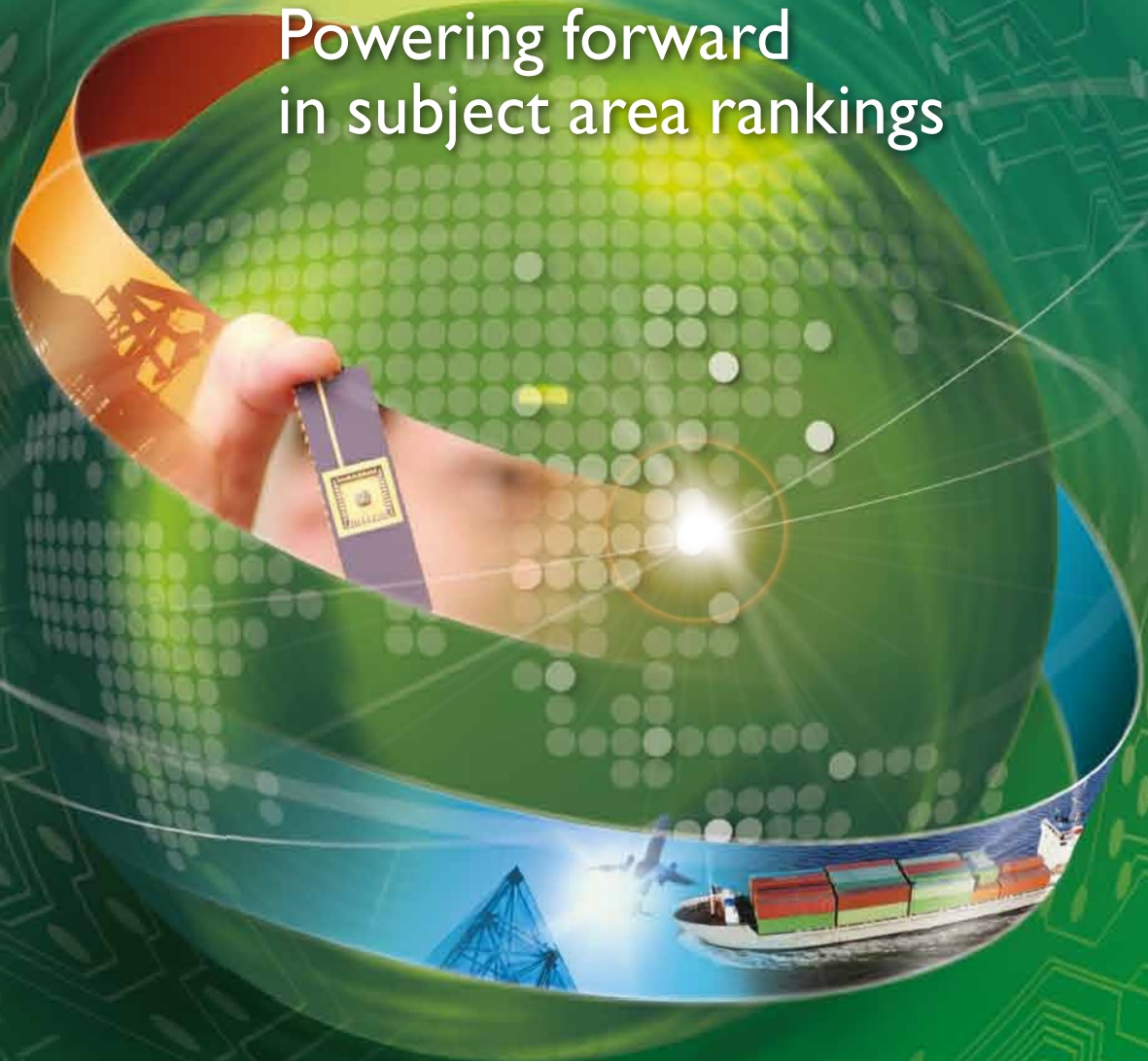


A SCHOOL OF ALL-ROUND STRENGTH

Powering forward
in subject area rankings



The School has added considerably to its global presence in recent months. We have been delighted to see the hard work and comprehensive strength of our departments recognized through our high global rankings in individual subjects in engineering and technology fields. We have also expanded our research and development capabilities, with the significant addition of the HKUST-NIE Social Media Lab, which will enable us to lead the way in exploring people's future interaction with communication and information technology and is the first of its kind in Asia.

Our world-class standing is set to be further reinforced through the revitalization of our undergraduate curriculum as Hong Kong moves to a four-year degree system in Fall 2012. We expect our pioneering approach to usher in a fresh and exciting era of engineering education in Hong Kong and beyond.

In developing our approach, we have sought to embrace the complete student experience. While we have focused great attention on the design and provision of new academic courses, we have also recognized the critical importance of support and wider development opportunities for a person to achieve their potential.

One key example is the additional academic advisory support we have been busy putting into place.

Academic advisement

The introduction of 334 brings much greater flexibility for students to choose the courses they take to obtain their degree. It is essential that students receive solid assistance in this area. However, our cutting-edge advisory system will encompass much more. Our aim is to help undergraduates make a smooth transition from school to the University, from their first-year introductory studies to their major program, and eventually from the University to their careers.

Our four main areas of focus are academic, social, personal-emotional, and institutional attachment, which together should provide the critical, all-round support to create a truly transformative learning experience at the School. We want to help students to choose programs that best fit their interests and aspirations, and to enable them to set and attain academic, personal and career goals.

As an illustration of our innovative support system, we have decided to divide our first-year engineers into "clans". There will be nine in total. Each comprises a clan fellow, a clan chief, and school-level advisors, all of whom are faculty

members. Student peer mentors and a professional advisor are also included in every clan.

Community connections

Along with the expansion of our internal support systems, we are also keen to offer our students more opportunities to learn about life outside the campus and to use their knowledge to assist others.

Through our Global and Community Engagement Program, students can gain a broader perspective on their studies and how they can apply their skills to solve challenging issues facing different people in Hong Kong and the world at large. In this issue of *In Focus*, we highlight several ways in which students have already been contributing their engineering knowledge in this way. In addition, the program encourages engagement at the international level, providing exposure to professional activities and peers outside Hong Kong.

We are also strengthening internship and industrial engagement to ensure a mutually beneficial experience for employers and students. Companies can learn at first-hand about our dynamic young engineers and students gain hands-on experience and familiarity with working practices. This should provide confidence and a competitive edge when undertaking a job search, and in the transition to the workplace – helping to realize another of the goals of our advisory support system.

Looking ahead

In addition to our undergraduate initiatives, we are moving forward in the education experience we provide for our postgraduates. We already attract some of the brightest minds from around the world to our research programs and have been making strong efforts to internationalize further. We are also seeking to broaden and deepen the range of learning activities our postgraduates enjoy through studying at the School. Along with working together with our top faculty on leading research projects, we have been building more opportunities for research exchanges, communication and presentation skills training, and career planning.

As we continue to add to our many high-achieving activities and our far-sighted education at both undergraduate and postgraduate levels, I look forward to the School making further pioneering contributions to the engineering community and the world at large, now and for the generations ahead.

Prof Khaled Ben Letaief
Dean of Engineering



Administrative■ **Prof Guohua Chen**

Appointed Head of Department of Chemical and Biomolecular Engineering
Professor, Chemical and Biomolecular Engineering

■ **Prof I-Ming Hsing**

Appointed Head of Division of Biomedical Engineering
Professor, Chemical and Biomolecular Engineering

**Faculty Members**■ **Prof Kai Chen**

Assistant Professor, Computer Science and Engineering
PhD – Northwestern University

■ **Prof Zhengtang Luo**

Assistant Professor, Chemical and Biomolecular Engineering
PhD – University of Connecticut

■ **Prof Qi Qi**

Assistant Professor, Industrial Engineering and Logistics Management
PhD – Stanford University

Adjunct Faculty■ **Prof Justin Chuang**

Professor, Electronic and Computer Engineering
PhD – Michigan State University

Visiting Faculty■ **Prof Ka Yip Fung**

Research Assistant Professor, Chemical and Biomolecular Engineering
PhD – The Hong Kong University of Science and Technology

Research

School's Academics Honored in National Accolades

Four School of Engineering (SENG) research advances were among the five HKUST projects to receive prestigious State Science and Technology Awards, the highest accolade in these fields in China. The awards for 2011, announced earlier this year, saw HKUST collect the largest number among tertiary institutions in Hong Kong. The honors are conferred by the State Council for significant contributions to the development of science and technology.



SENG academics received three State Natural Science Awards – Second Class for their pioneering research. Their areas of study covered range-free localization for wireless networks and internet of things (Prof Yunhao Liu; Prof Lionel Ni, Chair Professor; Dr Mo Li; Dr Zheng Yang; Computer Science and Engineering); stochastic models and performance optimization for computer network resource management (Prof Bo Li, Computer



Science and Engineering); and behavior-based spatial temporal features of urban traffic flow distribution (Prof Hai Yang, Civil and Environmental Engineering).

One State Scientific and Technological Progress Award – Second Class was

also awarded for research on the integration of software technology, users and their environment (Prof Shing-chi Cheung, Computer Science and Engineering). The fifth award went to a life science research project (Prof Nancy Ip, Dean of the School of Science).



In conducting their research and development, the SENG academics often worked with researchers at leading mainland universities, some over many years, building ties and fostering new perspectives.

HKUST President Prof Tony F Chan was delighted by the awards, which he said demonstrated the University's outstanding work in frontier and applied research.



Celebrating SENG's Dynamism

The second School of Engineering Research Excellence Awards were announced in May, recognizing the tremendous impact and contribution of faculty members at different stages of their academic career

Distinguished Research Excellence Award



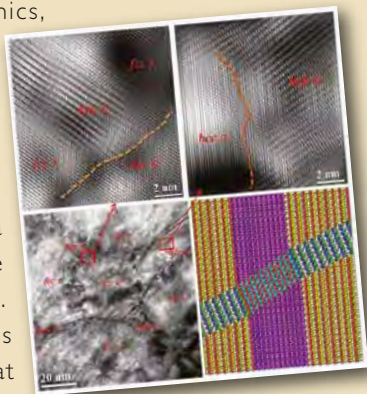
Prof Tongyi Zhang
Mechanical Engineering

The award honors a member of faculty with exceptional research achievements and significant impact locally and globally. It is the most prestigious of the SENG Research

Excellence Awards, with the winner invited to deliver a public lecture, a distinction in itself.

Prof Zhang, who gained his PhD at the University of Science and Technology Beijing, joined HKUST in 1993. During his time at HKUST, he has undertaken leading research in the interdisciplinary area between materials science and solid mechanics, with his work having significant impact on the academic world.

Areas he has shone fresh light on include piezoelectric fracture, micro-nanomechanics, mechanical characterization of thin film, diffusion and permeation, among other areas. He has been awarded numerous international honors and was recently elected a member of the Chinese Academy of Sciences. Membership of the Academy is the highest academic title that can be conferred on a scholar by the Chinese government for achievements in science and technology. He is also Director of the Hong Kong-Beijing UST Joint Research Center.



Honorable Mention

In addition, Prof Gordon McKay, Chemical and Biomolecular Engineering, received an Honorable Mention in the Distinguished Research Excellence Award category in recognition of his outstanding achievements.

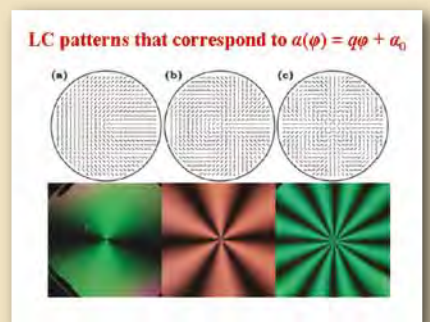
Research Excellence Award



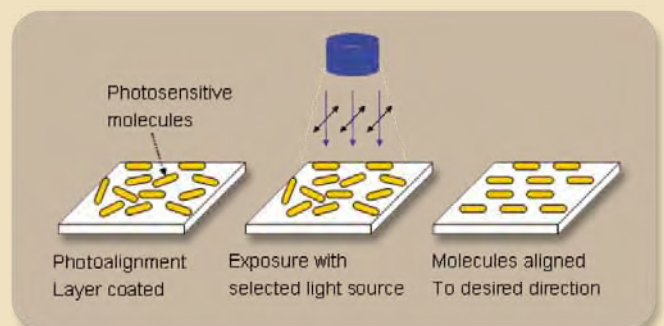
Prof Vladimir Chigrinov
Electronic and Computer Engineering

This award is presented in recognition of the contributions made by an outstanding faculty member with a proven record of research excellence.

Prof Chigrinov gained his PhD in solid state physics (liquid crystals) from the Institute of Crystallography, USSR Academy of Sciences. He is an expert in displays and photonics and has pioneered liquid crystal photoaligning technology for liquid crystal display (LCD) technology. His co-authored paper "Surface-Induced Parallel Alignment of Liquid Crystals by Linearly Polymerized Photopolymers", which appeared in *Japanese Journal of Applied Physics* in 1992, is the journal's fourth most heavily cited article.



Photoaligning technology was announced by a major consumer electronics company as the technology on which the new generation of LCD televisions will be based.



■ Research Excellence Award



Prof Hai Yang

Civil and Environmental Engineering

Prof Yang gained his Doctor of Engineering degree at Kyoto University and is a leading academic with top publications and citations within the transportation field.

He is internationally renowned for his innovative contributions to analysis, modeling and optimization of transportation systems and the economic analysis and modeling of urban taxi services. Other research interests include road pricing and traffic and transport dynamics.

Prof Yang was awarded a State Natural Science Award, Second Class by the central government's State Council in 2011. He also recently became the Editor-in-Chief of *Transportation Research Part B*, a leading transportation journal.



■ Young Investigator Research Award



Prof Ke Yi

Computer Science and Engineering

This honor celebrates the achievements of a rising faculty member. The accolade was conferred on Prof Yi for his research on big data algorithms, in particular data sets that

do not fit in a single computer's main memory. His work has seen him make theoretical and practical contributions to problems such as B-trees, hashing, R-trees and similarity searching. He has also studied algorithms in distributed systems such as MapReduce, Hadoop, and sensor networks, solving important problems that have attracted the attention of those in academia and industry.

Prof Yi received his PhD in Computer Science from Duke University, US. He is the Postgraduate Programs Coordinator and a member of the Theoretical Computer Science group and Database group at HKUST.



The Decision-Makers

The SENG Research Excellence Awards are determined by the Engineering Research Awards Selection Committee, comprising the head of each of the School of Engineering's six departments, chaired by HKUST Vice-President for Research and Graduate Studies Prof Joseph H W Lee. Co-opted members include distinguished figures from the HKUST Institute for Advanced Study and Professors Emeriti.

Nominees are put forward by their peers in the School, which currently has around 160 faculty members across its departments. Criteria for the awards include research output, originality and innovativeness; impact of research output on society, industry and the relevant engineering discipline, research training provided to students and their leadership role in collaboration with national and international research partners.

Award-Winning Recognition for Pioneering Studies

Leading projects on geotechnical breakthroughs and technologies to support future wireless communication saw School of Engineering scholars collect two out of three top science and technology honors awarded to HKUST by the Ministry of Education.

The Awards for Research Excellence in Natural Sciences 2011, announced in March 2012, extend across all tertiary institutions in China and provide further national recognition of the distinguished work being carried out by HKUST researchers.

A First Class award in Natural Sciences went to Prof Limin Zhang and Prof Wilson Tang (deceased), Civil and Environmental Engineering, for their ground-breaking work on reliability analysis and risk control for geotechnical structures in hydraulic engineering. The research has been successfully applied in the design of large hydropower projects in Sichuan and landslide risk mitigation in Hong Kong.

In addition, Prof Qian Zhang, Computer Science and Engineering, received a Second Class award in Natural Sciences for her significant basic research on Orthogonal Frequency Division Multiplexing (OFDM)-based wireless communications. OFDM is set to be one of the core technologies for wireless communications in the years ahead.



Prof Zhang worked with collaborators from several top mainland universities to discover ways to overcome defects in existing static spectrum management and improve utilization efficiency.

Another Second Class award went to academics in the Division of Life Science for their systematic analysis of traditional Chinese medicine formulas.

Joint Center Opens in Foshan



In a significant boost for HKUST engineering technology transfer and Pearl River Delta economic development, the HKUST LED-FPD Technology R&D Center in Foshan, Guangdong, opened in March to undertake innovative research on light-emitting diodes (LED) and flat panel displays (FPD).

The state-of-the-art Center is the result of an enterprising joint initiative by HKUST and Nanhai District Government of Foshan City. The Nanhai Government has provided start-up funding of RMB25 million and 1,800 square meters of space, including infrastructure and laboratory equipment, while HKUST is providing technology and management resources. The Director of the Center is School of Engineering faculty member Prof Ricky Shi-wei Lee, Mechanical Engineering.

The Center seeks to enhance research and characterization standards and provide consultancy services to industry. It will

Breakthrough Solutions to Global Challenges

School of Engineering researchers have achieved significant advances in networking and information analytics technology in a collaboration between HKUST and global technology giant HP. The cutting-edge research projects, led by Prof Gary Shueng-han Chan and Prof Lei Chen, Computer Science and Engineering, focus on a wireless multi-hop network which provides wider bandwidth coverage range and an information analytics solution with a new probabilistic approach respectively.

HKUST was the only Hong Kong institution to receive two awards in the fourth annual HP Labs Innovation Research Program in September 2011. The program creates opportunities for leading tertiary institutions worldwide to conduct research with HP. HKUST's projects were among 62 selected from 626 proposals from 525 researchers.



The wireless multi-hop network, commonly known as a wireless mesh network, has opened the way for an advanced, reliable, cost-effective network that can be deployed in complex environments such as cities, enclosed buildings, airports and container terminals.



The information analytics project tackles another global technological challenge: the storage and analysis of the enormous amount of data now becoming available. The research proposes new solutions to build a context-aware web portal that can compare data from various online sources. The introduction of a probabilistic approach enables all possible facts to be kept during data integration for maximum accuracy and clearer insights, assisting better decision-making.

HKUST and HP have also been working together to promote innovative education in science, technology, engineering and math (STEM) through the HP Catalyst Initiative. A team led by Prof Chen and Prof Mounir Hamdi, Head of Computer Science and Engineering, is providing insight on how STEM competencies can be assessed and measured by technology.

leverage the energy-efficient and environmentally friendly aspects of LED technologies and focus on applied research, developing LED packaging as its core technology.

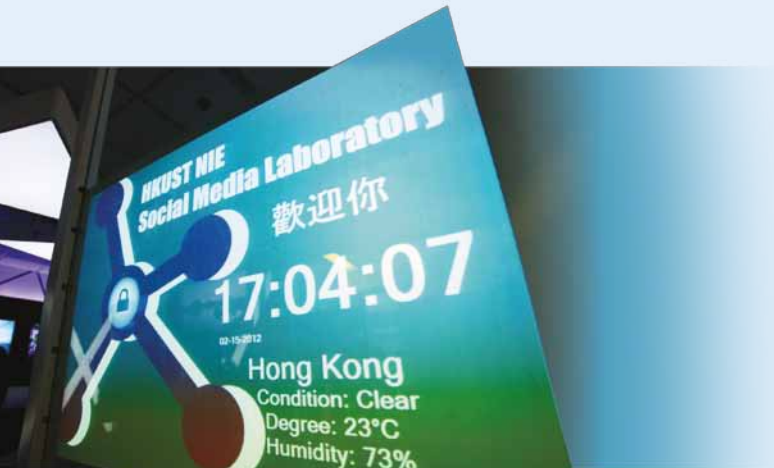
Prof Lee noted that the Pearl River Delta region housed a cluster of upstream, mid-stream and downstream LED enterprises and was a hub of LED packaging and investment. He said the Center's expertise in R&D and technology transfer will help enhance competitiveness, creating favorable conditions for the industries' long-term development.

Services at the center include material preparation and characterization, simulation and modeling, chip level packaging prototyping, board level assembly prototyping, optical, electrical and thermal characterization, reliability testing, failure analysis, and technical training.

Among the guests at the Opening Ceremony were mainland government officials and members of the HKUST administration, including President Prof Tony F Chan. The University and Nanhai Government also signed a Memorandum of Understanding on collaborations, technology transfer and talent development in Foshan and Hong Kong.



‘Slide’ to Share Information in the Cyber-Physical Era



The leading-edge HKUST-NIE Social Media Lab showed it was ahead of its time even before its official opening in February 2012, with the development of frontier portable multi-touch technology in late 2011.

The Lab is Asia's first research laboratory specializing in the study of social media culture and technologies. The focus is on research and design of next-generation social media systems, networks and applications. The social media research powerhouse, which seeks to put Asia at the forefront of advances in the field, has been established by the Department of Electronic and Computer Engineering, with Prof James She appointed the Director.

“We want to analyze the phenomenon of physical social networks, online social networks, and mobile social networks,” Prof She told *In Focus*. “But we will not only work on theories. Like the MIT Media Lab or the Computer Laboratory at

Cambridge University, we are looking to explore and build creative systems. In particular, we are exploring cyber-physical social network systems, which we see will be the wave of the future.”

Cyber-physical systems involve the combination of and coordination between computational and physical elements. For instance, the Lab's exciting multi-touch enabler can retrofit ordinary glass in existing windows, turning them into interactive environments – similar to a touch screen – and allowing people to share information in novel ways. Its researchers have also developed an app technology called “slide”, which allows users to generate content through interaction between the glass and their mobile device.

Other major areas for research include social analytics for viral media broadcasts in social networks; cloud-based social network analysis and data visualization; big data systems for social media delivery, processing and storage; social and mobile internet protocol television (IPTV); and cyber-physical arts and media production. Related emerging technologies range from out-of-home interactive and sensing digital signage to wearable devices.

Collaborations with major partners, including OpenRice, Next Media, CyPhy Media, Turner Broadcasting System, Research in Motion and CyberPort digital community, are already underway. As content can cover many areas, the Lab is also working closely with social scientists, multi-disciplinary researchers, artists, and media technology practitioners.

Working Together to Improve What We Wear

Prof Ravindra Goonetilleke, Industrial Engineering and Logistics Management, is collaborating on an innovative online thermal manikin laboratory project in which anyone, anywhere in the world, can participate.

Working with health scientist Prof Uwe Reischl, Boise State University, Idaho, US, and Reach-in, a technology service provider which conducts experiments and explores internet medicine in a real-time situation, Prof Goonetilleke is measuring the thermal characteristics of protective clothing worn by people involved in hot outdoor activities in different climates. The online experiment has been set up in a way that allows the start-up of a manikin, adjustment of the required variables, and testing of the insulation of various types of garments from a remote location without physical presence.

The research has already contributed to the development of clothing systems for those working in agriculture. The garment

design principles can also be used by athletes and others in hot outdoor environments. For further details, visit www.reach-in.com/demos/conduct-an-experiment.



Subject Rankings Reinforce **Top-Tier Standing**

HKUST has remained at the forefront of global rankings for engineering and related fields in various international surveys, with impressive rises in individual engineering areas.

In the QS World University Rankings by Subject 2012, five HKUST engineering subjects leapt into the global top 20. Computer Science (13th), Electrical Engineering (17th), Civil Engineering (18th), Mechanical Engineering (19th) and Chemical Engineering (20th) all rose, jumping between 11 and 32 places from the previous year. Computer Science, Electrical Engineering and Chemical Engineering were ranked first in Greater China, while Mechanical Engineering was first in Hong Kong.

Dean of Engineering Prof Khaled Ben Letaief said such rankings' success was a reflection of the School's ability to attract a critical mass of outstanding faculty and researchers, including over 20 IEEE Fellows. With its world-class academic team, the School was able to drive forward cutting-edge, quality research projects as well as develop innovative teaching concepts and practices. Top research facilities and the dynamic research atmosphere also fostered excellence.

The School has been pioneering the way in interdisciplinary research in areas such as energy and the environment. In addition, it has used Hong Kong's move to a four-year degree program to broaden its undergraduate programs and enhance exchange and internship opportunities for students. After the first Hong Kong Diploma of Secondary Education examination results were released, the School admitted the largest number of students attaining the top grade of 5** among local engineering schools.

In the QS World University Rankings by Faculty, HKUST was again first in Hong Kong in Engineering & Technology in 2012, and ranked 27th globally. In the Academic Ranking of World Universities in Computer Science 2012, HKUST was in first place in Greater China, and placed 26th globally. In the Academic Ranking of World Universities in Engineering/Technology and Computer Sciences, HKUST was ranked 38th worldwide in 2012.

2012 QS World University Rankings
27 Globally
in Engineering and Technology

No. 1 in Hong Kong

2012 QS World University Rankings

13 Computer Science*
17 Electrical Engineering*
20 Chemical Engineering*
18 Civil Engineering
19 Mechanical Engineering

***No. 1** in Greater China



International Collaborations Foster Joint Programs

Agreements between HKUST and two prestigious overseas universities are set to open further opportunities for the School of Engineering to engage in enterprising collaborations and raise its international profile.

A Memorandum for Cooperation and an Academic, Scientific and Cultural Cooperation Agreement was signed with École Nationale Supérieure des Mines de Saint-Étienne (ENSMSE), France. The school is one of the longest established in France and among the country's top 10 graduate schools in engineering.

The memorandum will see HKUST and ENSMSE working together to develop joint activities and programs that will facilitate academic, scientific and technological exchange and cooperation in engineering and science.

The cooperation agreement aims to develop joint programs in teaching and student training. Areas may include joint PhD programs, joint research projects, joint courses and curricula, seminars, student exchanges, and visits.



HKUST also boosted its ties with Sharif University of Technology, Iran, with an agreement to establish a joint PhD program in engineering. The two universities had signed a Cooperation Agreement in 2010.

The exciting new move will enable PhD students to engage in academic exchange at both universities and gain a global perspective. Sharif University is a top university in Iran, with a strong reputation in the Middle East. Undergraduate admission is limited to the top 5% of students who pass Iran's national entrance examination.

The joint PhD program will run over four years, with students spending two years at each university. Students will have an advisor at each institution, with a plan developed for the research before the student starts the program.



Faculty Honors, Awards and Achievements

- Prof Kei May Lau, Electronic and Computer Engineering, won the second prize in the Guangdong Province Science and Technology Awards 2012 for her project entitled "GaN-Based and the Development of AlGaInP-Based LED". The study was completed in collaboration with Prof Guanghan Fan, Director of the Metalorganic Chemical Vapor Deposition (MOCVD) Laboratory at South China Normal University.



- Prof Ricky Lee, Mechanical Engineering, received an Outstanding Paper Award at the 12th International Conference on Electronics Packaging in Tokyo in April 2012. The paper, "Investigation of PWB Laminate Resin and Its Relation with the Pad Cratering Resistance", was co-authored by postdoctoral fellow Dr Fubin Song and PhD student Chaoran Yang.

- Prof Irene Lo, Civil and Environmental Engineering, and her former PhD student Prof Kelvin Ng have been awarded the 2012 Best Practice-Oriented Paper Award for all American Society of Civil Engineers (ASCE) Environmental & Water Resources Institute journals.



- A paper by Prof Huihe Qiu, Mechanical Engineering, was selected as a Highlight of 2011 by the *Journal of Micromechanics and Microengineering*. "Effects of Acoustic Vibration on Microheater-Induced Vapor Bubble Incipience in a Microchannel" was co-authored with PhD graduate Dr Xiaopeng Qu, 2010 Mechanical Engineering.



- Prof Limin Zhang, Civil and Environmental Engineering, has been elected a Fellow of the American Society of Civil Engineers (ASCE). His research interests include geotechnical risk and reliability, embankment dams, landslides and debris flow, centrifuge modeling and numerical methods. The ASCE represents more than 140,000 members of the civil engineering profession worldwide. Less than 5% of the total ASCE membership holds Fellow status.



- Prof Qian Zhang, Computer Science and Engineering, was awarded the Electronics Information Science and Technology Award, 1st Class, by the Chinese Institute of Electronics. She received the award for her collaborative work with Tsinghua University researchers on wireless multimedia transmission model and performance optimization.

Innovation on Show in President's Cup

There was a clean sweep of the awards in the President's Cup 2012 for School of Engineering student teams, which received the overall winning honor, gold and silver awards. The President's Cup is an annual HKUST event for undergraduates to compete for awards based on outstanding achievements in research and innovation. The contest seeks to encourage students' creativity and to help participants to build their presentation and communication skills.

The top prize went to a Chemical and Biomolecular Engineering team for their project on the processing of high-performance porous membranes for fuel cell applications. The team comprised Fung Chu Li, Bowen Sun (Dual Degree Program), Hon Ting Wong, and Lang Xu, and was supervised by Prof Ping Gao.



A team of students from Computer Science and Engineering, Electronic and Computer Engineering, Computer Engineering Program, and the Dual Degree Program received the gold award for their work on enhancing internet transaction security with fingerprint recognition. Team members Kannan S Chandrasegaran, Shrikant Patnaik, Sagar Nilesh Shah and Saurabh Swarup were supervised by Prof Cunsheng Ding, Computer Science and Engineering and Prof Bing Zeng, Electronic and Computer Engineering.

Another Chemical and Biomolecular Engineering team gained the silver award for their project on in situ hydrogel for cosmetic injection. Students Pik Kei Lam, Kai Qi Yan, Feiran Yi, and Siu Man Yip participated, supervised by Prof Ying Chau.

Early Researchers Shine

School of Engineering undergraduates have turned early research opportunities with HKUST's renowned academics into prize-winning studies, taking three of the top awards in the 2012 Mr Armin and Mrs Lillian Kitchell Undergraduate Research Award Competition.

The signature Undergraduate Research Opportunities Program (UROP) leverages HKUST's expertise as a globally renowned research institution to provide students across the University with a significant opportunity to engage in academic research ahead of graduation. All students who successfully complete a UROP course can be nominated for the research award contest.

Computer Science and Engineering undergraduates Qifeng Chen and Yuliang Li came first and joint third respectively in this year's competition, which awards honors based on the quality of students' written reports and their performance at the final presentations.

Qifeng's winning project focused on "KNN Matting", with the paper exploring a general alpha matting approach for the simultaneous extraction of multiple image layers. An application for such work is to make it easy to replace a background. The paper was accepted by the prestigious Computer Vision and Pattern Recognition (CVPR) 2012 conference held in Rhode Island, US, in June. In addition to attending the conference, Qifeng, who was supervised by Prof C K Tang, has accepted a PhD offer from Stanford University.

Yuliang received a second runner-up award for his project "Mining Generalized Order-Preserving SubMatrices from Gene Expression Data", supervised by Prof Wilfred Ng. The project explored the Order-Preserving SubMatrix (OPSM) pattern, which had previously been shown to be an effective tool for analyzing gene expression data.

First-year Mechanical Engineering student Zhiwei Qiu received the first runner-up award for his outstanding achievements in the project "SnO₂/Graphene Nanocomposite as an Anode Material in Lithium-Ion Batteries", supervised by Prof Jang-Kyo Kim.



Teams Triumph in Sustainability Contest



School of Engineering student teams gained three major awards at the Hong Kong Institution of Engineers (HKIE) Joint Institutes Competition, held in Spring 2012. The theme of the contest was "Shape Our Sustainable Campus", with a total of 14 teams taking part.

Showing their strong environmental awareness, Chemical and Biomolecular Engineering students Jeromy Chun Yuen Chan, Karen Pik Shuen Hung, Ho San Mak, and Lawrence Kai Qi Yan of the CBME team won the gold award for their proposal to increase HKUST sustainability. This included converting leftover food into fertilizer and using empty rooftops on academic buildings and dormitories for farming.

Electronic and Computer Engineering student Fisher Ye Yu won silver for his sea water cooling system while Ming Kin Kwok and Lai Ping Wong of the Green Piece team from the same department received a merit award for their paper recycling reward scheme.

The competition was organized by the Young Members Committee of the HKIE, and the HKIE Student Chapters of HKUST, City University of Hong Kong, Hong Kong Institute of Vocational Education (Sha Tin) and Hong Kong Institute of Vocational Education (Tsing Yi).

Transforming Ideas into **Business Start-Ups**

The enterprising spirit inspired by studying at the School of Engineering was on full display in the HKUST One Million Dollar Entrepreneurship Competition in May, with engineering students and alumni winning the first three prizes and many others from the School among the 12 teams to reach the finals.

The first prize was secured by Neoid Ltd for its high-performance RFID tagging solutions. The company includes Mechanical Engineering and Electronic and Computer Engineering alumni. The first runner-up was Green ACE, comprising Mechanical Engineering PhD alumni and students. The team put forward a proposal to build energy-efficient cooling systems for buildings and industrial applications powered by solar and waste heat. The second runner-up was iTorr, made up of Mechanical Engineering PhD students. This group focused on diagnostic and treatment devices for the eye, and the production and marketing of patented products to clinical professionals.

In total, the competition attracted 89 teams made up of faculty, staff, students and alumni from the Schools of Science, Engineering and Business & Management. More than 50 leading executives, professional investors and entrepreneurial academics formed an international judging panel to select the

finalists after rounds of rigorous competitions. Total awards in the competition amounted to HK\$1 million.

Among other accolades for engineering students, the Student Prize went to Abacus Ltd, a cloud service provider for scientific computing problems. The company is led by an Electronic and Computer Engineering PhD student, with a Computer Science and Engineering MPhil student as the Chief Technology Officer.

The competition was supported by a number of sponsors, including the Shui On Group, Sonivy Technology Ltd, Google Technology Ltd, DJI Innovations and WebNova Ltd.



Communication App for Médecins Sans Frontières

Computer Science and Engineering student volunteers Li Tao, Yaofeng Zhang, and Guanlun Zhao have implemented an Android app for Médecins Sans Frontières (MSF)-Hong Kong, a charity, to increase awareness and boost fundraising efforts.

MSF delivers emergency aid to people affected by armed conflict, epidemics, natural disasters and exclusion from healthcare and currently works in around 70 countries. The app provides access to MSF's latest field news, photos and

videos as well as frontline sharing by MSF field workers. It supports English, traditional and simplified Chinese and is free to download.

According to Alan Cheung, Web and Social Media Specialist, MSF-Hong Kong, the application was MSF's first Android app worldwide and "would definitely help MSF to reach out to the new generation". The students were supervised by Prof Jogesh K Muppala.



Awards Demonstrate Creativity in Action

School of Engineering students and graduates received community recognition of their creativity with three teams gaining accolades at the Hong Kong ICT Awards 2012.

Ho Sum Lee (Year 3, Mechanical Engineering), Chun Yin Leung (MPhil student, Electronic and Computer Engineering) and Ka Kin Wong (Year 3, Mechanical Engineering) collected a Best Innovation & Research (College & Undergraduates) Bronze Award for their modular-based underwater robotic system. Steve Weipeng Zhuo (MPhil) and Jeffrey Siu Lung Lui (2011 graduate), both Computer Science and Engineering, also received a bronze award in the same category for their innovative multi-hop wireless network.

A third team comprising David Ka Chun Cheung (Year 3), Tim Chun Yim Wong (2011 graduate) and Jason Siu Hung Yuen (2011 graduate), all Computer Science and Engineering, received a Best Innovation & Research (College & Undergraduates) Special Mention - Social Responsibility. The team came up with an Android app providing an online Google Map with audible Cantonese place names for expats and tourists in Hong Kong. The team also received a Prize for Innovative Spirit for this project in the Lenovo Innovative Design Competition 2011 for local university students and researchers.



Student Honors, Awards and Achievements

- It has been an exciting winter and spring for the Remotely Operated Vehicle (ROV) Team, a sub-team of the HKUST Robotics Team. In November 2011, the team received a Merit Award in the Tertiary Student Project category at the 11th International Asia Pacific ICT Alliance (APICTA) Awards. The awards event aims to spur ICT innovation and creativity in the region. In April 2012, the team's underwater robot qualified for the 2012 MATE International ROV Competition in Florida, where the HKUST students were able to meet up with teams from around the world. Thanks go to DHL Express for logistics consultation and for sponsoring the robot's transportation and to RS Components for sponsoring the electronic components and equipment.



- A Computer Science and Engineering programming team advanced to the ACM-ICPC World Finals 2012 after a strong showing in the Asia regional heats for the ACM International Collegiate Programming Contest (ACM-ICPC). The HKUST Optimus Prime team came second in the Phuket round and third in the Fukuoka round. It was the second consecutive year that a CSE team reached the world finals and the fourth time overall.
- Doctoral candidate Hong Cai, Electronic and Computer Engineering, won the Best Student Paper Award (Champion) at the 12th IEEE Photonics Society Hong Kong Chapter Postgraduate Conference in December 2011. Her winning paper was entitled "Optical Manipulation of Micro and Nanoparticles Using Multimode Interference Power Splitters", co-authored with Prof Andrew W Poon. The paper was selected from 22 postgraduate research submissions.



Toys'R'us to Sell IELM-Designed Products

Two groups of final-year Industrial Engineering and Logistics Management (IELM) students successfully undertook product design projects for Toys'R'us, the worldwide chain store, with the company going on to obtain a license to develop and market the new toys. The first student group comprised Cheuk Yee Chung, Fung Man Lam, and Lee Na Tam while the second group was composed of Ming Wa Cheung, Shu Cheong Lam, Heung Ming Wong, and Hiu Tan Yu. The toys are due to go on sale later this year. The students were supervised by Prof Ravindra Goonetilleke, with each project taking around nine months.

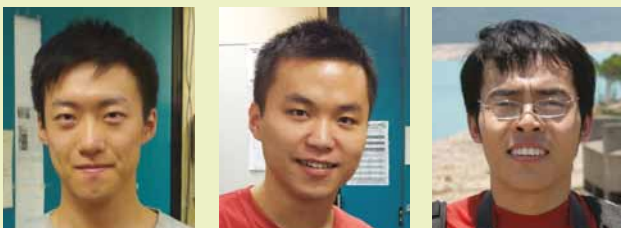


Student Honors, Awards and Achievements

- PhD student Jie Dai, Computer Science and Engineering, and Prof Bo Li received the Best Paper Award at IEEE GLOBECOM 2011 in Houston, US, for their work on “Collaborative Caching for Video Streaming among Selfish Wireless Service Providers”. Their study was partly supported by Huawei. IEEE GLOBECOM is the IEEE Communications Society flagship conference.



- Three Electronic and Computer Engineering postgraduate students received Best Paper Awards at the IEEE Student Symposium on Electron Devices and Solid-State Circuits in December 2011 in Hong Kong. MPhil student Xiaohao Hu's award-winning paper was entered in the Solid-State Circuits category and entitled “An Efficiency-Enhanced Operation Scheme for Non-Inverting Buck-Boost DC-DC Converter”. It was co-authored with Prof Philip Mok and Dr Xiaocheng Jing. Fan Yang was also recognized in the Solid-State Circuits category for the paper “An Industrial Multi-Node Network Design Based on DC Power Line Communication”, co-authored with Prof Philip Mok. Lining Zhang gained an award in the Electron Devices category for a paper on “Statistic Variations in Vertically Stacked Silicon Nanowire Transistors”, co-authored with Prof Mansun Chan. Both are PhD students.



- Ka Wo Lam and Tsz Him Mak, both Year 3, Electronic and Computer Engineering, won the Bronze Award in the Design for Elderly Competition 2012 (Product Design for Elderly Division). The pair, together with a student from the School of Science, designed a cost-effective wireless lighting device for the elderly. The contest enables students to explore their potential and raises awareness about the needs of the elderly among young people.



- PhD candidate Li Li, Industrial Engineering and Logistics Management, received second prize in the Best Student Paper Competition at the Third POMS-HK International Conference, organized by the Production and Operations Management Society – Hong Kong Chapter. The paper was entitled “Proactive Transshipment Coupled with Price Commitment Postponement Does More Than Stock Balancing”.



- MPhil student Chi Yan Tso, Civil and Environmental Engineering, received the Arup Research Prize 2012 for his contribution to the development of a composite adsorbent for a waste heat powered adsorption cooling system.



- A paper by PhD student Liang Wu, Electronic and Computer Engineering, was accepted for presentation at the 2012 International Solid-State Circuits Conference (ISSCC). The annual conference, also known as the “Chip Olympics”, is the most prestigious forum for presentation of advances in solid-state circuits and systems-on-a-chip. The paper examined “A 4-Path 42.8-to-49.5GHz LO Generation with Automatic Phase Tuning for 60GHz Phased-Array Receivers”. The conference was held in San Francisco in February 2012.



- Fuxin Zhuang, Year 3, Electronic and Computer Engineering, won second prize in the IEEE Hong Kong Section 2011 Student Paper Contest for his paper “Signal Processing for Interference Mitigation in MIMO Networks: Cooperative Base-Stations and Linear Receivers”.



A Legacy of Excellence and Future Success Stories

Recent months have seen the setting up of memorial funds in honor of two senior academics to help others extend the pioneering work they initiated

Prof Wilson Tang

The Professor Wilson Tang Memorial Fund has been established at HKUST in remembrance of Prof Wilson Tang, former Head of Civil and Environmental Engineering, and to encourage next-generation innovators. The Fund will provide scholarships and bursaries to both outstanding Civil and Environmental Engineering students and those in need of financial support. The awards will help to recruit future leading engineers, recognize top performance in courses related to uncertainty and risk assessment, which were Prof Tang's major areas of research, and assist students in joining the overseas exchange program. Prof Tang passed away in January after a long illness.

Born in Hong Kong, Prof Tang completed his high school education at La Salle College before moving to the US for Bachelor and Master's studies at MIT and a PhD at Stanford. He taught at the University of Illinois at Urbana-Champaign for 27 years before joining HKUST as Chair Professor and Head of the Department of Civil Engineering. He served as Head from 1996 to 2001. Under his leadership, the Department evolved into one of the best in Asia. He enjoyed encouraging younger minds and mentored numerous graduate students and junior colleagues at both universities.

During Prof Tang's significant academic career, he advanced the profession by promoting and pioneering the use of reliability-based methods for risk mitigation and design in various areas, particularly geotechnical engineering. He led and served on several major international boards and committees. Among his many accolades, the Wilson Tang Lecture, a prestigious keynote lecture given at the International Symposium on Geotechnical Safety & Risk series of conferences, was inaugurated in 2009 to recognize and honor his contributions.

Prof Edmond Ko

Prof Edmond Inq Ming Ko, who passed away suddenly at home in April, was a great educator and mentor. As Senior Advisor to the Provost, Director of the Center for Engineering Education Innovation (E²I), and Adjunct Professor of Chemical and Biomolecular Engineering, many students, staff and faculty members sought his advice on matters large and small, and he was always willing to give. He was an alumnus of Pui Ching Middle School, the University of Wisconsin-Madison and Stanford University, and prior to joining HKUST, he taught and played leadership roles at Carnegie-Mellon University and City University of Hong Kong.



Prof Ko was also deeply involved in the formulation and implementation of education policy in Hong Kong. He was Chairman of the Curriculum Development Council and a member of the Quality Assurance Council of the University Grants Committee, Education Commission, Hong Kong Council for Accreditation of Academic and Vocational Qualifications and Council of the Hong Kong Institute of Education.

He said on numerous occasions that one of his major goals in life was to educate and bring out the best in the younger generation and the Professor Edmond Ko Scholarships for Student Mentoring are dedicated to a key contribution he made in this area. Keenly aware of the value of personal relationships in learning and the impact of mentors at every level of a learner's journey, these awards will recognize and support those who show: unusual commitment and dedication to mentoring their peers; success in supporting the learning and development of other students through their work as mentors; and advances in their own development through mentoring others.

Lawrence Lee

Mr Lawrence Lee, School Administrator (Development) in the Office of the Dean of Engineering, passed away in April after a courageous fight against acute myeloid leukemia. Mr Lee, a Chartered Engineer, joined HKUST in 1993 and made significant contributions to the School during his 19 years at the University. As Head of the Industrial Training Center, he helped to establish practical training provision for students to satisfy the requirements for international engineering professional recognition. He also played a leading role in planning the School's development, particularly in the areas of internship, placement, career and 334 co-curricular activities.

Bobo Kwok

We are also sad to report that Bobo Ka Hung Kwok, Technical Associate of Chemical and Biomolecular Engineering and HKUST alumnus, died unexpectedly at home in March. Mr Kwok received his Master's degree at the University in 1995 and joined the Department of Chemical and Biomolecular Engineering the same year. His technical skills and knowledge of chemical engineering greatly benefited faculty members and students over the years. He was also a model boat enthusiast and a winner of world championships in this area.

Cathay-MECH Pedal Kart Becomes a Winner

A four-wheeled human-powered pedal kart designed and built by the Department of Mechanical Engineering (MECH) for Cathay Pacific Airways saw the airline achieve a Race Winner Award in the Ladies' Division of the Hong Kong 24hr Pedal Kart Grand Prix charity race in February. The award-winning kart, pedaled by the "Cathay Angels", finished

778 laps in 24 hours in relay on a specially designed track in Victoria Park. The annual fund-raising event for local and regional charities was organized by the Association of Round Tables in Hong Kong.



Fostering Young Electronic Engineers

It has been a challenging and rewarding few months for Prof Mansun Chan, Electronic and Computer Engineering, who has been helping to raise awareness of school students about the contribution that engineers make to the way we live.

In December 2011, Prof Chan co-organized a three-day Electronic Winter Camp with the IEEE Hong Kong Electron



Devices/Solid-State Circuits (ED/SSC) Chapter, allowing more than 130 school students aged from 10 to 15 to experience the fun of electronic design. In April 2012, Prof Chan assisted in a community science and engineering education project, providing teaching material for the Science Development Program for Gifted Students, organized by Creative Primary School in Kowloon Tong.



Both projects received support from Love Ideas HK, part of a philanthropic campaign organized by the Li Ka Shing Foundation to unite the community in improving life in Hong Kong.

Exploring the World of an Engineer

Secondary school students were introduced to the multifaceted field of engineering as well as life at HKUST through three dynamic Engineering Exploration Day events, organized by the School on campus in November and May. Over 2,600 students attended in total.

A range of programs and activities enabled secondary school students to explore the many fascinating areas embraced by engineering and technology. These included talks on great ideas related to engineering, an introduction to engineering programs, lab and campus tours, and robot displays.

"Secondary school students learn about science and mathematics, but they do not have a chance to study engineering," said Prof Hong K Lo, Associate Dean of Engineering. He noted that the exploration days helped students become

aware of how engineering had shaped modern society and what the next exciting breakthroughs may be.



Delivering Insight into Android

Android expert Prof Jogesh K Muppala, Computer Science and Engineering, shared his knowledge and experiences with the community and across the University at two well-received recent events. Reaching out to Google technology enthusiasts from around Hong Kong, Prof Muppala gave a talk at the Hong Kong Google Technology User Group Day in December 2011.

In May 2012, Prof Muppala held his two-day Android application development workshop for HKUST students for the second consecutive year. Those attending learnt different aspects of designing an Android application through a series of structured hands-on exercises.



'Golden' Discussion on Technology and Its Social Impact in Hong Kong

A seminar entitled "What Is the Future of the Golden Value", organized by School of Engineering Student Ambassadors and featuring Mr Cho Shun Lam, CEO of Hong Kong Golden Forum, and Mr Yeung Tat Wong, novelist and online radio host, drew an audience of more than 230 HKUST students in April.

The two speakers discussed their views on the social culture that has developed from the Golden Forum, an online discussion platform that often uses parody, and the amended copyright bill.

The event was initiated by Head Student Ambassadors Roy

Ming Hin Chung, Computer Science and Engineering, and Jeff Ka Lok Li, Chemical and Biomolecular Engineering, and supported by the School.



Events Round-Up

- Around 40 leading Hong Kong and Mainland China academics gathered at Sun Yat-sen University in Guangdong in November 2011 for the Mainland-Hong Kong Operations and Logistics Management Forum, organized by the Department of Industrial Engineering and Logistics Management and alumni. Those attending the two-day event included representatives from HKUST, Chinese University of Hong Kong, City University of Hong Kong, Hong Kong Polytechnic University, Tsinghua University, Shanghai Jiao Tong University, Fudan University, and Zhejiang University.

- The School's Global and Community Engagement Program organized a seminar entitled "Raleigh - Get Out There" in February to inspire students to participate in local and international voluntary programs. Ms Lydia Leung, Electronic and Computer Engineering alumna and Vice Chairperson of Raleigh Hong Kong, a youth charity that helps young people to explore their potential through volunteer activities, introduced the organization and its goals. Two volunteers also shared their experiences and the impact of their 10-week program in Costa Rica.

- Prof Tim Woo, Electronic and Computer Engineering, launched an enterprising undergraduate joint project with Purdue University, US, involving internet remote-controlled

cars. Student teams at HKUST and Purdue each built a system to control model cars at the other's campus via the internet. The project provided a great opportunity for students to exchange ideas and learn from each other.

- Fundraising was at the fore as Electronic and Computer Engineering faculty members joined the popular Oxfam Trailwalker in November 2011. Undertaking the strenuous 100km charity walk as part of the ECE@HKUST team were Prof Mansun Chan, Prof Howard Luong, Prof Ross Murch, Prof James She, Prof Bert Shi, Prof Ling Shi, Prof Man Wong and Prof George Yuan. The team crossed the finishing line after 29 hours and 43 minutes, finishing second in the Education category. They also exceeded their fundraising goal by more than 10%.



Spotlight on Enterprising ICT Products

Two Electronic and Computer Engineering alumni who have set up their own businesses have received honors at the 2012 Hong Kong ICT Awards, which spotlight the achievements of the city's information and communication technology sector and creative solution-builders.



Eric Yung, MPhil in Electrical and Electronic Engineering and President of the HKUST MBA Alumni Association, received the Gold Award in the Best Lifestyle (Learning & Living) category for AURALBOOK, developed by his company, Playnote Ltd. The flagship product helps

students to acquire the aural skills required for music examinations at different levels in various countries in a revolutionary way. The patented interactive electronic music book works on mobile phones and tablet computers.

Yik Hei Chan, BEng in Electronic Engineering, gained the Bronze Award in the Best Lifestyle (Green, Healthy & Creative Living) category. His company, Bull-b Ltd, developed the iPad Menu application to enhance the efficiency of restaurant operations and management by using cloud computing technology.



Young Academics in the Spotlight of the Mainland



Three PhD alumni from Industrial Engineering and Logistics Management have been spotlighted in a National Natural Science Foundation of China article in the *Journal of Management Sciences in China* (September 2011 issue). The report reviewed the mainland China scholars' publications in leading international management science journals. A total of 11 papers were featured.

Ke Fu's "Optimal Component Acquisition for a Single-Product, Single-Period Assemble-to-Order System

with Expediting" was published in *Manufacturing & Service Operations Management*. It was co-authored with V N Hsu and CY Lee. Weixin Shang looked at "Promised Delivery Time and Capacity Games in Time-Based Competition", which appeared in *Management Science*. It was co-authored by L M Liu. Weihua Zhou co-authored "Optimal Control of an Assembly System with Multiple Stages and Multiple Demand Classes" with S Benjaafar, M Elhafsi and CY Lee. Their study appeared in *Operations Research*. Dr Fu and Dr Shang received their PhDs in 2006 and Dr Zhou graduated in 2007.

Honors and Achievements

■ PhD graduate Leon H Lu, 2011 Civil Engineering, came second in the prestigious international Huber Technology Prize 2012 for his PhD work on developing and demonstrating the Sulphate Reduction, Autotrophic Denitrification and Nitrification Integrated (SANI) process. SANI can reduce sewage sludge by 90% and treatment costs by 50%. Dr Lu worked with Prof Guanghao Chen at HKUST and a team of international academics. The award recognizes outstanding young researchers in innovative water technology development. The theme of this year's prize was energy from wastewater. It was presented in Munich, Germany, in May. Dr Lu was the only awardee from Asia.



■ MPhil graduate Kany SY Zhou, 2009 Mechanical Engineering, received the third prize in the Hong Kong Institution of Engineers (HKIE) Engineering Graduate Training Scheme "A" – Trainee of the Year Award 2011. Kany is a Hong Kong Productivity Council Associate Consultant (Automation Service Division), specializing in optics development and precision fabrication. She has delivered a number of industrial consultancy projects and government-funded research and development projects.



Exploring the Opportunities of Northwest China



Greater understanding of the role of technology and human resources have to play in the development of Northwest China was provided by Prof Zongben Xu, Vice President of Xi'an Jiaotong University (XJTU) and academician of the Chinese Academy of Sciences, at a major event co-organized by the School of Engineering and Interdisciplinary Programs Office in February as part of the HKUST Research Forum series.

"Challenge and Opportunity – Energy, Chemical & Environmental Technology and Science in the Development of the Northwest China" was hosted by Prof Jingshen Wu, Mechanical Engineering, Provost and Chair Professor of

Mechanical Engineering Prof Wei Shyy gave the opening speech. Over 100 engineering students and faculty members attended.

Prof Xu focused on the opportunities and challenges raised by Northwest China's development. He analyzed the region's strategic position within the country's growth as a whole. The leading academic also discussed the demand for skills and technologies as the Northwest moved forward, looking at issues such as energy distribution in China, the region's economic and social development, and distribution of universities.

Prof Xu is a mathematician and an expert in signal and information processing. He is Director of the Institute for Information and System Sciences at XJTU and a Chief Scientist for the National Basic Research Program of China (973 Program). The HKUST Research Forum aims to foster synergy among faculty members and students within and across disciplines and to nurture a collaborative research atmosphere and culture. Forum events can also provide a good opportunity for students and faculty members to exchange ideas with global academic experts.

Calendar of Events

November 28, 2012

School of Engineering / Institute for Advanced Study Joint Lecture by Dr Andy Palmer
HKUST Campus

December 3, 2012

School of Engineering / Institute for Advanced Study Joint Lecture by Prof Barbara Ryder
HKUST Campus

December 11, 2012

SENG Distinguished Research Excellence Award Presentation Ceremony and Keynote by Prof Tongyi Zhang
HKUST Campus

The above events are subject to change without prior notice.

Don't be the Missing Link ...

Alumni relationships are invaluable assets to the School and alumni. To foster the growth of our alumni network, please keep us informed of your recent news and send us your updated contact information via email to seng@ust.hk.

Stay connected and keep in touch!

Editors: Diana Liu, Dorothy Yip
 Contributing Editor: Sally Course
 Address: School of Engineering
 The Hong Kong University of Science and Technology
 Clear Water Bay, Kowloon, Hong Kong
 Phone: (852) 2358-5917 Fax: (852) 2358-1458
 Email: seng@ust.hk Website: www.seng.ust.hk
 Facebook: www.facebook.com/SENG.HKUST

