineering, University of Warwick, 1986
- PhD in Management, Harbin Institute of Technology, China, 2013



Ir Dr Robert Tam, Associate Director of PolyU's Industrial Centre (IC), is considered to be a walking encyclopedia of the Centre. After joining the then Hong Kong Polytechnic (the predecessor of PolyU) as an engineer in 1988, Dr Tam has witnessed the evolution of the IC over more than 30 years. He has seen it develop from a unique technical library with facilities and expertise for engineering education, to offering research support, to becoming an innovation centre.

Dr Tam is proud of IC's progression from its early days of mainly providing technical training for students, to later engaging in external consultancy services, and more recently supporting many research and innovation projects at PolyU.

The drive to create an impact

Among the projects the Centre has supported are the development of space tools to support China's lunar exploration programmes and the Railway Tunnel Deformation Monitoring System to enhance the operation of high-speed trains in the Nation. Dr Tam has particularly appreciated having the opportunity to cooperate with distinguished scientists and researchers on projects that have impact and bring benefits to the world.

Dr Tam has derived great satisfaction from driving the development of IC . He was instrumental in introducing computer-aided design (CAD) and computer-aided manufacturing (CAM) training for students, as well as automation technology to IC. "Automation became a trend in Hong Kong industry in the 1990s. Over the years, IC has trained many students with essential skills to meet local industry demand. I am pleased to see that many employers like hiring our students," he added. Dr Tam has also co-authored around 10 books on CAD/CAM and automation technologies, drawing on his experience at IC.

Success through teamwork

Dr Tam said: "One of the most valuable assets of IC is the strong team spirit of its staff." He recalled a time many years ago when IC planned to bid for a project to design an automated vehicle clearance system for the Immigration Department. One of the requirements for the bid was to set up a mock-up of the clearance system at IC's loading dock. "Our team was in high spirit to finish all the tiring tasks. Every staff member of IC was involved, and we cheered each other on," Dr Tam said. The team successfully completed all the required tasks just before the midnight deadline. "We will never forget that moment. Words just cannot express our complicated feelings," he said.

In recent years, IC has engaged in successful spin-off developments, such as the Aviation Services Research Centre (ASRC) and the University Research Facility in 3D Printing (U3DP) in 2013 and 2017 respectively. "We were filled with pride that the world-famous Boeing Company collaborated with us to set up the ASRC to advance aviation service technologies," Dr Tam said. The U3DP is also the first of its kind in the local higher education sector.

Dr Tam's exemplary service and dedication have won him high respect from his colleagues and recognition from the University, including the President's Awards for Excellence Performance/ Achievement in 2000 (Individual Award), 2006 (Team Award) and 2013/2014 (Team Award).

Occupational therapy students win innovation design awards

Five student teams from PolyU's Department of Rehabilitation Sciences scooped five out of the ten awards at the Global Student Innovation Challenge (Design category) at the 14th International Convention on Rehabilitation Engineering and Assistive Technology (i-CREATe 2020). The competition encourages students from all over the world to develop creative and innovative devices or solutions that improve the quality of life for the elderly and people with disabilities.

Project: Sockcess | Award: Silver
An innovative socking aid, which modifies the designs of current products to help users put on ankle socks

Awardees: Jocelyn Cheong, Jane Cheung, Esther Hon, Bonnie Lai, and Boey Lee

Project: BraVo | Award: Bronze
An assistive tool which helps women who suffer from one-sided weakness, either after a stroke or from another injury, to put on a bra independently

Awardees: Icy Wong, Kathy Wong, Sprindy Wong, and Angus Pun

Project: Slide 2 Dry | Award: Merit
A practical, durable and affordable alternative to traditional clothes pegs for people with weak pinch strength, poor hand dexterity and/or other disability-inducing conditions

Awardees: Chloe Kwong, Hannah Chan, Geisty Shu, and Chloe Ting

Project: Bedman | Award: Best Presentation
A bedsheet changing aid for people with physical difficulties, such as hemiparesis, rheumatoid arthritis or reduced upper limb muscle strength

Awardees: Issac Yeung, Natalie Cheung, Cherry Keung, Regina Lee, and Felix Wong

Project: Eager-to-Hang | Award: Best Prototype
A new idea derived from current commercial multi-clip hangers that aims to make hanging clothes easier

Awardees: Christy Lam, Rita Hung, Anna Lam, Florence Lau, and Cathy Shing

PolyU E-Formula Racing Team designs and builds own race car

Members of the PolyU E-Formula Racing Team, led by Captain Brian Tam of the 2020 Season, have demonstrated their aspiration, creativity and endurance through designing and building their own race car for the Formula Student Electric China (FSEC) competition despite COVID-19 restrictions.

"To make sure the car building process could continue, some members who were outside Hong Kong switched to small-scale assembling at home using components they ordered online," Karan Patel, the team's Technical Director for the 2021 Season, said. "They then posted the finished parts to the campus or brought them with them when they later flew back to Hong Kong."

"Members in Hong Kong took turns doing the fabrication work in small batches because of the group gathering ban. There were also alumni members who would come back to campus after office hours and work late into the night," Tam said.

Although the team was not able to take part in the competition in 2020, they successfully organised a virtual rollout ceremony to showcase their car in January 2021.

The PolyU E-Formula Racing Team, established in 2015 by nine mechanical engineering students, is the first racing team formed by university students in Hong Kong to participate in the FSEC competition. The team currently consists of more than 40 students from various disciplines, including engineering, computing, business and design. It has gained support not only from the University's Faculty of Engineering and the Industrial Centre, but also from advisors from motorsport industries and various sponsors.

The Team has so far designed and built four race cars, including HKF-04E (right) which they built amid the COVID-19 pandemic and HKF-03E (left) which had raced in the FSEC 2019 competition.

Surveying student 'rejuvenates' historical building

Photo source: The Hong Kong Institute of Surveyors

Congratulations to Ada Lo Wing-yan, a second-year student of PolyU's Department of Building and Real Estate, for being named champion of the Tiny Model (Public Category) at the "Maintenance and Appreciation of Historical Buildings" Creativity Competition, organised by The Hong Kong Institute of Surveyors.

Ada's winning model was a detailed miniature of the Grade 1 Historic Building "Lui Seng Chun", a four-storey tong-lau constructed in 1931. Built on a 1:200 scale, the model showed the unique architectural features of the historical building, as well as its internal and external structures, both before and after its revitalisation. This was done through using beige materials to show the original structure and grey ones to illustrate the post-renovation structure.

"The experience has enhanced my awareness of heritage conservation and deepened my understanding of the role of surveyors," Ada said. "I think surveyors are like doctors to buildings. Through conservation and timely maintenance, historical buildings are given a new lease of life to demonstrate their aesthetic and historical values for the public to explore." This sentiment led Ada to name her model "Rejuvenation".

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Excel x Impact

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POLYU'S NEW SOUVENIRS

The University provides a selection of PolyU-themed souvenirs, ranging from apparel & accessories to stationery and premium gifts. A brand new collection has been launched and is available for purchase at the PolyU Bookstore.

More new souvenir items coming soon!
Stay tuned!