

INFOCUS



HKUST ENGINEERING

Newsletter No.18 **Summer 2010**



Global Research Powerhouse

How the School of Engineering
is shaping the future

The world we live in today is moving ahead so fast that it can be a head-spinning task to keep up with all the changes. This is especially the case in the technology arena where models evolve every six months or so and new inventions across and within different fields are constantly being released.

As a research-intensive University, HKUST is certainly playing its role in driving forward such change through the significant discoveries of its world-class faculty and research students, and we are proud that the School of Engineering is playing a major part in this. Our continuing success in global rankings, the most recent being the No.7 position in the 2010 QS Asian Universities for IT and engineering league table, is one illustration of our achievements. HKUST was the only School in Hong Kong to be named in the top 10 in these fields.

In Focus 18 shows some of the many avenues that the School is exploring to develop applications and create solutions that can improve people's lives. As I discuss in the second part of my interview with this newsletter, we are also investigating new ways of carrying out research so that we can fully use our expertise to solve the large regional and global challenges that await in these opening decades of the 21st century.

The environment is one example where engineering researchers need to be prepared to integrate their skills with those from other disciplines to develop holistic approaches. We are encouraging and ready to adopt such interdisciplinary teamwork. For the large-scale problems we face cannot wait and as engineers used to tackling the seemingly unsolvable we can play a leading role in elucidating practical methods of resolving them.

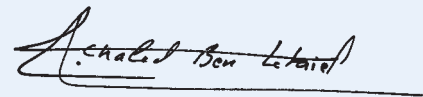
But strong research skills also have other roles to play. In teaching, those who are first-rate researchers can bring the latest information into their classrooms and inspire students to undertake inquiry-based methods of learning. Our new four-year undergraduate curriculum, being introduced in 2012, plays to those strengths as related by the School's new Associate Dean for Undergraduate Studies and Student Affairs.

Our aim in designing this student-centric

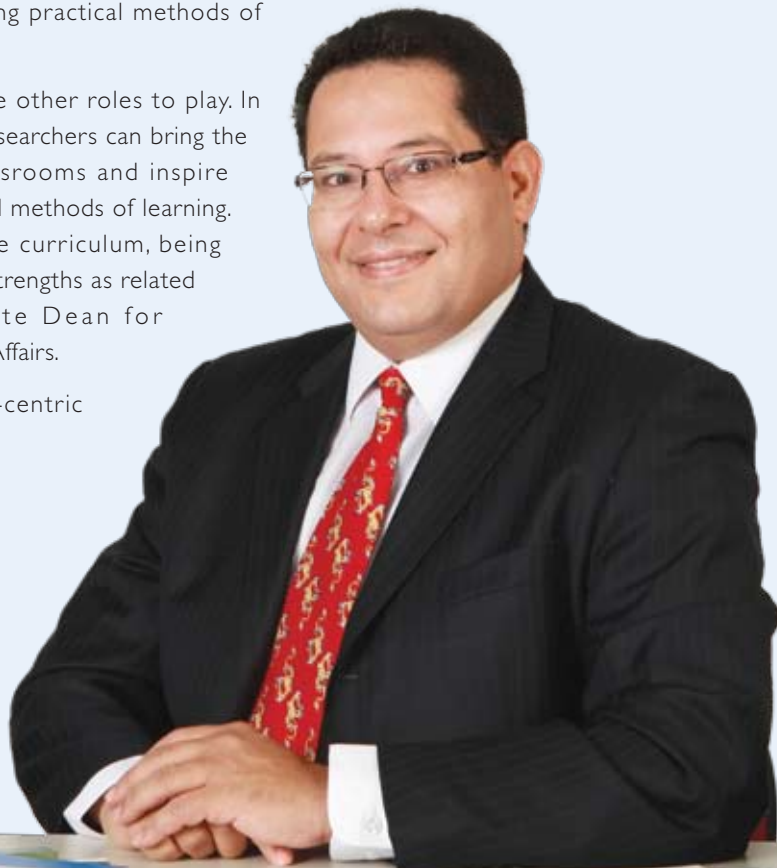
curriculum is to give our undergraduates the opportunity to discover the true excitement that a career in engineering can provide. To do this, we are intent on delivering a broader, more flexible program structure and an all-round educational experience, ranging from international exposure to service learning to research opportunities, allowing our students to grow into successful, thoughtful, multi-dimensional professionals.

Through our new curriculum, we seek to train the best engineers in Asia, helping students to develop into skilled communicators, analytical and inventive researchers, and adaptable problem-solvers capable of continuous learning and taking up a range of roles in different types of organizations or of running their own business.

So research is not the preserve of discoverers and inventors. It is a vital force for change both in practical terms and in the mindset of the next generation. At the School of Engineering, we are determined to make the most of our leading position to play a local, national, regional and global role in creating a brighter future.



Prof Khaled Ben Letaief
Dean of Engineering



Faculty Members

- **Prof Jack Cheng**
 Assistant Professor, Civil and Environmental Engineering
 PhD – Stanford University
- **Prof Zhiyong Fan**
 Assistant Professor, Electronic and Computer Engineering
 PhD – University of California, Irvine
- **Prof Gustaaf Kikkert**
 Assistant Professor, Civil and Environmental Engineering
 PhD – University of Canterbury
- **Prof Juipin Wang**
 Assistant Professor, Civil and Environmental Engineering
 PhD – Columbia University
- **Prof Levent Yobas**
 Assistant Professor, Electronic and Computer Engineering
 PhD – Case Western Reserve University

Adjunct Faculty

- **Prof Vincent Li**
 Assistant Professor, Mechanical Engineering
 PhD – University of Plymouth
- **Prof Wenquan Tao**
 Professor, Mechanical Engineering
 Graduate Study – Xi'an Jiaotong University

Visiting Faculty

- **Prof David Du**
 Professor, Computer Science and Engineering
 PhD – University of Washington
- **Prof Carol Sze Ki Lin**
 Assistant Professor, Chemical and Biomolecular Engineering
 PhD – The University of Manchester
- **Prof John Porter**
 Associate Professor, Chemical and Biomolecular Engineering
 PhD – University of Bath
- **Prof Patrick Yue**
 Associate Professor, Electronic and Computer Engineering
 PhD – Stanford University
- **Prof Jun Zhang**
 Assistant Professor, Electronic and Computer Engineering
 PhD – The University of Texas, Austin

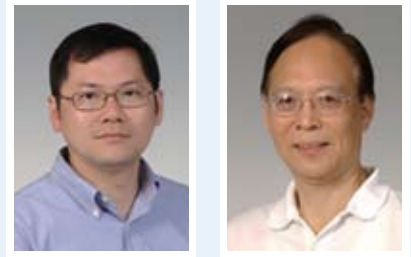
Administrative

- **Prof Roger Cheng**
 Appointed Associate Dean of Engineering
 for Undergraduate Studies and Student
 Affairs



National Honors for SENG Professors

Two School of Engineering (SENG) professors had their pioneering research work recognized nationally when they received 2009 State Natural Science Awards, second class, for their outstanding achievements.



The highly competitive awards are China's most prestigious honor in the field of natural science, celebrating academic excellence in basic and applied research.

Prof Xiren Cao, Electronic and Computer Engineering, gained the accolade for his project on "Optimization Theory and Methodology for Discrete Event Dynamic Systems" in information technology. Such systems include communication networks (for example, the internet), computer systems, logistics systems, manufacturing plants, transportation systems, robotics, and other man-made operational systems.

There is no unified theory in this area due to difficulties related to randomness, discrete states and nonlinearity. Prof Cao's team solved a number of long-standing issues and developed a framework for several different subjects and approaches, significantly advancing the development of fundamental theory and methodologies in the field.

Prof Chak K Chan, Chemical and Biomolecular Engineering and Division of Environment, received his award for the project "The Characteristics of Emission and Complex Pollution of Atmospheric Particulate Matter and Its Precursors". The study, a collaborative effort between Prof Chan and Prof Kebin He, Prof Jiming Hao and colleagues from Tsinghua University, explored the formation of atmospheric particulate pollution and its properties.

Prof Chan specializes in phase transformation and water uptake properties of atmospheric particles using the single particle levitation technique. His work has made great contributions to understanding the role of hygroscopic growth of particles and their effects on visibility degradation as well as cloud droplet formation, which is a critical issue in predicting climate change.

In 2009, only one first-class State Natural Science Award and 27 second-class awards were presented from more than 120 entries.



Geotechnical Expertise That Leads the Way

The quality of work carried out at the School of Engineering has been highlighted by HKUST's continued strength in global rankings, with the Geotechnical Group maintaining its No.1 ranking for the total number of journal papers published in four prestigious geotechnical journals for a decade (2001-2010), according to online academic database service Web of Science.

This tremendous achievement is the result of a collective effort by its six Civil and Environmental Engineering group members: Profs Charles WW Ng, Gang Wang, Jui-Pin Wang, Yu-Hsing Wang, Limin Zhang and Jidong Zhao. The leading journals are *Géotechnique*, *Journal of Geotechnical and Geoenvironmental Engineering*, *Canadian Geotechnical Journal* and *Soils and Foundations*.

Geotechnical Group goals include exploring the fundamental saturated and unsaturated behavior of geomaterials and addressing challenges in sustainable infrastructural developments and natural hazards prevention.

In addition, Geotechnical Group member and Associate Dean Prof Charles WW Ng has recently been appointed Chair Professor of Geotechnical Engineering by the Ministry of Education under the Chang Jiang Scholar Program. The appointment runs from 2010-13. The program is an elite

scheme co-founded by the Ministry of Education and Hong Kong's Li Ka-shing Foundation. To date, only around 1,500 Chang Jiang Scholars have been appointed across all fields since 1998. They come from top academic and scientific institutions worldwide.

The project "Green Slope Engineering for Hong Kong", with Prof Ng as principal investigator, was also granted HK\$5.8 million from the Research Grants Council in Hong Kong. The research, conducted with academics from The University of Hong Kong and The Chinese University of Hong Kong, aims to investigate and improve fundamental understanding of root-soil-water interactions and to develop an innovative reliability-based preliminary design concept and guidelines for "integrated bioengineered live slope cover" in Hong Kong.



Clipping the Web Down to Size

Wclipper, a useful technology which can bring complex web pages onto mobile phones, has been developed by School of Engineering researchers and is due to be commissioned by a major mobile phone service operator in Hong Kong for their subscribers later this year.

The technology, produced by the Web Research group led by Prof Vincent Shen, Computer Science and Engineering (CSE), offers a convenient and straightforward way to browse web pages even on small-screen mobile phones. CSE graduates Benfeng Chen, Shan Chen, Michelle Hong and Cammie Zhuang actively participated in the research and development of Wclipper.

The team has formed WebNova Limited to bring the new mobile browsing technology to the mass market. The company, established in 2006, currently operates from HKUST's Entrepreneurship Center.



Wclipper is already available to HKUST faculty, staff and students who can use the free service for six months from May, independent of the mobile services they now subscribe to.

HKUST Ranked No.7 for IT and Engineering in Asia

The School of Engineering (SENG) raised its regional profile further in May with the release of the Quacquarelli Symonds (QS) Asian University Rankings, which saw HKUST secure 7th place among Asian universities in IT and engineering. Similar to 2009, when the rankings were first established, the University was the only Hong Kong institution to be included in the top 10 in these fields.

Criteria for the rankings are tailored to universities in the Asian region, drawing on indicators including academic peer review, papers per faculty, citations per paper, student:faculty ratio, employer review, international faculty, international students, and inbound and outbound exchange students.

Globally, HKUST attained the No.26 position in the world's top 50 universities for IT and engineering in the *Times Higher Education* Quacquarelli Symonds (THE-QS) World University Rankings in 2009.

PhD Fellowship Candidates Flock to SENG

The School of Engineering has attracted the largest number of PhD students among local engineering schools in the recently launched Hong Kong PhD Fellowship Scheme, according to results released by the Research Grants Council (RGC) in May.

Demonstrating the global standing of HKUST, 33 candidates out of a total of 108 elite international candidates have accepted offers to study at the University, the highest among the seven UGC-funded institutions participating in the scheme. Twenty-two of those candidates will come to study in the School of Engineering.

The success of the School of Engineering is attributed to the dedication and outstanding research performance of its world-class faculty. "I am delighted to see that the School has been able to draw so many top young minds to Hong Kong," said Prof Jang-Kyo Kim, Associate Dean for Research and Graduate Studies. "The presence of Fellowship awardees will help to foster global vision and ties, and should further strengthen our already considerable research achievements in different engineering fields."

The Hong Kong PhD Fellowship Scheme was established by the RGC in 2009 to attract outstanding doctoral applicants from around the world to Hong Kong. Criteria for awards included academic excellence, research ability and potential, communication and interpersonal skills, and leadership abilities.

Two selection panels comprising 21 overseas and 15 local academics covering different fields helped to vet applications. There was also a detailed examination of short-listed applicants by a 16-member overseas panel in Hong Kong. The scheme was aimed at candidates eligible for admission to top global universities and only 148 offers were made despite almost 3,000 applications from 100 countries/regions.

Fellowship recipients will receive a monthly stipend of HK\$20,000 and a conference and research-related travel allowance of HK\$10,000 per year for a period of three years.



QS Asian University Rankings in IT & Engineering 2010

| Institution | Asian Ranking |
|---|---------------|
| The University of Tokyo | 1 |
| Tsinghua University | 2 |
| National University of Singapore | 3 |
| The Hong Kong University of Science and Technology | 7 |
| Nanyang Technological University | 8 |
| Peking University | 9 |

Hong Kong PhD Fellowship Scheme 2010/11

| Institution | Number of Awardees | Percentage |
|---|--------------------|---------------|
| City University of Hong Kong | 5 | 4.6% |
| Hong Kong Baptist University | 3 | 2.8% |
| Lingnan University | 1 | 0.9% |
| The Chinese University of Hong Kong | 29 | 26.9% |
| The Hong Kong Polytechnic University | 14 | 13.0% |
| The Hong Kong University of Science and Technology | 33 | 30.6% |
| The University of Hong Kong | 23 | 21.3% |
| Total: | 108 | 100.0% |

Source: Research Grants Council, as of May 27, 2010

Faculty Honors, Awards and Achievements



- Prof Guohua Chen, Chemical and Biomolecular Engineering, was elected a Fellow of the Hong Kong Institution of Engineers in January.



- Prof Sunghun Kim, Computer Engineering Program, has been selected for the highly competitive Software Engineering Innovation Foundation Award 2010, offered by Microsoft Research. Prof Kim's proposal, "Detecting and Fixing Bugs as They Are Created in Visual Studio" was one of only two selected from Asia and 12 worldwide out of 85 study proposals.



- Prof Ricky Lee, Mechanical Engineering, has been elected to the Board of Governors of the IEEE Components, Packaging and Manufacturing Technology (CPMT) Society for 2010-11. CPMT is the premier professional society for advancement of the field. There are only three members from Asia among the 18 board members.



- The paper "Debonding Along the FRP-Concrete Interface Under Combined Pulling/Peeling Effects", by Prof Christopher Leung, Civil and Environmental Engineering, and Dr Jinlong Pan, a former doctoral student, has been named one of the top 25 most-cited papers published in *Engineering Fracture Mechanics* from 2005-09. The journal published a total of 1,122 papers over the period.



- Prof Bo Li, Computer Science and Engineering, was awarded the 2009 Cheung Kong Scholars Award in computer science. The Cheung Kong Scholars Program was jointly established by China's Ministry of Education and the Li Ka Shing Foundation in 1998 to further improve China's standard of education and intellectual competitiveness. Prof Li together with current and former PhD students SS Xie, GY Keung, JC Liu, I Stoica, H Zhang and XY Zhang also received the Best Paper Award from the IEEE Communications Society, Technical Committee on Multimedia Communications for 2009 for "An Empirical Study of the Coolstreaming+ System". This was published in the *IEEE Journal on Selected Areas in Communications*, Special Issue on Advances in Peer-to-Peer Streaming System, in December 2007.



- Prof Yunhao Liu, Computer Science and Engineering, together with visiting PhD student Dezun Dong, and PhD student Mo Li received the Best Paper Award at the IEEE International Conference on Parallel and Distributed Systems (ICPADS'09) in December 2009 for their research project "WormCircle: Topological Detection on Wormholes in Wireless Sensor Networks". The paper was also co-authored by Prof Xiangke Liao, National University of Defense Technology, Changsha, China. The conference saw 305 papers submitted and 87 accepted for presentation at the conference.





- Prof Long Quan, Computer Science and Engineering, has been made an IEEE Fellow for contributions to three-dimensional computer vision. He was also recently named one of the Best Ten Lecturers in annual awards presented by VERTEX, House II Students Association, at HKUST.



- The 2009-10 Li Foundation Heritage Prize for Excellence in Creativity has been awarded to Prof Gang Wang, Civil and Environmental Engineering. The prize is the Li Foundation's top award for Chinese scholars in all areas of science and medicine, the arts and humanitarian fields. Prof Wang, the only recipient of the prize for 2009-10, was cited for his "outstanding and distinguished research contributions in the field of earthquake engineering and geo-hazard mitigation". The Li Foundation was founded in 1944 by Dr Kuo Ching Li and is based in New York.



- Prof Raymond Wong, Computer Engineering Program, has received the ACM Conference on Information and Knowledge Management (CIKM) 2009 Outstanding Service Award in appreciation of his outstanding leadership and dedicated service as Poster Chair at CIKM 2009. The 18th conference was held in November in Hong Kong.



- Prof Qian Zhang, Computer Science and Engineering, has been made a ComSoc Distinguished Lecturer for 2010-11 by the IEEE Communications Society. The committee based their decisions on strength of the references in the nominations, oratorical reputation of candidates, and the subject matter of candidates' expertise. Prof Zhang was one of the only five Distinguished Lecturers selected worldwide in this round.



- Prof Tianshou Zhao, Mechanical Engineering, has been appointed an editor for the new Energy and Environment Series of books by the Royal Society of Chemistry. The other three editors are Prof Laurence Peter, University of Bath, UK, Prof Heinz Frei, Lawrence Berkeley National Laboratory, US, and Prof Dr Ferdi Schüth, Max-Planck-Institut für Kohlenforschung, Germany. The series will feature professional monographs covering specific energy areas such as solar energy conversion and solar cells; solar fuels and artificial photosynthesis; fuel cells; hydrogen storage; materials for energy conversion systems; carbon capture and storage; chemicals from CO₂; catalysis in the context of energy conversion and energy saving; and atmospheric chemistry and global climate change.



IELM Professor Awarded Top Accolades

Prof Fugee Tsung, Head of Industrial Engineering and Logistics Management, has been in the spotlight recently, gaining a series of prestigious awards that recognize his significant contributions to the field.

In 2010, Prof Tsung was made an Institute of Industrial Engineers (IIE) Fellow, becoming one of only five in Greater China (Mainland China, Hong Kong and Taiwan) to hold this honor. IIE is the world's largest professional society dedicated solely to the support of the industrial engineering profession. The award is the organization's highest accolade.

A leading international researcher, Prof Tsung also secured the 2009 Best Paper Award in flagship journal *IIE Transactions*, the second time he has won such recognition. "Statistical Monitoring of Multi-stage Processes Based on Engineering Models", co-authored with Liming Xiang, used engineering models based on physical and mechanical laws to show how quality variations are transmitted from one stage to the next. Prof Tsung collected the Outstanding IIE Publication Award, which acknowledges outstanding research published in any IIE journals or medium, for the same paper.

In November, Prof Tsung was elected a Fellow of the American Society for Quality (ASQ), the organization's top honor. ASQ has over 100,000 members globally. There are only four ASQ Fellows in Greater China.

Prof Tsung received both his master's and doctoral degrees in industrial and operations engineering from the University of Michigan and his bachelor degree in mechanical engineering from National Taiwan University. He joined HKUST in 1997.

Air Pollution Research to Build Clearer Picture for Solutions

Prof Chak K Chan, Chemical and Biomolecular Engineering and Division of Environment, will use his expertise in aerosol chemistry and air



pollution to lead a key research project that seeks to assist the development of solutions to Pearl River Delta pollution.

The study is one of two air pollution studies conducted by local universities and supported by the HKSAR government's Environment and Conservation Fund (ECF). Prof Chan's project will tackle real-time characterization of fine particles in the air to strengthen understanding of the nature and sources of such particles. It will utilize a suite of state-of-the-art instruments for air pollutant characterization, originally funded through the Special Equipment Grant from the University Grants Committee awarded to Prof Alexis Lau, Civil and Environmental Engineering and Division of Environment. The second study on photochemical air pollution will be led by Prof Wang Tao, The Hong Kong Polytechnic University.

Combined with monitoring data from the Environmental Protection Department, the two studies' findings are expected to contribute to the formulation of a control strategy to tackle the particulate and photochemical smog problems that are the main air pollution issues in the Pearl River Delta. The ECF has approved HK\$13 million in total for the two projects, which are expected to last around four years.

Top Regional Post for Display Technologies Leader

Dr William MW Mong Chair Professor Hoi Sing Kwok, Electronic and Computer Engineering, has been elected Vice President – Asia for the Society for Information Display, the only global organization dedicated to the advancement of electronic-display technology.

An expert in display technologies and nanotechnologies, Prof Kwok received his bachelor degree in electrical engineering from Northwestern University and earned both his master's and PhD degrees in applied physics from Harvard University. He joined HKUST in 1992 and is now Director of the Center for Display Research.





Moving Ahead of the Times

Prof Roger SK Cheng discusses his new post as Associate Dean, Undergraduate Studies and Student Affairs, and the goals he is setting out to achieve.

Prepare for a whole new way of becoming an engineer with the enterprising undergraduate curriculum now being developed at the School of Engineering and due to be introduced in 2012 as part of Hong Kong's wide-reaching education reforms that will see local universities move from a three-year degree system to four years.

Getting all the features of the new curriculum ready and in place is a major task which has led Dean Khaled Ben Letaief to create an additional Associate Dean position that focuses on the many organizational issues to be handled. The man with the plans in the new post is Prof Roger SK Cheng, Electronic and Computer Engineering, who has been with HKUST since 1995. "The engineers we need to produce today are quite different from those of 20 years ago," he said. "This is partly due to advances in technology but also because of changes in Hong Kong. In the future, they will not be pure engineers. They need to have more transferable competencies to be able to adapt more."

The result is an exciting, flexible, four-year curriculum designed to motivate students about their engineering studies while at the same time enable them to explore additional avenues such as minor programs and second majors, and enjoy whole-person development.

"The key is not to keep increasing knowledge of the facts. Engineering has been developing for so many years there is no way you can go in-depth in all areas, even within one discipline," Prof Cheng said. "The idea is to go in-depth in one area and at the same time acquire the skills to go deeply into other areas independently. Once you have that ability, you can continue learning after graduation. With engineering changing so fast, students need to acquire this skill."

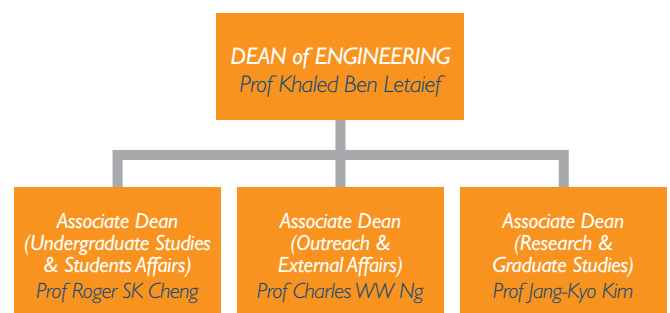
All students will enter the School, not a specific field of engineering, under the four-year program. They will have about a year's time to explore, interact with faculty and receive proper advice and counseling before they decide on their major. "The whole approach is more student-centric. After they join their major, they will take interesting introductory courses so they know why they are learning, what they are learning, and how it will be used." Such courses may also set aside traditional lecture-based structures to focus on

hands-on, lab-based approaches that get students really involved in their subject.

Other new elements are greater emphasis on presentation and technical communication skills and more time for students to explore their areas of interest. Students keen on research, for example, will be able to carry this out over a semester instead of squeezing it into the holidays as now. Those who want to be practicing engineers may spend more time in internships while budding entrepreneurs can take a business minor. Service learning and exchanges will also be available.

The School has done a great deal of benchmarking with universities worldwide, especially in the US, to learn from others' experience and go beyond it to develop what Prof Cheng describes as a "really good curriculum" suitable for Hong Kong and the region. It has been in close contact with The Hong Kong Institution of Engineers, the local professional body that accredits the School's programs and offers global accreditation for the School's graduates under the Washington Accord, and received positive feedback after a skeleton of the new curriculum was presented.

"Our focus is to provide a truly good education and experience for those who get into our program," Prof Cheng said. "We want students interested in engineering to see HKUST as their first choice."



Innovative Powerhouse that Seeks to Drive the Future

School of Engineering Dean Prof Khaled Ben Letaief discusses the School's world-class research and its regional and global vision in the final part of his interview with In Focus

What kind of research do you see SENG embracing in the future?

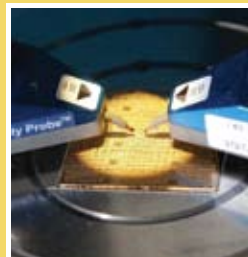
We would like the engineering school to deal with challenges facing humanity and find solutions to big problems. Many of these challenges, such as environmental issues, are now multidisciplinary, taking in science, politics and economics, and different fields of engineering. So we are seeking to come up with strategies and initiatives to look at theme-based research. Instead of faculty having their own research centers and labs where they deal with important topics within their own field, we would like to pull people together, to involve multiple researchers and multiple groups. In this way, we hope to take the school to a new level of excellence, not only making a significant impact in Hong Kong but on a global scale.

How does SENG's world-class research benefit the School's students?

Some people feel that you can be great at research or teaching but not both. We believe they go hand in hand. In fact, it is one of the best advantages of a research-intensive university such as HKUST. This is especially so in engineering where technology is moving so fast that whatever was learned 20 years ago has now changed. If you are not an up-to-date researcher, you are not going to be giving your students what they need. I like to lead by example and show that high standards in both are do-able.

Can undergraduates participate in such research?

We would like to take advantage of our excellence in research to link students to research groups to help instil the ideas that drive investigation and inquiry-based teaching. We don't want students to go into classrooms and expect to be given a recipe. We want them to ask questions and inquire, two capabilities that are the basis for life-long learning. This is what 21st century engineers will need.





In what ways will the School work with other institutions?

We recognize that the problems that we can assist in solving have become so big that they require a range of expertise. As we will seek to work with people from different fields, it goes without saying that we will also look to work with other institutions in Hong Kong, in Mainland China and overseas. It is one of our goals to strengthen these links.

What role will the School play in relation to development in the Pearl River Delta?

Engineering is very important in the Pearl River Delta and the Pearl River Delta is important to China. There are many major hi-tech companies, particularly in Shenzhen. Yet when you look around the Guangzhou area there are very few engineering faculty. This means there is a huge demand for knowledge, especially as companies in the Pearl River Delta must now go up to the next level where innovation rather than price is the key to success. For that to happen you need research and universities to act as driving forces. Just as in Silicon Valley where Stanford and Berkeley are nearby, HKUST therefore has the opportunity of a lifetime here. Many companies in the Pearl River Delta are global companies. We are next door. It is a golden chance to push forward to the next level of technology.

How will this be achieved?

We have our Nansha campus with its teaching and research centers. We have activities in Shenzhen where we work with companies. Strategic alliances with institutions across the border will also be important for joint degrees, joint centers, in working together to bid for major national projects, and to produce engineers and more innovations. It is a win-win situation. We are a top-ranked institution with world-class faculty and can be one of the universities that makes a difference in terms of producing the human capacity and innovation for this part of the world to become a global force.

Will you be able to keep on attracting top academics to the School to drive such change?

Faculty members want to come because of the huge opportunities across the border. In other parts of the world, faculties are getting smaller due to budget cuts, which is not the case over here. The environment at HKUST is another key factor. HKUST is a diverse place where what matters is merit and excellence. There is also an academic freedom that you can't find in many other places in Asia, even Singapore. I think that's a big plus.

Would you like the School to be a model for other universities in the region?

We hope to be a model for the world.



Mainland Undergraduates Prepare for High-Flying Future

MIT? Yale? Purdue? Stanford? A group of final-year Mainland undergraduates from different departments in the School of Engineering are hard at work trying to decide their next move.



Yang Yang (Industrial Engineering and Logistics Management), Hongkai Dai (Electronic and Computer Engineering) and Yangyang Liu (Electronic and Computer Engineering) hold several PhD offers from prestigious US universities while Peng Yu (Mechanical Engineering) has several to study an MSc. All have chosen to undertake further study to build up their career potential in the academic and/or business arena. Explaining why, Yang said: "I am passionate about research. Pursuing a PhD can help me to create something new through my studies. After I finish, I will be able to make a greater contribution to society."

Yang and Liu both aspire to careers as academics after gaining their PhDs and Liu is already clear about the direction she would like to pursue in her research: optics, photonics and opto-electronics. She chose to pursue her PhD in the US because she believes the country has great resources and opportunities. "There are many academic exchange and cooperation opportunities. It is a great place to study engineering," she said.

While the four agree that the US is an exciting location to study the latest engineering technology, all have also thought of returning to China for work. "I hope to be an aircraft engineer after graduation," said Yu, who would like to be part of the team that builds a Boeing 737-size plane in China. "The country is enjoying very fast development and needs support from industry in order to keep the economy growing."

The students fully acknowledge the role that HKUST's top faculty members and environment have played in inspiring them to want to study more and in opening up opportunities for studying overseas. Dai, for example, was motivated to take up research in robotics after participating in the annual Robocon competition launched by the Asia Pacific Broadcasting Union, which challenges undergraduate student teams to build robots that can complete certain tasks. "I love HKUST's global insight. It has been a stepping stone for me to go international. During my postgraduate studies in the US, I hope to develop a robot that can function as naturally as humans," Dai said.



Another beneficiary of RoboCon is Xiaoyu Li (Electronic and Computer Engineering), who has chosen to move outside academia and will take up a post at Goldman Sachs. The leader of a Robocon team in 2008, he said the contest had prepared him well for the

teamwork and cooperation required in a global company, enabling him to get a summer intern analyst job and then an offer to return full-time to the top investment bank. "The leadership experience was also helpful to me when I was working." To gain more financial knowledge, Li deliberately took a finance course in his last semester and advised fellow students that preparation and confidence are important in an interview and at work.

Whether heading into research or going into the workforce directly, all the Mainland students said that they were happy with their choice to study at HKUST and had enjoyed the learning experience it provided, with its world-class faculty, great global network, young and dynamic approach, and research and exchange program opportunities. "No regrets!"

was the chorus of approval regarding their decision to take undergraduate studies at the School of Engineering.



Student Honors, Awards and Achievements

- MPhil student King Shan Cheung, Electronic and Computer Engineering, was awarded the third prize in the IEEE Hong Kong Section 2009 UG Student Paper Contest for his 2008-09 final-year undergraduate research "Stereo Computer Vision with Multiple Cameras". The proposed algorithm aims to evaluate the 3D coordinates of an arbitrary number of fingertips without providing any training sequences in fingertip recognition. The paper was also selected to join the IEEE Region 10 Student Paper Contest.



- Mechanical Engineering students Ka Hei Chow, Man Yiu Hoi, Kwong Pui Lei, and Tsz Wai Mak received the second prize in the 1st International Contest of Applications in Nano/Micro Technologies (iCAN 2009), held in Xiamen in January. The 2009-10 final-year project students received the award for their "Wireless Landslide Alert System for Slopes in Hong Kong Using MEMS Motion Sensors", carried out in collaboration with geomechanics expert Prof Yu-Hsing Wang, Civil and Environmental Engineering. Several companies showed strong interest in the project.



- Industrial Engineering and Logistics Management (IELM) undergraduate students successfully defended the department's crown at the Chartered Institute of Logistics and Transport in Hong Kong Student Day case competition in March, enabling an IELM team to become champions for the second consecutive year. The team, comprising Year 3 students Ye Gong, Long He, Miu Yin Ma (dual degree), Yang Yang and Alex Shaw Liang Yap, outperformed representatives from eight other tertiary institutions.



- Yangyang Liu (Year 3), Electronic and Computer Engineering, received the Best Presentation Award at the 10th IEEE Photonics Society Hong Kong Chapter Postgraduate Conference 2009 in November for her paper "Optothermal Coherent Manipulation of Microparticles". Liu's work was selected from 22 postgraduate research papers submitted by five participating local institutions: HKUST, The Chinese University of Hong Kong, The University of Hong Kong, City University and Polytechnic University.



- Jiahui Shi (Year 3), Computer Engineering Program, was awarded the second prize in the IEEE Hong Kong Section 2009 UG Student Paper Contest for her paper "Real-time Ego-motion Measurement with Stereo Camera & IMU". Applications also include augmented reality and 3D reconstruction.



- SENG graduates Mingyu Wang, Electronic and Computer Engineering, and Shucheng Zhu, Computer Engineering Program, received the second class award in the 11th Challenge Cup Competition of Science Achievement for their project "GPS Robotic Water Analyzer". The competition is recognized as the "Chinese Olympics of Science and Technology" among Chinese college students, covering the fields of management, social science, energy sources, science and technology. Wang is now studying an MPhil in the Department of Electronic and Computer Engineering at HKUST while Zhu is undertaking a PhD in the Department of Electronic Engineering at Princeton University.



- In December, doctoral student Xi Yang, Industrial Engineering and Logistics Management, received the first prize in the Best Student Paper Competition at the first Production and Operations Management (POM) conference organized in Hong Kong.



- PhD candidate Chenchang Zhan, Electronic and Computer Engineering, was honored with the Best Paper Award at the IEEE International Symposium on Integrated Circuits 2009 for his paper "A Low Dropout Regulator for SoC with High Power Supply Rejection and Low Quiescent Current", co-authored with Prof Wing Hung Ki. The regulator employs adaptive biasing to extend the loop bandwidth at heavy loads and is energy efficient even at light loads. The paper was selected from more than 160 presentations.

- PhD student Jie Zhang, Industrial Engineering and Logistics Management, was awarded the second prize in the Best Student Paper Competition at the first Production and Operations Management (POM) conference in Hong Kong.



Mixing with Corporate Leaders at Global CEO Forum

Six Dual Degree Program in Technology and Management (T&M) students gained first-hand experience of life at the top of the international corporate world when they attended the prestigious 2009 BusinessWeek CEO Forum in Beijing in November.

“Unforgettable”, “an extraordinary learning experience” and “inspiring” were some of the comments from T&M participants after the 2009 event, which focused on China and the post-recession global economy. Keynote speakers were Mr Jon Huntsman, US Ambassador to China, and Nobel Laureate in Economic Sciences Prof Robert Mundell, Columbia University.

The T&M students attending the international gathering of corporate leaders were Lambert Tsun Him Lam (Year 4), Tony Tsz Yeung Cheng (Year 4), Carol Ka Yan Tai (Year 4), Felix Hok Kan Lau (Year 2), Shanshan Wang (Year 2) and Yuemin Lu (Year 2). The dual degree is a four-year undergraduate program.

More than 300 senior business leaders from around the world were attracted to the forum.



Teaching and Learning

Minor Program

Offers Insight into the Law

As part of the School of Engineering's plans to enhance the breadth and depth of its undergraduate curriculum, an enterprising new minor program in engineering management and law will be launched in Fall 2010. Lawyers with experience of engineering practices are due to be recruited to assist with teaching.

“This minor will significantly broaden students' knowledge and skills in a way they should find highly useful as they start their engineering careers in Hong Kong or other parts of the world,” said Prof Khaled Ben Letaief, Dean of the School of Engineering.

Four core courses and 12 electives will be offered. Core courses cover the legal perspective on engineering practices and operations, intellectual property law in engineering, project investment strategies and cost control, and engineering management. Electives will enable students to explore more specific aspects of the law in relation to engineering management.

Battle of the Tiny Devices

An international micro-electro-mechanical tug-of-war contest involving postgraduates from HKUST and counterparts at Kyoto University in Japan has been held as part of the Department of Electronic and Computer Engineering's microsystems course ELEC 501.

The innovative course has been jointly developed by Prof Man Wong of HKUST and Prof Osamu Tabata of Kyoto University, with students grouped into project teams consisting of one HKUST and one Kyoto University student. The course is regularly offered in the Fall semester.

This year's design project called for the implementation of micro-electro-mechanical devices that engaged in tugs-of-war. Each device was no larger than 0.3 by 0.3 mm² and fabricated utilizing the same technology used to make integrated circuits. In comparison, the diameter of a human hair averages about 0.1mm.

A video of the unique contest is available at www.youtube.com/watch?v=u0qLE-mIXrQ.



Honorary Fellowship Conferred on First PhD Graduate

Prof Jack Lau, the University's first PhD graduate, added another accolade to his long list of achievements in June when HKUST conferred an Honorary Fellowship on the enterprising academic and entrepreneur in recognition of his significant achievements in relation to the University and Hong Kong.

After completing his PhD on integrated magnetic sensors in bulk silicon and SOI technologies in 1994, Prof Lau joined HKUST as an Assistant Professor in the Department of Electronic and Computer Engineering. In 1999, he established Perception Digital with fellow Electronic and Computer Engineering professors CY Tsui and Roger Cheng under the HKUST Entrepreneurship Program. The hi-tech solutions company has since grown into a significant enterprise with over 240 staff in Hong Kong and on the Mainland. It is also the largest company in terms of number of employees and revenue to have participated in the HKUST Entrepreneurship Program. In February, Prof Lau presented HKUST President Prof Tony Chan with a serial number 001 souvenir share certificate to celebrate the enterprise's December 2009 launch on the Growth Enterprise Market in Hong Kong.

In 2009, Prof Lau also fulfilled his dream of giving back to the education sector with the launch of the Dr Jack Lau School of Engineering Scholarship for Mainland Students at HKUST. The first recipient, Yongduo Wang, Electronic and Computer Engineering, was selected in July 2009. A second award, the Dr Jack Lau Recruitment Scholarship for Outstanding Mainland Student, will start from 2010-11 to encourage a top Mainland entrant in either the School of Engineering or the School of Science at HKUST.

Prof Lau, currently Adjunct Professor in the Department of Electronic and Computer Engineering, was one of three Fellowship awardees honored by HKUST this year.



Brothers Create Facebook Application Success Story

In 2008, brothers and School of Engineering alumni Terry Tsang (MPhil Civil Engineering, 2006) and Terence Tsang (BEng Computer Science and Engineering, 2006) felt they were ready to follow their dream. So they bravely gave up their stable jobs in banking and IT, launched Pencake Limited, and established themselves as Facebook application developers.



The company, which specializes in helping brands and agencies create and launch interactive promotions on Facebook, has proved a hit, attracting major clients such as the MTR and Microsoft Hong Kong and becoming a key player in the South East Asian market. Pencake now has 26 million monthly active users from around 200 countries, 90 million page views each month, and has launched 12,000 applications.

Terence focuses on writing programs while Terry is responsible for sales and marketing. Among their most popular apps are Element Analyst and 5 Friends Analyst, with unique user numbers totaling seven million and still growing.

Despite Pencake's success, the brothers had to cope with the initial difficulties involved in starting a new enterprise, including no income for 18 months. A key breakthrough came after 1½ years of struggle when they took part in the Hong Kong ICT Awards. Entering the contest with their fun Facebook application Hong Kong Polling Station, which allows people to vote on hot topics in the city (for example, "Who is your favorite actor?"), they reached the final five. Since then, they have been increasingly recognized, with more and more companies asking them to help with Facebook marketing.

Pencake has also been selected as an MBA case study by both HKUST and The Chinese University of Hong Kong, commencing in 2011.

As members of the post-80s generation, Terry and Terence believe those with long-term vision and creativity can achieve their entrepreneurial dreams. "Given the courage to take the first step, everyone has a chance to succeed," Terry said.

MSc Telecom Group Formed

In an exciting move, an alumni association for HKUST MSc in Telecommunications graduates has been established to provide a platform for dynamic exchange about the information, communications and technology industry, continuous learning and career development.

The first executive committee of the HKUST MSc in Telecommunications Alumni Association (MTelAA) was formed in March 2010 and the group's first event cum inauguration ceremony held in May. Guest of honor Dr Samson Tam Wai Ho, Legislative Council member for information technology, gave a keynote speech on "Future Society, Future Talents".

Dr Tam's speech focused on the impact of information and communication technologies on social structures. Dr Tam also gave tips on how alumni should equip themselves to deal with macro trends as well as sharing his entrepreneurial experience, which has seen him move from engineer to chairman of a listed technology company.



RFID on Display at World Expo

Alumnus Craig Jo (BEng, Computer Engineering Program, 2004) has set his expertise in hi-tech radio frequency identification (RFID) technology to work at Expo 2010 Shanghai as part of the Hong Kong exhibit in the Urban Best Practices Area. Under the theme "Smart Card • Smart City • Smart Life", the Hong Kong display highlights the extensive use of smart card and RFID technologies in the city. Craig is Business Development Director of Hong Kong RFID Ltd, an award-winning RFID hardware manufacturer, distributor and consultancy firm in Hong Kong and southern China.

Fun night for Engineering Enterprise Management Alumni

MSc in Engineering Enterprise Management (EEM) graduates now have a convenient way of keeping in touch, following the launch of the Engineering Enterprise Management Alumni Association (EEMAA) in March. EEMAA's 1st Annual Dinner was successfully held in May, drawing alumni and faculty to the lively evening. Other events and activities planned include quality system seminars, company visits and a mentorship program.

The association has been established by EEM alumni with the assistance of the Department of Industrial Engineering and Logistics Management. The group aims to build solidarity and expand networks among its members, to promote engineering management expertise, and to cultivate a sense of belonging to the University. This year marks the 5th anniversary of the program, which is jointly offered by the School of Engineering and the School of Business and Management. For further information about the association, email eemaa@ust.hk or join its Facebook group "HKUST EEMAA".



ECE Alumni Catch Up with the Changes

A happy alumni get-together, organized by the Department of Electronic and Computer Engineering (ECE) on November 22, saw old friends catching up and sharing experiences, and receiving the latest updates on changes within the department. Many alumni also took the opportunity to give suggestions and feedback on future development.

The gathering kicked off at the HKUST Stadium where an entertaining alumni-faculty soccer match took place. Other alumni and their families played badminton and table tennis in the Sports Hall.

After this strenuous afternoon, alumni and faculty enjoyed a buffet dinner at the G/F Chinese Restaurant, featuring lots of good food, wine and socializing. Ms Pandora Yuen, Deputy Director of the Student Affairs Office, gave an interesting talk on past and present student life at HKUST, and ECE alumni representatives also shared their feelings about the department.



Honors and Achievements

- MPhil graduate Sidney Lam (Civil and Environmental Engineering, 2006) has been offered the post of lecturer in the Department of Civil and Environmental Engineering at the University of Manchester, UK, starting in September 2010.

- PhD graduate Dr Kelvin T W Ng (Civil and Environmental Engineering, 2008), currently Assistant Professor at the University of Regina, Canada, has been awarded the Grand Prize at the HKIE Innovation Awards for Young Members 2010.



- UG graduate Rui Wang (Civil and Environmental Engineering, 2009) has been awarded the HKIE Geotechnical Division Award – Best Student 2009-10.

- PhD graduate Patrick Wu (Electronic and Computer Engineering, 2009) has been awarded the IEEE Custom Integrated Circuits Conference 2009 Best Student Paper Award for his research on “An Area- and Power-efficient Monolithic Buck Converter with Fast Transient Response”, co-authored with Prof Philip KT Mok. The IEEE conference is the premier forum for IC development.

- MPhil graduate Chun Ying Yu (Civil and Environmental Engineering, 2007) has won the third prize in the “Trainee of the Year Awards”.

- The HKUST Civil and Environmental Engineering Postgraduates and Scholars Association (HKUST CEE PGSA) was successfully established in March. Prof Christopher Leung, Head of the Department, 12 faculty members, guest of honor Prof Jiayuan Wang, Vice-Dean of the College of Civil Engineering at Shenzhen University, chief originator Prof Paul Chang and over 65 alumni attended the event.



Venture Capitalist Explores Colorful Business Strategies



Price competition is giving way to innovation as businesses seek to survive in today's corporate environment, according to venture capitalist Dr Zhi Tan, who led a fascinating School of Engineering Distinguished Speaker Seminar recently.

The seminar, "Red Ocean to Blue Ocean: Transforming Today's Businesses", was held on March 25, attracting over 150 people including professors, undergraduate and postgraduate students. Dr Tan looked at how companies are leaving behind their "Red Ocean" strategy, which focuses on competitive pricing, and adopting a "Blue Ocean" strategy, where innovation plays a central role in their competitiveness.



One example, he said, was Framedia, a company that had evolved into a market leader in China's media industry by using ideas to set new rules that revolutionized an existing industry. Dr Tan is a former CEO and chairman of Framedia, which grew from RMB30 million in revenue to near RMB700 million under his leadership. The company was acquired by Focus Media in 2005 for US\$183 million. Dr Tan was CEO and director of Focus Media from 2007-09.

HKUST speakers also shared their views on engineers in today's business world. They included Prof Tony Chan, HKUST President; Prof Matthew Yuen, Acting Vice-President for Research and Development; Prof Vincent Shen, Computer Science and Engineering; Prof Pascale Fung, Electronic and Computer Engineering; Prof Jack Lau, Chairman of Perception Digital Holdings Ltd; and MPhil student Mingyu Wang, Electronic and Computer Engineering. A video of the event is available at <http://videochannel.ust.hk/Watch.aspx?Video=FBEDF628CFC18300>.

HKUST speakers also shared their views on engineers in today's business world. They included Prof Tony Chan, HKUST President; Prof Matthew Yuen, Acting Vice-President for Research and Development; Prof Vincent Shen, Computer Science and Engineering; Prof Pascale Fung, Electronic and Computer Engineering; Prof Jack Lau, Chairman of Perception Digital Holdings Ltd; and MPhil student Mingyu Wang, Electronic and Computer Engineering. A video of the event is available at <http://videochannel.ust.hk/Watch.aspx?Video=FBEDF628CFC18300>.



IT Career Talk Draws 150 Students



A career talk directed at IT students in the School of Engineering was organized on February 10 to provide additional insight into opportunities in the field. Around 150 Electronic and Computer Engineering (ECE), Computer Engineering Program (CEPG) and Computer Science and Engineering (CSE) students attended.

At the annual career session, alumni were invited to join a panel discussion to share their experiences with students. Panel members included Mr Alger Hoi, Asia Custom Solution Engineering Manager, Yahoo!; Mr Darwin Yim, Deputy General Manager, Fujitsu Microelectronics Asia Ltd; Miss Claudia Sin, Software Engineer, ecVision Solutions; and Miss Chan Fu Bong, Associate Director, Technology Division, UBS. Students were able to freely ask questions about their future careers and alumni gave advice. A video of the event is available at <http://videochannel.ust.hk/Watch.aspx?Video=39ADC4548703F216>.

Tripartite Internship Program Held



Eighteen second-year Civil and Environmental Engineering undergraduates attended a completion ceremony on March 22 for the first six-week tripartite training program, involving energy giant CLP Power, and construction companies AECOM and Hip Hing. The program took place between December 2009 and February 2010 and was the first in the construction industry to give engineering undergraduates the opportunity to gain on-the-job experience at different companies in a single session. The move was well received by professors, students, and partnering organizations.

Events Round-Up

- The 4th International Lean Six Sigma Conference cum 1st Healthcare Improvement Conference 2010, co-organized by the Department of Industrial Engineering and Logistics Management and the Six Sigma Institute, was held on March 20. The successful event attracted scholars from world-renowned institutions as well as professionals and executives from companies and organizations across the globe.
- The Department of Electronic and Computer Engineering arranged visits to social enterprises on November 5 and 6 for students joining the Hong Kong Social Enterprise Challenge. The business plan competition seeks to turn creative business ideas into sustainable commercial ventures that promote social good. The visits aimed to give students a deeper understanding of social enterprises and the society's needs.
- The ACM-HK Bioinformatics Symposium was held at HKUST on March 27. The meeting was organized by the Department of Computer Science and Engineering. Twelve submissions from students from different local universities were accepted for the symposium. About 40 participants attended the event.
- A career talk by Marvell Technology Group Ltd, a leading fabless semiconductor company, was organized by the Department of Electronic and Computer Engineering on March 5. Marvell representatives were invited to give IT students the latest information on their company development and career opportunities. Around 50 undergraduate and postgraduate students attended the talk.
- Earlier, on March 1, the Department of Electronic and Computer Engineering organized a Teaching Assistant and Research Postgraduate Student Gathering in the University Center Quiet Lounge. A lunch buffet, games, and lucky draw were provided. Around 80 students joined the get-together.
- The ECESS Festival 2009-10, arranged by the Electronic and Computer Engineering Students' Society, included a number of different events and programs. Among these was the Mentoring Program, where faculty members shared experiences with small groups of students informally over dinner, and the Annual Dinner, with faculty and students in attendance. Both these activities have helped to increase communication within the department.

Research Postgraduate Symposium Fosters Links



The 1st HKUST MEPG Symposium organized by the Mechanical Engineering Postgraduates' Society (MEPGS) took place in October. The event

provided a platform for mechanical engineering research graduates to exchange academic views in an informal way and gave new graduate students exposure to the different research topics being pursued in the department. Counterparts in other local universities were also invited to attend.

The enterprising symposium attracted about 50 professors and research postgraduate students from HKUST, The University of Hong Kong, The Chinese University of Hong Kong, and The Hong Kong Polytechnic University. All the papers presented at the keynote and invitational sessions were by invitation from the organizers. There were also good opportunities for discussion.

MEPGS, founded in 2008, seeks to encourage contact and exchange among mechanical engineering postgraduates and to foster interaction between faculty and students. More information is available at <http://ihome.ust.hk/~mepgs/>.

IIE Student Chapter Established

A HKUST student chapter of the Institute of Industrial Engineers (IIE) has been formed by the Industrial Engineering and Logistics Management (IELM) Postgraduate Society to provide the department's undergraduates and postgraduates with access to the benefits available to the 40,000 other members of IIE worldwide.



HKUST Chapter No. 738 is based in the IELM Department. The main local chapter is IIE (Hong Kong) Ltd and IIE headquarters is located in Atlanta, Georgia, US. HKUST chapter objectives include promotion of the industrial engineering profession through research, study and discussion, and promotion of membership of IIE.

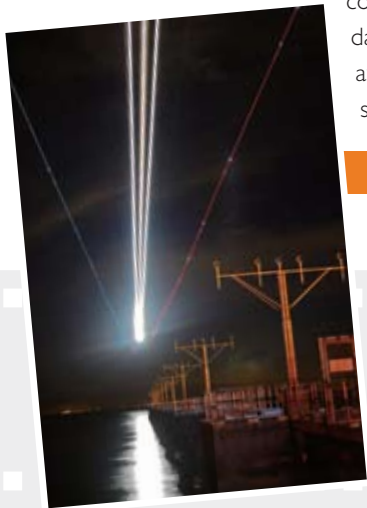


HOT SHOTS!

The first School of Engineering student photography contest, organized in May and June, drew an overwhelming response, with a total of 379 entrants and 775 photos submitted. "Engineered Life in Your Eyes" set out to raise young people's awareness about the connections between engineering and daily life. Two separate categories were available for tertiary students and secondary school students respectively,

All entries went into the initial round of judging, conducted via an online poll on Facebook, with the top award-winners decided by a judging panel comprising Ir Dr Andrew Chan Ka Ching, President of The Hong Kong Institution of Engineers; Mr Ng Sui Kou, Vice Chairman of Hong Kong Association of the Heads of Secondary Schools; and Mr Bobby Yip, former President of Hong Kong Press Photographers Association. Prizes included iPads and digital cameras.

Tertiary Institution Category



Champion

Navigator of Life* (生命的導航)
Lau Tak Lung
Community College of City University



First Runner-up

Blossoming Sunset* (夕陽無限好)
Mak Chun Kwong
The Hong Kong University of Science and Technology



Second Runner-up

Building Dreams and Constructing* (織夢·建)
Choi Chun Fai
Hong Kong Design Institute



Champion

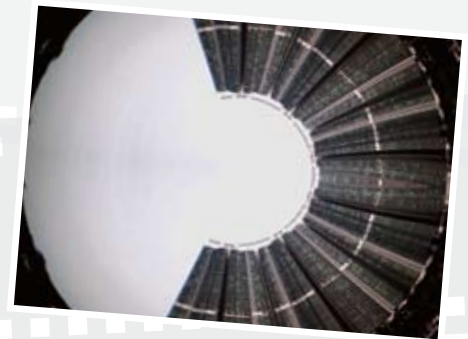
Air of Magnificence* (氣勢飛凡)
Cheung Chun Ho
S.K.H. Tsang Shiu Tim Secondary School



First Runner-up

Lighting and Home* (燈光與家)
Wong Chun Shing
VTC Youth College

Secondary School Category



Second Runner-up

In my eyes;
Lo Wai Ching
Shatin Pui Ying College

* English translation by School of Engineering

Calendar of Events

July 5-9 & 12-16, 2010
HKUST-IBM Tech Explore Camp 2010
HKUST Campus

August 30, 2010
School of Engineering Orientation Day
HKUST Campus

September 18, 2010
Student Outreach Day
HKUST Campus

July 19-24 & 26-31, 2010
Youth IT Summer Camp
HKUST Campus

August, 2010
Tsinghua-HKUST Programming Contest 2010
Computer Science and Engineering Lab, HKUST Campus

October, 2010
Engineering Festival
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!

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