



June 2015

MESSAGE FROM THE DEAN



Welcome to this issue of Engineering Faculty Newsletter. It is with great pleasure that I share with you some recent research and development achievements of our staff and students, as well as event and news highlights. Being one of the University's founding faculties, the mission of the Faculty is to provide a well-rounded curriculum and high quality engineering education for students in the global knowledge-based economy, and to engage in innovative, high impact basic and applied research within and across disciplines.

Facing changes in the global arena, we are committed to nurture a generation of engineers who not only possess the skill-sets to tackle these challenges, but are also more innovative, entrepreneurially-focused and competitive.

I am delighted to announce that the commitment of our teachers and students as well as dedication of our alumni paid off as recognized by the latest QS Rankings which placed HKU Engineering at the world's top 7 in terms of Employer Reputation whereas Civil Engineering and Computer Science stayed at the 9th and 12th in the World Rankings by Subjects respectively.

The Faculty has also identified Advanced Robotics as one of the key research initiatives, aiming to foster leading-edge technology development in HKU as well as to enter the world stage of innovation in the area of robotics. I am so honored to share with you that the honorable Mr. John Tsang, Financial Secretary of the HKSAR Government, has recently visited our Advanced Robotics Laboratory. The visiting group was greatly impressed by the many innovative applications and the commercial potential of the various technologies that would sit well with the different economic pillars of Hong Kong.

The Faculty of Engineering would like to offer its sincere thanks to our colleagues, students, alumni and friends for their contribution, and we look forward to your continued support to the Faculty.

Norman C. Tien
Dean

Dean of Engineering



Prof. Norman C. Tien

Associate Deans



Prof. Francis T.K. Au



Prof. David W.L. Cheung



Prof. Ricky Y.K. Kwok



Prof. Francis C.M. Lau



Prof. A.H.W. Ngan



Prof. L.G. Tham



Prof. Ed X. Wu

Department Heads



Prof. S.C. Wong
Civil Engineering



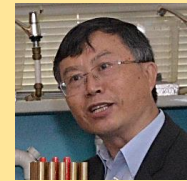
Prof. W. Wang
Computer Science



Prof. Victor O.K. Li
Electrical and Electronic Engineering



Prof. George Q. Huang
Industrial and Manufacturing Systems Engineering



Prof. Y.G. Li
Mechanical Engineering



Facts about HKU Engineering

- Five Departments in the Faculty of Engineering

Civil Engineering	Computer Science	Electrical and Electronic Engineering	Industrial and Manufacturing Systems Engineering	Mechanical Engineering
-------------------	------------------	---------------------------------------	--	------------------------

- **2,000+** undergraduate students and **2,100+** postgraduate students
- Over **145** academic staff members
- **10** Undergraduate Programmes
- **12** Taught Postgraduate Programmes

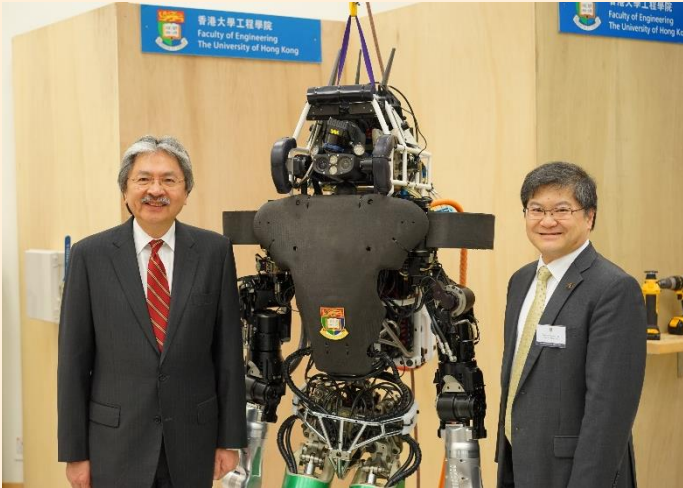
- Civil Engineering
- Computer Science
- Computer Engineering
- Electrical Engineering
- Electronic Engineering
- Industrial Engineering and Technology Management
- Logistics Engineering and Supply Chain Management
- Mechanical Engineering
- Medical Engineering
- Engineering Science

- Building Services Engineering
- Electrical and Electronic Engineering
- Energy Engineering
- Environmental Engineering
- Geotechnical Engineering
- Industrial Engineering and Logistics Management
- Infrastructure Project Management
- Mechanical Engineering
- Structural Engineering
- Transportation Engineering
- Computer Science
- Electronic Commerce and Internet Computing

- Key Research Areas

- Frontiers Technology
- Robotics Technology
- Health Technology
- Sustainability

Financial Secretary's visit to the Advanced Robotics Laboratory



Financial Secretary and Dean with HKU's humanoid robot Atlas

On May 18, 2015, the honorable Mr. John Tsang, GBM, JP, Financial Secretary of the HKSAR Government, spent an afternoon at the Engineering Faculty's Advanced Robotics Laboratory and was accompanied by Ms Janet Wong, Commissioner for Innovation and Technology, Professor Yue On-ching, Science Advisor of the Innovation and Technology Commission, and Ms Marjorie Yang, GBS, JP, Chairman of the Esquel Group, a leading textile and apparel manufacture. Mr. Douglas So, Vice President and Pro-Vice-Chancellor (Institutional Advancement), also joined to greet the prestigious guests.

The Dean began by stating the rationale behind the Faculty's introduction of Robotics as one of the key strategic research areas and the progress made in teaching and learning of robotics in the taught curricula, research efforts and knowledge exchange of promoting the subject to a broader community spectrum. This was followed by presentations from teachers and students that revolved around how research in robotics has been contributing to shaping Hong Kong's economy



The Dean delivering his opening remarks

in the areas of aiding an aging population as well as alleviating labour-intensive manufacturing industry and how HKU robotics initiative puts Hong Kong on the world stage.

Topics covered by teachers and students:

- "Virtual Reality in Robotics and Automation" by Dr. Henry Lau, Department of Industrial & Manufacturing Systems Engineering
- "Medical Robots" by Dr. Ka Wai Kwok, Department of Mechanical Engineering
- "Application of Robotics in Logistics" by Prof. George Huang, Department Head of Industrial and Manufacturing Systems Engineering
- Demonstration on "Robotics Object Handling" by Dr. Jia Pan, Department of Computer Science
- "Robots Built from Soft Materials and Actuation Systems" by Dr. Zheng Wang, Department of Mechanical Engineering
- "An example of ITC funded project on robotics - Powering Robots with Electro-Rheological Fluids (ERF) Technology" by Dr. Michael Chen, Department of Mechanical Engineering
- "Artificial Intelligence" by two students, Mr. Anson Wong (UG) and Mr. Johnny Lin (MSc), Department of Computer Science
- Demonstration on "HKU's Humanoid Robot Atlas" by Dr. Chris Roberts, Department of Electrical and Electronic Engineering

Thanks to the teachers and students who made impressive and coherent presentations that day, the visit was a great success! The guests were particularly impressed by the presence of a team of students who are working in the area of robotics and they enjoyed a lot in talking to the students.



Demonstration on robotics object handling



Demonstration on HKU's humanoid robot Atlas



Ms. Marjorie Yang sharing with students



The visiting group with all presenters, Mr. Douglas So and Faculty Members

HKU Engineering ranked 7th in “Employer Reputation” in QS World University Rankings by Faculty

According to the QS World University Rankings by Faculty in 2014, HKU ranked no.7 globally in “Employer Reputation” in the “Engineering and Technology” category. This means that HKU Engineering graduates are highly valued by their employers, and are also among the best in the world. The employer reputation indicator is based on a global survey, with almost 28,800 responses for the 2014/15 edition – considered the largest of its kind. The survey collected data from employers to identify the universities they perceive as producing the best graduates. This indicator is unique among international university rankings. The purpose of the employer survey is to give students a better sense of how universities are viewed in the job market.

HKU Civil Engineering and Computer Science ranked 9th and 12th respectively in QS World University Rankings by Subject 2015

HKU Civil Engineering ranked 10th in 2014;
 HKU Computer Science ranked 14th in 2014.



Engineering graduates' lunch with Dr. Chow Yei Ching

One of the most successful entrepreneurs in Hong Kong, **Dr. Chow Yei Ching**, Chairman of the Chevalier Group, hosted three lunches to share his wisdom accumulated over six decades of entrepreneurial experience with our lucky engineering graduates, accompanied by Dean Prof. Tien, Prof. Ricky Kwok, Prof. Alfonso Ngan and Dr. Kaimin Shih.



Dr. Chow Yei Ching, Prof. Ricky Kwok (2nd and 3rd from the left), Dean Prof. Tien (2nd from the right) and nine graduates had a wonderful lunch last December

The first round of lunch was held last December. Dr. Chow started off by telling an incredible story of riding his motorbike all the way from Hong Kong to Shanghai in nine days. The most amazing part is that the trip happened not so long ago!

The second round of lunch was held in late January. Dr. Chow enjoys flying, but his ways of life are always down-to-earth. And he believes one should not override the basic morals no matter what he/she is dealing with.



The second round of lunch at the Aviation Club in January with Dr. Chow Yei Ching (2nd from the left), Prof. Alfonso Ngan (2nd from the right) and nine graduates

A certified pilot, Dr. Chow, is clearly an ambitious adventurer and risk-taker, qualities that are essential for someone who aspires to be a successful entrepreneur. Indeed, when asked by students about what he thinks are the necessary ingredients

for success, Dr. Chow, like many highly successful people, gave the “common sense” advice:

- Be truly sincere to people;
- Be honest;
- Work hard;
- Respect others (e.g., never be late—it is always better to arrive five minutes early than to be five minutes late); and
- Help others (e.g., giving out money but expect nothing in return)

Simple as these precepts might seem, we all know it is never easy to comply wholeheartedly with such “rules”.

It is clear that Dr. Chow truly means what he believes in action, down to a very detailed level, evident in acts such as paying the bill in cash (and tipping the server). As “illustrative examples”, stories about his business dealings with Koreans and Japanese were told, and everyone was inspired by the important lessons about discipline, integrity and commitment.

Dr. Chow is a true patriot in that he expressed prudent concerns about our country in many aspects— economy, education, environment, etc.— despite its recent success on the world stage. In particular, he thinks that, to achieve sustainable success in our country, while university education is important, family education is extremely critical, too. Indeed, he very much values the traditional Chinese culture of bringing up a person— to become a decent individual (君子). Specifically, he reminded us of an old saying: “Do a good deed and want people to know, that is not a real good” (善欲人見，不是真善).

As always, the parties had to end when the discussions were at their climaxes. Apart from wisdom and experience sharing, photo-taking, etc., before saying good bye, Dr. Chow very kindly offered his advice in terms of career development which was very valuable to our young graduates.



The third round of lunch was held in April with Dr. Chow Yei Ching (5th from the right), Dr. Kaimin Shih (first right) and eight graduates

Breakthrough technology in wireless power transfer

Professor Ron Hui's latest breakthrough on wireless charging technology has been widely reported by the media.

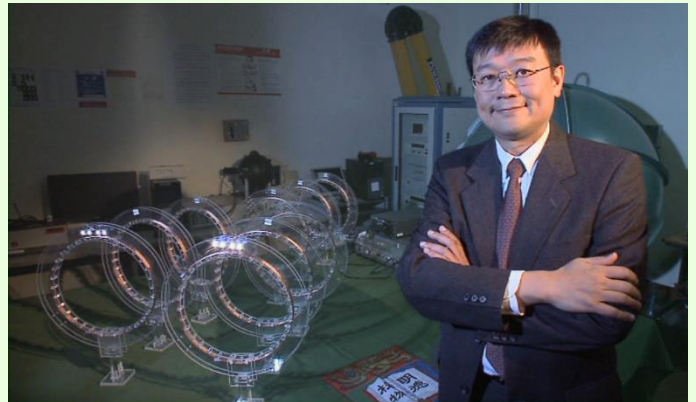
With the announcement by the Swedish furniture company, IKEA, to launch a new series of furniture and products with wireless charging pads embedded, wireless charging has gained new momentum in its course to reach globalization. The Wireless Power Consortium (WPC), an international organization formed in 2008 to promote a global wireless power standard launched the world's first wireless power standard "Qi" in 2010 for charging portable consumer electronics such as mobile phones.

The basic principles of wireless power transfer (WPT) were pioneered by Nicola Tesla in late 19th century. However, there were not many WPT applications in the first half of the 20th century, because several key technologies such as power electronics (with fast switching capability to form high-frequency power supplies), Litz wire (to reduce winding resistance) and high-frequency magnetics were not available. Such situation changed in 1980 when these three elements have reached their mature stages for mass production.

With the dawn of the mobile phone era, Prof. Hui and his team members have systematically developed a series of technologies for planar wireless charging systems since the late 1980s. Such technologies underpin key features of the Qi standard with free-positioning, localized charging and compatibility check features.

Prof. Hui's contributions focused on the user-friendliness and technologies that can meet the safety and international regulations. He developed a multilayer planar coil array structure that can generate magnetic field uniformly over a flat surface, making it possible and easy to place and charge several electronic devices on the surface simultaneously regardless of their orientations. The localized charging principle and compatibility check technique ensure that energy flow only occurs to compatible electronic devices within the covered areas between the electronic devices (being charged) and the charging surface. Since the magnetic flux is totally enclosed, there is no magnetic flux leakage. Consequently, incompatible items such as credit cards, smart cards and cigarette lighters will not be affected.

The challenges that Prof. Hui faced in the R&D process were both financial and technical. He was partially supported by small RGC funds and partially supported by Philips Electronics in the early stage of this R&D work. This invention caught the attention of a



Prof. Ron Hui, Department of Electrical and Electronic Engineering, and the Wireless Domino Power Transfer Systems

senior management member of major European electronics company, who eventually formed a start-up company named Convenientpower Ltd. with several local partners in the Science & Technology Park to develop and market this planar wireless charging technology. With their business visions and skills, they managed to gather many major electronics companies to form the WPC in 2008 and launched the Qi standard in 2010.

The technical challenges were rather different. The initial obstacles were the lack of electronics components that are of planar or flat shape. As the awareness of wireless power research increased, component manufacturers were willing to produce planar components and control integrated circuits for such applications. Despite some initial difficulties, Prof. Hui enjoyed good partnership with his former research students, who are in senior positions in wireless power industry.

Since joining HKU in 2011, Prof. Hui has led a research team conducting new research in WPT. They have developed the wireless domino power transfer techniques which can substantially increase the transmission distance without compromising energy efficiency. Wireless domino power transfer systems can be formed in various forms. Currently, he and his team are extending the traditional "directional" WPT methods to "omni-directional" WPT systems. Several patent applications on this topic have been filed through the Technology Transfer Office of HKU. In addition, the HKU team has been working on new wireless charging techniques for electric vehicles. Despite the severe lack of large research funds in HK, his team has been focusing on new WPT technologies that have the potential to make global impacts. It is envisaged that such technologies will attract the attention of industry worldwide, as the planar wireless charging pad technologies did in the past.

Research work on energy harvesting from desalination of sea water

Desalination is making its way back to Hong Kong. The first desalination plant in Hong Kong was built in the 1970s during which water shortage prevailed. The thermal-based plant was known to be too costly to run, causing it to be decommissioned. A new desalination plant is now planned. Upon its completion in 2020, the initial phase of the plant can provide about 5% of the total water supply in Hong Kong. The research findings were published in Ming Pao on January 2.

The new desalination plant adopts the state of the art reverse osmosis (RO) technology, where a high pressure

is applied to “squeeze” water through a dense membrane. Despite its much higher energy efficiency compared to thermal distillation (see Table 1), RO desalination remains relatively energy intensive due to its requirement of high pressure pumping – 3-4 kWh of electricity is typically required to produce 1 m³ of clean water. Furthermore, desalination produces an undesirable byproduct known as brine that contains the salts removed from the seawater. Discharge of the highly saline brine (containing ~ 70 g salts/L) in an uncontrolled manner can cause severe ecological damage.

	Principle	Electricity requirement (kWh/m ³)	Thermal energy requirement (kWh/m ³)	Current installation
Thermal distillation	Evaporation of water at high temperature	1.5 – 5.5	25-120	Mainly in the Middle East
Reverse osmosis	High pressure pumping of water through a salt-rejecting membrane	3-4	Nil	The majority of new desalination plants (U.S.A., Australia, Singapore, and some Middle East countries)

Table 1: Comparison of thermal distillation and reverse osmosis technologies

A research team at the University of Hong Kong has been studying the beneficial use of brine for electricity generation. The team, led by **Associate Professor, Dr. C.Y. Tang** from the Department of Civil Engineering, draws experts from desalination, chemistry, and power generation. The core technology is a process known as reverse electrodialysis (RED). By coupling the saline brine to a low-salinity solution (e.g., treated wastewater), the RED process is able to extract the salinity gradient power (also known as osmotic power) by converting the chemical potential energy arising from the salinity difference into electricity. A typical RED stack consists of several cation and anion exchange membranes in an alternative sequence. Under the concentration difference between the brine and dilute solution,

positively charged ions (e.g., sodium) transport through cation exchange membranes, while negatively charged (e.g., chloride) through anion exchange membranes. The ionic current will then be converted to electricity at the electrodes. According to the team’s estimation, the hybridization of RO-RED technology can reduce energy consumption of desalination by approximately 30%. Furthermore, the RED treated brine has reduced salinity for its subsequent environmentally-friendly disposal. The team, supported by the Strategic Research Theme in Clean Energy of the University, is looking for ways of improving the power density and conversion efficiency of the process.

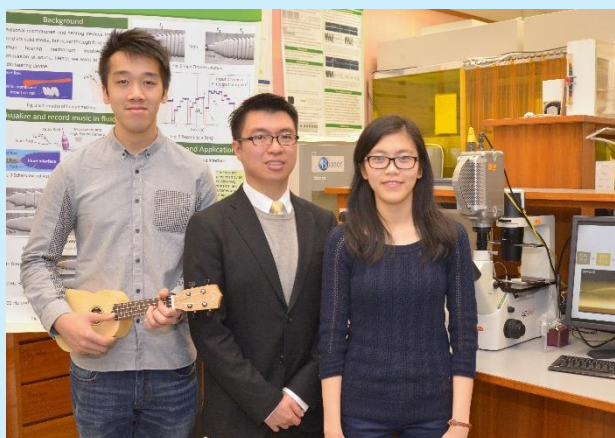
Explore sounds in the inaudible world with a novel water-water system

A group of **Mechanical Engineering undergraduate students** at the University of Hong Kong, under the guidance of the department's **Assistant Professor, Dr Anderson Shum**, successfully “captured” Beethoven’s 5th symphony with a novel water-water system. The news was widely covered by over ten newspapers on February 23.

The novel liquid system consists of a mixture of two immiscible aqueous phases, the interface of which possesses an ultra-low interfacial tension which is super-sensitive to stimulation of sound waves, i.e. any sound, audible or inaudible, can be “visualized” along the water-water interface.

In this research, the musical notes of Beethoven’s 5th symphony manifested themselves when passing through the aqueous interface of the system. And when translated back to music, the accuracy was over 97%, which is illustrative of the high sensitivity of the interface in detecting sound waves.

This “discovery” was reported in the world-renowned academic journal Nature Scientific Reports, published by the Nature Publishing Group. The achievement highlights the high quality of undergraduate research at HKU.



From left: Student Jimmy Chan, Dr. Anderson Shum and student Ms. Sibyl Mak pictured with the novel water-water system during the press conference

Besides audible sound, the system is capable of detecting sound waves with frequency lower than 20 Hertz, i.e., inaudible to human beings. It is anticipated that making use of this novel water-water system, sounds that are currently unknown to us can be heard. This would not only allow monitoring of infra-sounds generated by windmills or large electronic appliances such as air-conditioners, but also provides an opportunity to understand the communication among huge animals, such as elephants and whales, that communicates through inaudibly pitches with frequencies that can be below 10 Hertz.

Moreover, small fluctuations exist in human body; examples are heart beat and breathing cycle. In Chinese medicine, patterns of pulses signify the patient’s body conditions. Our approach provides a potential solution for capturing and precise measurements of these pulses and messages emitted by body organs or tissues transmitted through the bloodstream or body fluid. It will facilitate the development of relevant health technologies such as human body acoustics, or diagnosis of diseases.

The students involved in the projects are currently either pursuing higher degrees in engineering or working in the industry.



Musical notes of Beethoven's 5th symphony manifest themselves when passing through the aqueous interface

HKU supports secondary school competitions for students interested in engineering

Canadian Computing Competition (Hong Kong Contest) 2015 at HKU

158 students from 23 Hong Kong secondary schools participated in the Canadian Computing Competition (Hong Kong Contest) held on March 5, 2015 at the Department of Computer Science, HKU.

Prof. Norman Tien, Dean of Engineering, Prof. Francis Lau, Associate Dean of Engineering, and Prof. Wenping Wang, Head of Department of Computer Science, presented the prizes and certificates to the winners at the Award Presentation Ceremony held on March 19, 2015.

The top two winners of the Senior Division of this competition, Yik Wai Pan from Pui Ching Middle School and Tung Kam Chuen from La Salle College, will represent Hong Kong to take part in the Final Contest of the Canadian

Computing Olympiad held in May 2015 at the University of Waterloo in Canada.

This CCC HK Contest was arranged and coordinated by **Dr. C.K. Chui**, Lecturer of the Department of Computer Science.



Participants at the Prize Presentation Ceremony

The 12th Infrastructure Building Competition for Secondary Schools

In order to arouse the interest of secondary school students in engineering, our Faculty co-organises the Infrastructure Building Competition with Institute of Vocational Education (Tsing Yi) and Hong Kong Construction Association.

This year, 138 teams from 83 schools (including one from Macau) entered the competition. The Qualifying Round, held on March 7, 2015, tested the static deflections of the models when a 5-kg load was hung onto them. The 60 models with the lowest deflections went on to the Final Contest which was held on March 28, 2015.



Loading test to measure static deflection in Qualifying Round

During the Final Contest, a loaded trolley was pulled along the upper surface of the model. After the trolley made a trip, the load was increased and the trolley was pulled for another trip. This process was repeated until the model failed.

Prizes were given to the teams that built the model capable of carrying the heaviest load, the model with the highest load efficiency (defined as load carried divided by model mass), and the model with the best design.

Our Dean, Prof. Norman Tien, and Assistant Dean, Dr. K.C. Cheung, were two of the officiating guests of the Competition.



The Dean addressing the audience

Sharing session of Project Mingde – Your light should light up others!

A sharing session delivered by the current members of Project Mingde (明德工程) was held on March 4, 2015 to promote the Project within the campus and to recruit a new generation of student members for the continuity of Project Mingde.

Project Mingde was first initiated by an alumnus of the Department of Civil Engineering, Professor Nicolas S.Y. Yeung and his wife, Lorene, in 2003, trying to help relieve the education problems of ethnic minority children in remote mountainous Guangxi Province and at the same time providing Civil Engineering students a valuable opportunity to work on real-world on-going projects. Deeply moved and impressed by Prof. Yeung's beliefs, a group of dedicated alumni and teaching staff of the Department, especially the Head of the Department then, Prof. Peter K.K. Lee, devoted tremendous efforts in making Project Mingde a success.

In addition to Engineering, there were students from Architecture, Business and Economics, Law and Science. It is encouraging that more than 45 students registered for membership of Project Mingde within a week after the sharing session!

The session was composed of three parts. In the first part, core members of current undergraduate students from the Department of Civil Engineering, Mr. Steve Ho, Mr. Martin Wong, Mr. Samson Pung, and postgraduate student from the Faculty of Architecture, Mr. Bond Chong, shared the values of Project Mingde and their experience. The spirit of the Project Mingde slogan "We grow as we build" was vividly revealed. Project Mingde not only helps the impoverished children in the mainland, but also inspires our students. They start to realise that they are the lucky ones and they should treasure what they have and help others in need. This is what Samson mentioned in the sharing, "Your light should light up others!"



Dr. Ryan Wong introducing the upcoming projects

The second part was presented by Dr. Ryan Wong, Department of Civil Engineering, regarding the upcoming projects in Sancun Village (三村里), Daping Village (大坪村) and Vietnam. Last but not least, there were group discussions. Participants were divided into three small groups with three to four current members of Project Mingde so that they could casually raise any questions. All the groups had fruitful discussions and the participants knew more about the mission and vision of Project Mingde, especially what they could contribute and the associated workload. Participants were touched by what Project Mingde did in the past ten years. The current members said it was a meaningful evening and they all look forward to working with the passionate and enthusiastic new members!



Fruitful group discussion

Brand new Research Postgraduate (RPg) Centre - a stimulating environment for research collaboration



A 3-D sketch of the new RPg Centre



Adopting a design concept of student commons with common area and discussion rooms

The Faculty strives to provide an environment that facilitates research and fosters innovation. With an ever growing number of RPg now surpassing 550, a rise of nearly 50% over the past 8 years, the Faculty has set as one of its top priorities to strengthen support to the students in a holistic manner and to provide them with a stimulating learning environment.

This is now made possible through the establishment of a brand new RPg Centre at Ground Floor of Haking Wong Building to house RPg students (around 200) and visiting professors starting from the academic year in 2015-2016. The space, formerly the Technology Support Centre, spans around 750 square meters, will be converted into a self-sufficient open-plan office. With a high headroom, a mezzanine floor will be constructed so that the expanded area will be able to accommodate around 200 cubicles, a few rooms for visiting professors and staff. Adopting a design concept of student commons, the Centre will facilitate group interchange in discussion rooms yet retain quiet environment for individual students.

The Centre, as a focal point of RPg student-centered learning programmes in the Faculty, not only serves as a platform to facilitate interdisciplinary exchange and research collaboration, but also offers RPg students an opportunity to interact with overseas scholars and enhances student-oriented development programmes. The renovated space will facilitate the Faculty to continue recruiting top RPg students locally and internationally which are vital in the enhancement of the Faculty's research capability.

Graduate Mentor Scheme (GMS) 2015 Inauguration Ceremony

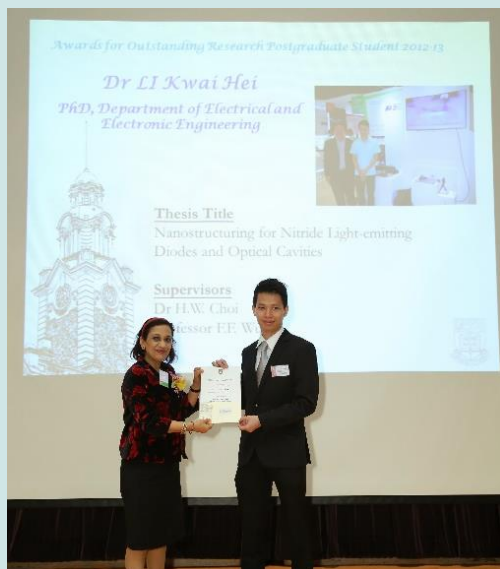


Ir. C. S. WAI (left), JP, with mentors and mentees at the Inauguration Ceremony, joined by Prof. Francis Lau (front row, 3rd from the right)

HKU Engineering Alumni Association (HKUEAA)'s mentors are prominent figures from the Government, public utilities, and various leading companies in both engineering and non-engineering fields. They include experienced chartered engineers, fellows of international engineering organizations, chief executive officers, chief technology officers, HR directors, business directors, and managers at various levels.

The Inauguration Ceremony was kicked off by an inspiring opening speech delivered by Ir. C.S. Wai, JP (President of HKUEAA and the Permanent Secretary for Development (Works) of the Government of the HKSAR). Prof. Francis Lau (Associate Dean, Faculty of Engineering) and Mr. Oscar Chan (Chairperson, ENS, HKUSU, Session 2014 – 2015) shared their views and expectation on the GMS 2015. Other guests of honor included Ms. Janet Chung (Director (Alumni) of DAAO HKU), Ir. Y.M. Chan (Vice-president of HKUEAA (Students Affairs), Session 2014 – 2015), and Ir. W.H. Luk (Vice-president of HKUEAA (Alumni Affairs), Session 2014 – 2015).

Research to Cut Cost of LED Lamps



Dr. Li Kwai Hei (right) at the Award for Outstanding Research Postgraduate Student presentation ceremony

Dr. Li Kwai Hei from Department of Electrical and Electronic Engineering, recipient of the Award for Outstanding Research Postgraduate Student, carried out his research work based on the nanostructuring technique he developed. He has demonstrated the use of nanosphere lithography (NSL) to pattern various novel nano-structures on GaN semiconductors. Compared with other possible top-down approaches for fabricating nanostructures such as e-beam evaporation and focused ion beam, NSL has its predominance in forming close-packed arrays across a large area. Moreover, NSL overcomes resolution issues arising from diffraction limit in optical lithography and even limitation of beam size in electron-beam lithography. The low set-up cost and high throughput also makes NSL potentially suitable for mass production. The news was reported by Sing Tao Daily on January 14.

Dr. Li has applied nanosphere lithography to nitride-based light-emitting diodes (LEDs) and laser diodes, and achieved significant accomplishment. His investigations led to the possibility of increasing the light extraction efficiency and modifying emission characteristics of LEDs by using an easily-achieved regularly-structuring technique. He also demonstrated

the nano-cavities laser structure. Compared with other fabrication techniques, NSL shows great advantages in producing high-density well-defined nano-cavities.

It is generally considered that the standard procedure of NSL would result in tedious close-packed pillar array and does not work for PBG structures and laser cavities. However, Dr. Li has explored new approaches and overcome the patterning restriction of NSL. He has discussed his work recently at several international meetings and attracted wide attention. Without a doubt, his research works are particularly important in tackling two of major concerns in the field of optoelectronics; low light extraction efficiency of LEDs and lack of practical approach for fabrication of high-quality short-wavelength laser cavities.

Dr. Li's thesis work is of great importance and interest in the nanofabrication, LED and solid-state devices communities. Dr. Li convincingly proves that based on the self-assembling mechanism NSL can be used to create well-defined periodic pattern (2D photonic crystal) for enhancing the light extraction in LED, forming whispering-gallery mode (WGM) circular disk/ring laser microcavities, and for making micro-lens on flip-chip LED.

His experimental results and theoretical analysis can be expected to enhance state-of-the-art design and fabrication of optical devices used in GaN-based photonic applications. After further optimization, this technology should be suitable for making light sources and other optical components in the future.



A rewarding year for Engineering Research Postgraduate Students



A total of 24 Engineering research postgraduate students were presented fellowships / scholarships / prizes at the Award Presentation Ceremony, representing 23% of the awards made by the entire University in this academic year. The ceremony was organized by the HKU Graduate School on December 9, 2014 (Tuesday) at Rayson Huang Theatre. The recipients were selected based on the quality of their thesis and academic performance.

Excellence in Teaching, Research and Knowledge Exchange 2014

The Award Presentation Ceremony for Excellence in Teaching, Research and Knowledge Exchange 2014 was held on March 30, 2015 at Lok Yew Hall.

On April 2, 2015, HKU held a media briefing for Prof. Yuguo Li, one of the winners of the Outstanding Researcher Award, to describe his latest research findings: Ventilating our high-rise compact city - how to mitigate wind weakening in Hong Kong. Over fifteen reporters from newspapers, TV stations, radio stations attended.



Prof. Yuguo Li, Department of Mechanical Engineering and Prof. Peter Mathieson, President and Vice-Chancellor



Prof. Lam Tak Wah (represented by Dr. C.K. Tsui, right), Department of Computer Science, recipient of the Faculty Outstanding Teaching Award



Dr. Barbara Chan (2nd from the left), Department of Mechanical Engineering, and her team received the Research Output Prize



Faculty Knowledge Exchange Award recipient, Dr. Wilton Fok (middle) and his team, Department of Electrical and Electronic Engineering

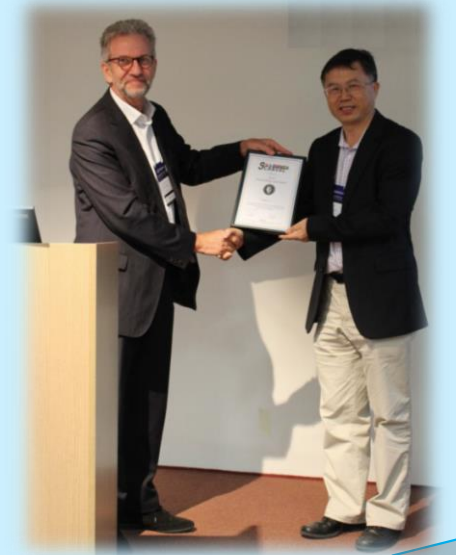
Professor Y.G. Li received the John Rydberg's Gold Medal

A jury representing the HVAC societies in Denmark, Norway, Sweden and Finland has awarded John Rydberg's Gold Medal to **Professor Yuguo Li**, Head of Mechanical Engineering, for his extensive and engaged work on building-related fluid dynamics. The Gold Medal was awarded at the 13th ROOMVENT Conference in Brazil on October 22, 2014.

Over the years, Prof. Li has made ground-breaking research in areas like computer-simulated air distribution, minimization of the

risk of airborne cross infection inside buildings and in urban areas, natural ventilation of buildings, ventilation of cities as well as urban heat islands. These are all areas where research is based on creativity and efficient use of fluid mechanical theory. These activities are in good agreement with the Swedish professor John Rydberg's own work in the last century.

John Rydberg's Gold Medal was founded by SCANVAC, which is an association of HVAC societies in the Nordic countries.



Professor Alfonso H.W. Ngan elected as Fellow of HKAES



Professor Alfonso Ngan (left) formally sworn into the Academy at the New Fellows' Dinner on January 21, 2015 at the Hong Kong Club

Professor Alfonso Ngan, Chair Professor of Materials Science and Engineering and Kingboard Professor in Materials Engineering, Department of Mechanical Engineering, was elected a new Fellow of the Hong Kong Academy of Engineering Sciences (HKAES) at the 21st Annual General Meeting held on December 17, 2014.

Founded in 1994 by eight visionary Fellows that include Sir S.Y. Chung and Professor Sir Charles Kao, the object of HKAES is to promote and foster excellence in the entire field of engineering and bring together Hong Kong's most eminent and distinguished engineers of all disciplines. Among the Fellows are prominent professional and society leaders that are able to offer impartial high level advice to the Government on matters of importance pertinent to engineering and the engineering community.

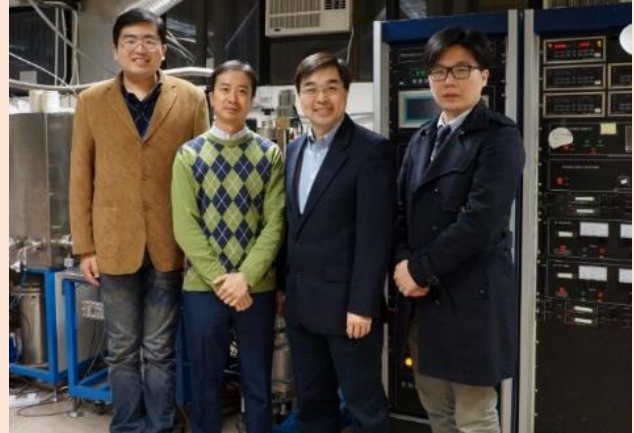
Professor X.Y. Li & Dr. Wallace Choy were awarded the CRF

Professor X.Y. Li, Department of Civil Engineering, has been awarded the Collaborative Research Fund (CRF) in 2014-2015 with project titled “Fe-enhanced primary sedimentation and sludge acidogenesis for resources (P and PHA) recovery during wastewater treatment”.



Professor X.Y. Li (4th from the right) and his team members from HKU, HKUST and PolyU

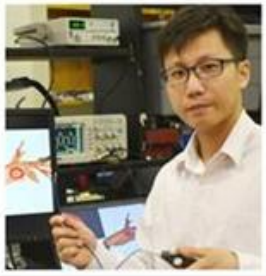
Dr. Wallace Choy, Department of Electrical and Electronic Engineering, has also been awarded the Collaborative Research Fund (CRF) in 2014-2015 with project titled “Inert-Environment Facilities for investigating optical- optoelectronics”



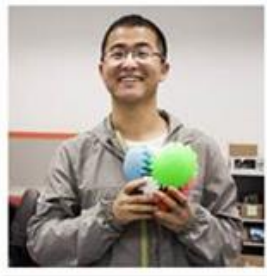
From left to right: Dr. Sha Wei (EEE, Co-PI), Dr. Tony Feng (ME, Co-PI), Dr. Wallace C.H. Choy (EEE, Project Coordinator), Dr. Paddy Chan (ME, Co-PI)

STAFF NEWS

Advanced Robotics Initiative- Four New Faculty Members



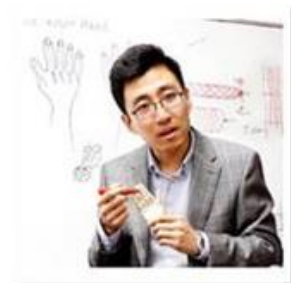
Dr. Ka-Wai Kwok (郭嘉威)
Assistant Professor,
Department of Mechanical Engineering



Dr. Jia Pan (潘佳)
Research Assistant Professor,
Department of Computer Science



Prof. Ning Xi (席靈)
Chair Professor,
Department of Industrial and
Manufacturing Systems Engineering



Dr. Zheng Wang (王峥)
Assistant Professor,
Department of Mechanical Engineering

HKU Engineering has set up the “**Advanced Robotics Initiative**” with a vision that it will become one of the most exciting multi-disciplinary initiatives in the Faculty. A wide range of research activities will push the forefront of high-valued healthcare and industrial applications, such as robot-assisted surgery, robotic exoskeleton and logistics to name but a few. State-of-the-art science and technologies from LiDAR (laser radar) vision sensors, intelligent control, motion planning to kinematics, and robotics studies will be called upon and developed.

With such exciting challenges ahead, we are delighted to announce that HKU Engineering has recruited four new staff members. They all come from top universities in the world with specialty on advanced robotics subject areas. As they collaborate with our Faculty members across disciplines, HKU Engineering is determined to drive for advances in robotics technologies. We will instill new knowledge into classroom and inspire researchers about future possibilities to position HKU Engineering as a leading institution in the region in robotics.

Feature stories of Prof. Francis Chin & Prof. Peter Lee



Prof. Francis Y.L. Chin (left) and **Prof. Peter K.K. Lee** (right)'s terms as Associate Deans of the Faculty ended on December 31, 2014, and Prof. Lee retired on the same day. Prof. Chin will retire at the end of June 2015. We are delighted to have a nice chat with Prof. Chin and Prof. Lee about their teaching experiences and future plans.

Reporter: *Could you share with us why you chose teaching as your career?*

Prof. Chin: In my younger days as a student, I had a passion for learning and this passion led me to pursue a Ph.D. Of course, after obtaining Ph.D., an academic career was the natural path for me to take. I have been working at HKU for 30 years and my academic career has spanned nearly 40 years. I have enjoyed all four aspects of academic work: research, teaching, administrative duties for the University and service activities for the community. Teaching is an important part of being an academic. Teaching is always fun. I like to challenge students with interesting problems and guide them to find the solution with the new tools they have learnt. I am proud to say that I have taught some really bright students who have gone on to have great success in their own careers. For example, in recent years I have had students who have had job offers from Google, Amazon, etc. I recently attended the stock market listing ceremony of a company founded by a few of my students.

Teaching also keeps me young because it means interacting with young people all the time.

Prof. Lee: In the engineering profession, guiding young teenagers to mature and become professional engineers is challenging. Engineering knowledge is always advancing fast with time. Ever since I joined the university 45 years ago, I have to concentrate in keeping myself abreast of the most up-to-date technological advancements and integrate such information into teaching and research leaving me no time to think of or venture into another career. In teaching, this means continuous updating the curriculum with introduction of new degree programs as necessary in order that the best learning opportunities are offered to the talented young people admitted to the university. The eventual reward of this teaching career is to watch that so many of our graduates have been able to serve and contribute to the society and help to shape a better Hong Kong.

Reporter: *What factors did you consider when taking up the Associate Dean role?*

Prof. Chin: Taking part in administrative duties of the Department, the Faculty and the University is important as an opportunity to shape the way forward for the University. During my tenure at HKU, I have served as the Founding Head of the Department of Computer Science for 12 years and an Associate Dean of the Faculty

of Engineering for seven years (not counting the four years of service outside our Faculty as an Associate Dean of the Graduate School).

Most of you might think that my administrative workload was heavy. On the contrary, I still spent most of my time on teaching, research and working with my students. Except for more meetings, I don't think that my administrative workload was especially heavier than many of my colleagues. On the whole, I enjoyed and learned a lot from these administrative duties. Through these experiences, I understand how decisions are made, the rationale behind each decision and the necessity for transparency to resolve conflicts.

Prof Lee: Through serving as Head of the Department of Civil Engineering for eight years, I gained administrative experience in managing the operation of a department. When called upon to the Associate Deanship, I contemplated that my experience from the department might contribute to the education of a wider scope of engineering disciplines within the Faculty.

Reporter: *What were the most unforgettable experiences during your teaching and Associate Dean roles?*

Prof. Chin: This is actually a very difficult question. Some say that, as a tenured academic, you don't have a boss. That's not true. I've had quite a few bosses during my 30 years at HKU in terms of deans and vice-chancellors. Bosses can make life unforgettable. Some of them are quite hands-off and others take a more caring approach. No single approach is better or worse than others. It takes time to adapt when transitioning from one boss to another.

Prof. Lee: I took pride in successful implementation of Project-Based-Learning pedagogy in the undergraduate curriculum in Civil Engineering. Over 90% of our students join the industry after graduation and these experiences have helped them in the development of their later career in engineering. Efforts in overcoming difficulties faced in mounting the 2+2 study program with Sun Yat Sen University and the Civil Engineering-Law

double degree program with the Faculty of Law also proved worthwhile. Graduates of these programs were well sought after by the industry.

During my tenure as Associate Dean, I was involved in the proposal for a new degree structure for the BEng programs. The new structure essentially provides a broad engineering education which is the direction modern university education is heading along.

Reporter: *Could you give some advice to the younger generations?*

Prof. Chin: Enjoy what you do, be open to opportunities that come your way, be transparent to resolve conflicts and remember who is boss.

Prof Lee: Apart from the knowledge you acquire from university, a positive learning attitude is equally essential. I hope every student can develop a mature mentality to become an all-rounded person.

Always remember, don't be afraid to do more and offer more. The more you contribute, the more you will be rewarded in the end. Students should have themselves well prepared for joining and contributing to the society.

Reporter: *What is your plan after your retirement?*

Prof. Chin: Although I will officially retire at the end of June, I still need to wrap up my responsibilities to the Department, such as completing supervision of graduate students and post-doctoral students and completing funded projects. After that, I'm not sure. As long as I am still healthy, I would like to continue contributing to society with my knowledge and experience.

Prof. Lee: Well, I do not have a concrete plan. I am gradually reducing my commitments in the university and venturing into something different outside. Currently, I am still involved with the work on Mingde projects.

Reporter: Thank you very much for making tremendous contribution to all aspects of academic work including research and teaching as well as administrative duties for the Faculty. We will miss the both of you. We sincerely wish you good health and all the best!

Re-appointment of Professor Victor O.K. Li as Head of Department of Electrical and Electronic Engineering

Professor Victor O.K. Li was re-appointed as Head of the Department of Electrical and Electronic Engineering from March 1, 2015.



Reporter: *What achievements do you wish to share with readers during your headship?*

Prof. Li: I believe the most important factor of success for our department is the people, i.e., teaching staff, students, support staff, and alumni. We also need to provide the best environment to enable them to be productive. During my tenure, the department has successfully recruited outstanding scholars, including both senior and junior colleagues. Such colleagues have been instrumental in our obtaining major research grants. We have also been successful at recruiting excellent PhD students, as demonstrated by the large number of HKPF awardees in the department. Our MSc programs have been very popular, and the number of students electing to join EEE as an undergraduate has been steadily improving in the last few years. We have also strengthened our connection with our alumni, and have organized home-coming events for several cohorts of EEE graduates. All these would not be possible

without an excellent team of supporting staff, and on behalf of the department, I would like to take this opportunity to thank them. The department has also invested in modernizing the department seminar rooms and common areas, and many visitors and alumni have been favorably impressed by our modern facilities.

Reporter: *What is your goal in assuming your re-appointment?*

Prof. Li: My goal is to serve the department the best way I can. In the next few years, we will continue to work on staff and student recruitment, updating our curriculum, and in modernizing our teaching and research facilities.

Reporter: *Given your busy schedule, how would you strike a balance between this role, teaching, research & life?*

Prof. Li: I strive to be an excellent researcher and teacher, and to provide service to the department, the University and the community. Over the years, I have learnt to multi-task and to be able to switch between tasks efficiently. As department head, sometimes you need to respond to unexpected demands on your time, and you need to be able to drop whatever you are doing and take care of such events. But then when you return to your previous task, you need to be able to pick up from where you left off immediately, because you don't know when the next interruption will occur. I also delegate some of the responsibilities to other colleagues. I thank the very capable Deputy Heads and other members of the department who put in much time and effort to ensure the department functions smoothly. I work on Saturday as this is the only day I have an extended block of time to focus on research. Sundays I reserve for my family.

Re-appointment of Professor W. Wang as Head of Department of Computer Science

Professor W. Wang was re-appointed as Head of the Department of Computer Science from January 1, 2015. We are delighted to have a nice chat with Prof. Wang.



Reporter: What achievements do you wish to share with readers during your headship?

Prof. Wang: Reflecting on the current development of the Department in teaching and research is immensely gratifying. We've smoothly passed the 3-to-4 year transition and the rapid growth of our MSc. program without compromising teaching quality. The performance of our teachers has consistently stood among the best in the university. Thanks to their admirable efforts and the tremendous leadership skills of Prof. Ben Kao, Prof. Tak-Wah Lam and Dr. Siu-Ming Yiu. Looking back at the past three years, I'd say that the most satisfying thing to have happened to us is the addition of new faculty members and Ph.D. students of outstanding quality. This was achieved through the joint effort of the entire department, especially the colleagues of DRPC led by Dr. Reynold Cheng. All of this success has benefited the increasing reputation of our research programme.

Reporter: What is your vision in assuming your re-appointment?

Prof. Wang: My vision as the Head of Department is simple: to lead the department to a higher tier of excellence in education, research, and knowledge transfer. In this way, we will continue to play our roles in building HKU into the best university we can be. The landscape of computer science research is very competitive in Hong Kong, which boasts three of the top 20 computer science programmes in the world according to the QS ranking, with the CS Department of the University of Hong Kong ranked tenth, fourteenth and twelfth in the past three years. While my colleagues and I are pleased with this distinct international recognition, we realise that we must strive to enhance our research and teaching/learning environment to make our department a first-rate international centre of research in computer science.

In the coming three years of my term, emphasis will continue to be placed on recruiting the best talents and providing full support to both junior faculty members and Ph.D. students, facilitating their research and studies and encouraging them to engage the international research community. Performance assessment and resource allocation will continue to be based on merit and competition, again with more support to our younger colleagues, the future of the department. While the department has established its solid reputation in the fields of data engineering, software engineering, computer systems, theory, bioinformatics, computer graphics, and vision, we definitely expect to see more development in the directions of robotics, programming languages, quantum computing, and financial computing.

Reporter: Given your busy schedule, how would you strike a balance between this role, teaching, research & life?

Prof. Wang: Life used to be more fun. Joking aside, "Head of Department" is a duty-when-called-for, so I must maintain my obligations to teaching and research. I believe in leading by example. Over the years, I've found that teaching can be time-consuming, but not difficult; you are willing to spend as much time as it takes to figure out the best way to teach if you are motivated by the joys of interacting with students, seeing them enjoy learning, and the gratification that I believe is exclusive to educators. In my view, it is professionally unethical not to deliver the best education to your students. That's why I can often understand why some colleagues may become inactive in research, but it is difficult to sympathise with poor teaching performance. Research is a different matter.

Thanks to my natural passion for research, I can spend all of my spare time on it, however limited. I wish that I could have more time to conduct research, so I genuinely appreciate the understanding and tolerance of my graduate students who now have to work more independently than before. In the long run, I hope that this will be good for their growth.

I'm fortunate to have the privilege of working with an excellent team of colleagues and advisors, especially the superb supporting staff of the General Office, led by Ms. Wandy Tong and Ms. Maria Lam. Among a very long list of colleagues who assist me on a daily basis in shouldering my job as Department Head, I would like to thank in particular Prof. Ben Kao, Dr. Reynold Cheng and Dr. K. P. Chow, who have to cope with a huge amount of work in managing our UG, RPG, and TPG programmes. I honestly cannot imagine surviving without the aid of my colleagues.

Sleeping well and exercising regularly are the two top conditions for me to physically prepare for my daily workload. Now, I cut the time watching NBA games to spend more time on the sports field.



Faculty of Engineering
THE UNIVERSITY OF HONG KONG

Alumni Contact Update Form (Please click [here](#) for the Online Form)

Surname*: _____

Given Name*: _____

University No.: _____

Year of Graduation*: _____

Programme*: _____



You may only fill in the information you wish to update:

Title: _____

Email: _____

Mobile: _____

Home Address: _____

Home Telephone: _____

Current Job: _____

Office Address _____

Office Telephone: _____

* Required field

Please submit this form by fax (852) 2546-9142, email: enggfac@hku.hk or by post to the Faculty Office. You can access the form by scanning the QR code.

Personal Information Collection

The Faculty of Engineering (the "Faculty") treats the data provided by you as strictly confidential. The data is for the University's administration and communication purposes, e.g. Faculty news, activities, giving initiatives, courses and programmes. The Faculty will not disclose any personal information to external bodies unless you have been informed or the Faculty is required to do so by law. If you do not wish to receive emails from the Faculty in future, please let us know at enews@mail.engineering.hku.hk.