

“Science and  
Technology will  
**Shape**  
**the World's Future**”

— **Prof Philip Chan,**  
Dean of Engineering



## Dean's Message

This will be my last Dean's message for *In Focus*. By the end of August, I will have served as Dean of Engineering for six years and nine months. I am probably the longest serving head of the School in the short history of HKUST. The first and founding Dean of Engineering was Prof H K Chang, followed by Prof Ping K Ko and Prof Kang L Wang.

Faculty, students and alumni have accomplished a great deal over this time. In 2005, the first Times Higher Education Supplement league table for the World's Top 100 Universities in Technology appeared, with HKUST ranked 23 and number 1 in Greater China. Since then, our ranking has remained between 17 and 24. We should all be proud of this international recognition, a result of all the good work done since 1991 when HKUST was established.

During my tenure as Dean, the School has significantly expanded its international programs. About 25% of our undergraduates now take part in such exchanges and our partners have grown to 68 institutions in 15 countries. We have increased our self-financed taught postgraduate programs to meet local and regional needs. The School currently offers nine Master of Science programs from five departments, a major part of our postgraduate portfolio. We have also greatly extended our outreach and publicity as it is very important that the community learns about the wonderful achievements of our students and faculty. You have probably heard about us in the news or through features on the television.

One of the major challenges ahead is the implementation of the 3-3-4 undergraduate curriculum in 2012. The design and implementation of a new four-year curriculum is part of Hong Kong's massive undertaking to migrate to 12 years of school education and four at undergraduate level. To support the change, the campus will undergo a huge infrastructure building program, as well hire new faculty and staff to support the 33% increase in undergraduate enrollment. This is a once-in-a-lifetime opportunity as well as a once-in-a-lifetime challenge.

There is not the slightest doubt in my mind that science and technology will shape the world's future. Finding solutions to the most pressing problems facing humanity, such as the mitigation of global warming, the development of renewable energy sources and a cure for new infectious diseases will rely heavily on scientific discovery and technological development. The quest is to raise students' interest in science and engineering. This is particularly challenging in Hong Kong, as the society is focused on short-term investments and quick returns. We need to set our sights on the bigger arena – the Pearl River Delta and other parts of China. We have a good shot at becoming the leading university in science and technology in the Region. Let's go for it!

After 18½ years of development, the School of Engineering is now an adolescent. It is young and vigorous and ready to take on the world. I am very proud to be a member of it.

Wishing you all the best,



**Prof Philip Chan**  
Dean of Engineering



## Faculty Members

### ■ Prof Sunghun Kim

Assistant Professor, Computer Science and Engineering  
PhD - University of California, Santa Cruz

## Adjunct Faculty

### ■ Prof Martin Kwong

Professor, Civil and Environmental Engineering  
PhD - University of Hong Kong

### ■ Prof Chung-Dak Shum

Associate Professor, Computer Science and Engineering  
PhD - University of California, Los Angeles

### ■ Prof Zhihua Zhou

Professor, Computer Science and Engineering  
PhD - Nanjing University

## Visiting Faculty

### ■ Prof Wei Jiang

Associate Professor, Industrial Engineering and Logistics Management  
PhD - Hong Kong University of Science and Technology

### ■ Prof John Lau

Professor, Mechanical Engineering  
PhD - University of Illinois, Urbana

### ■ Prof Moses Ng

Assistant Professor, Mechanical Engineering  
PhD - University of Illinois, Chicago

## Administrative

### ■ Prof Christopher KY Leung

Appointed Head of the Department of Civil and Environmental Engineering



### ■ Prof Ross Murch

Appointed Head of the Department of Electronic and Computer Engineering



## “Green” Light for MTR-HKUST Project Extension



In an exciting move, a HKUST pilot scheme to introduce environmentally friendly lighting on the MTR has been extended from one carriage to a total of 24 carriages on three trains as well as stations. The project is led by Prof Ricky Lee, Department of Mechanical Engineering.

The first phase of the MTR-HKUST collaboration to install HB-LED SSL modules for carriage lighting was launched in October 2006 on the Tsuen Wan Line. In the second phase, the basic structure of the lighting modules developed by HKUST will be employed together with subsequent improvements, such as assembly substrates and protection circuits.

Research has shown that HD-LED SSL consumes 20% to 30% less electricity than conventional lighting with fluorescent tubes. In addition, its lifespan of 50,000 hours is at least five times longer than regular household fluorescent tubes, and three times that of the fluorescent tubes used on the MTR.

The result is a substantial reduction in the cost of maintenance, replacement and waste disposal, creating considerable environmental benefits.

Given the increase in scale for the second phase of the trial, HKUST has now teamed up with JM Solid-State Lighting Limited, part of the Jiuzhou Electrical Group, to form an industrial research consortium. The partnership has enabled the new generation of SSL modules to be assembled by fully automated surface mount technology, an essential quality and reliability improvement for mass production.

Prof Lee said many different aspects have had to be considered during the project, including mechanical structure, thermal management, electrical circuit, power consumption and optical performance. The reliability of the whole system has also been analyzed and carefully assessed.

“The main challenge is to develop HB-LED SSL modules that can overcome existing constraints, such as the limited space and power supply used for conventional fluorescent tubes, while generating equivalent optical performance,” Prof Lee said. “The development team also has to optimize energy efficiency and cost-effectiveness.”

Dean of Engineering Prof Philip Chan said the MTR has become a front-runner in adopting HB-LED SSL on subway trains, with the new technology due to be extended to general lighting in stations and back lighting in advertising boxes in the near future. “It is a visionary initiative,” Prof Chan said. “HKUST is very pleased to cooperate with the MTR in applying this emerging lighting technology to public transport. The collaboration also sets a good example of how tertiary institutions can contribute to local industry and the community.”

## Concrete Studies Seek to Build Durable Future



Professor Zongjin Li, Civil and Environmental Engineering, has been awarded a significant HK\$30 million project to conduct research on concrete under the major National Basic Research Program, also known as the 973 Program.

With China's infrastructure development progressing at a phenomenal speed – the country builds half of the world's new bridges and will have a highway network of 65,000 kilometers across the Mainland in five years – there is a pressing need for scientists to help to prolong the lifespan of structures and buildings, Prof Li said. The five-year study is the first 973 project to engage in studies of concrete.

The aim of the research is to achieve better understanding of the properties of contemporary concrete in order to address shortcomings such as early cracking and reduced durability. This will involve studying the hydration mechanism of contemporary concrete, microstructure

formation and its impact on the performance of concrete, as well as the deterioration of concrete under the combined effect of loading and environmental factors.

Prof Li's research on concrete hydration dynamics and non-destructive testing is recognized internationally.

"In the US, infrastructure with an intended lifespan of 75 years has an actual service life of 40 years. According to 2004 statistics, 27.5% of bridges in the US have a durability problem," he said. "In China, the number of bridges in danger has increased significantly since 2000, reaching 15,000 in 2005. The loss due to corrosion in reinforced concrete structure amounts to RMB 1 trillion per year."

As the project's chief scientist, Prof Li will work with a cross-border, multi-disciplinary research team comprising four other HKUST scientists and 50 scientists from seven universities in Mainland China. On the HKUST team are Prof Moe Cheung and Prof Chris Leung, Civil and Environmental Engineering, Prof Xiaoping Wang, Mathematics, and Zhenyang Lin, Chemistry.



## TD-SCDMA Mobile Services Proposal Selected

Prof Oscar Au, Electronic and Computer Engineering, and his team have had their mobile services proposal for the Hong Kong Cyberport TD-SCDMA Service Development Centre selected for display. The team's proposal offers a high-quality video streaming solution based on advanced video/audio coding techniques and optimized adaptive streaming algorithms. A total of seven proposals were chosen out of 23 received from the industry. The overall aim is to establish a test and development facility at Cyberport for TD-SCDMA application development and know-how.



## Mobile Air Monitoring in Macau



The state-of-the-art Mobile Real-Time Air Monitoring Platform (MAP), developed by researchers in the Department of Chemical and Biomolecular Engineering and the Institute for Environment, took part in its first air quality study project in Macau in February. MAP, which is housed in a van, enables continuous measurement while in motion, allowing high-quality data to be collected from places usually difficult to measure for air pollutant concentrations, such as tunnels and bus depots.

During the project, jointly initiated by the University of Macau, Macao Meteorological and Geophysics Bureau, and the Environment Council of Macao, MAP spent a week traveling around the Macau Peninsula and the islands of Taipa and Coloane to collect and analyze air quality data.

The study aimed to help the Macau community understand more about air quality distribution and changes in different areas, and to assist future planning. It was funded by Macau's Science and Technology Development Fund. Prof Chak K Chan, Chemical and Biomolecular Engineering, attended the project launch ceremony in February.

## Boeing Wireless System Project Seeks to Raise Maintenance Efficiency

Prof Gary Chan, Computer Science and Engineering, and his team of researchers are flying high these days, with a cutting-edge wireless system project for US aircraft manufacturer Boeing. The aim of the research, known as Lean Aviation Network or LAviNet, is to develop a system to enhance the efficiency of aircraft maintenance, repair and overhaul.

Aircraft maintenance is a huge and complicated operation, Prof Chan noted. Currently, large amounts of time are spent on paperwork, updating logbooks, signing off worksheets and commuting from the aircraft to the maintenance office. "There are millions of parts in an aircraft, and worksheets can run up to hundreds of pages," he said.

Through the use of wireless-enabled hand-held devices, LAviNet will help on-site maintenance crews to obtain worksheets, look up maintenance procedures, order spare parts, renew work cards, update log books and other essential tasks.

By setting out to raise efficiency in such maintenance operations, the LAviNet system can facilitate more productive use of aircraft, which in turn may increase revenue, Prof Chan explained. A reduction in commuting will allow staff to concentrate more on the actual maintenance work. Decreasing the number of printouts will also be more environmentally friendly.

Preliminary research on LAviNet is underway, with design testing and commissioning expected to take two years. The project is also supported by Hong Kong Aircraft Engineering Company (HAECO) and Altai Technologies Limited, a spin-off company from Hong Kong Applied Science and Technology Research Institute (ASTRI).

The LAviNet project is a further development in the HKUST-Boeing research relationship. In 2007, HKUST became the first and only university in Hong Kong chosen to develop two wireless communication projects for Boeing's commercial planes. The first focused on seamless connectivity support for Boeing's line maintenance technicians, while the second enabled line maintenance technicians to quickly and safely form a team to check a plane parked away from wireless access points. The research team was led by Prof Lionel Ni and Prof Qian Zhang, both from Computer Science and Engineering.



## Joint Telecoms R&D Lab Underway



HKUST has signed a research and development agreement with Huawei Technologies Co Ltd, a leading next-generation telecommunications networks provider, to explore cutting-edge telecoms, wireless and related emerging technologies.

The HUAWEI-HKUST Innovation Laboratory, Huawei's first R&D lab in Hong Kong, will connect researchers from industry and academia and serve as an enterprising model for industry-university research collaborations. The Computer Science and Engineering Department and Electronic and Computer Engineering Department are expected to work closely on joint projects with Huawei.

The agreement was signed by Prof Matthew Yuen, Acting Vice-President for Research and Development, and Mr Jun Shu, Vice-President, Research Department, Products & Solutions at Huawei, at an opening ceremony for the laboratory on April 16, 2009.



## Software Library Donation

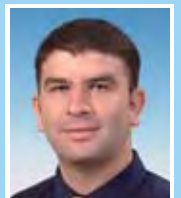
Electronics solutions supplier Rohde & Schwarz Hong Kong Ltd has donated a software library to HKUST's Center for Wireless Information Technology CenWIT. The library consists of baseband simulation tools for 3G and WiMAX systems, which can be used for education, training and research. The donation may also support research and development of the next generation of wireless systems.

## Faculty Honors, Awards and Achievements

- Prof Khaled Ben Letaief, Electronic and Computer Engineering, has won the prestigious, annual IEEE Marconi Prize Paper Award in Wireless Communications for his paper, "A Unified Cross-Layer Framework for Resource Allocation in Cooperative Networks", which appeared in the 2008 August issue of *IEEE Transactions on Wireless Communications*. Papers are judged and evaluated on originality, utility, timeliness, and clarity of presentation by the IEEE Communications Society and the IEEE Signal Processing Society. Another paper published by Prof Ben Letaief was ranked number one in documents accessed in the *Proceedings of the IEEE* in May 2009. The paper, titled "Cooperative Communications for Cognitive Radio Networks", was also ranked 13th in the top 100 papers accessed through IEEE Xplore in May 2009.



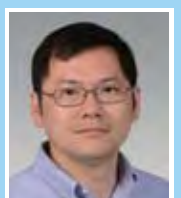
- Prof Amine Bermak, Director of Computer Engineering Program, has been awarded the 2008 Computer Society Certificate of Appreciation for serving as General Co-Chair at DELTA 2008, an IEEE conference organized at HKUST. The award is given annually to individuals who have provided outstanding services and contributions to Test Technology Technical Council programs and activities.



- Visiting Professor Vijay Bhargava, Electronic and Computer Engineering, has been awarded a Distinguished Visiting Fellowship by the Royal Academy of Engineering. As part of the fellowship, Prof Bhargava will present seminars at different UK universities, including the University of Kent, University College London, University of Edinburgh and Cambridge University.



- Prof Chak K Chan, Chemical and Biomolecular Engineering, has been appointed an editor-in-chief of *Atmospheric Environment*. Prof Chan is the journal's eighth editor-in-chief and the first from outside the US and Europe. *Atmospheric Environment*, which celebrates its 50th anniversary this year, focuses on air pollution research and its applications. It published over 700 papers in 2007.



- Prof Christopher Chao, Mechanical Engineering, has been invited by the US government to serve as a scientific steering committee member in the Office of Public Health and Environmental Hazards in the Department of Veterans Affairs. He will advise on allocation of resources in areas related to infectious disease control and prevention in Veterans Affairs Medical Centers across the US. This is a prestigious opportunity to become involved in an area that usually involves medical experts rather than engineers.



- Prof Mordecai Golin, Computer Science and Engineering, has been awarded HKUST's Michael G Gale Medal for Distinguished Teaching. Prof Golin, an expert in the design and analysis of algorithms, has twice been voted one of the Top Ten Best Lecturers by HKUST students. He is also a four-time recipient of the School of Engineering Teaching Award.



- Prof Jeff Hong, Industrial Engineering and Logistics Management, has won the IIE Transactions Best Paper Award - Operations 2009 for his paper "Selecting the best system when systems are revealed sequentially", coauthored with Barry L. Nelson of Northwestern University.



- Prof Edmond Ko, Chemical and Biomolecular Engineering, was voted one of the Best Ten Lecturers 2008. The annual honors are an independent initiative organized by HKUST students. The awards show students' appreciation for their teachers' work.



- Prof Irene Lo, Civil and Environmental Engineering, and her former PhD student, Dr Keith C K Lai have received the 2009 Wesley W Horner Award from the Environmental & Water Resources Institute of the American Society of Civil Engineers for their valuable contribution to the environmental engineering profession. They received the accolade for their paper "Effects of Seepage Velocity and Temperature on the Dechlorination of Chlorinated Aliphatic Hydrocarbons", becoming the second Asian researchers to be honored in the award's 41-year history.



- Prof Ross Murch, Electronic and Computer Engineering, has been elected an IEEE Fellow, taking the total number in the department to 13. Prof Murch gained the honor for his pioneering work on multiple antenna systems which revolutionized modern wireless communication systems. He is a leading global contributor in this field. He is also an Area Editor for *IEEE Transactions on Wireless Communications* and has had 20 patents granted or in progress.



- Prof QP Sun, Mechanical Engineering, together with other people, have been awarded the Natural Science Award of Minister of Education in 2009.



- Prof Qiang Yang, Computer Science and Engineering, has been elected an IEEE Fellow for his "contributions to the understanding and application of intelligent planning, learning and data mining".



- Prof Limin Zhang, Civil and Environmental Engineering, was the recipient of the 2008 Young Mao Yisheng Award by China Civil Engineering Society. This award is nominated every two years for a researcher or practicing engineer under the age 45 who has made significant contributions in soil mechanics and geotechnical engineering. The award ceremony was held on 15 May 2009.



- A paper published by Dr Wei Zhang and Prof Khaled Ben Letaief, Electronic and Computer Engineering, was one of the top 100 papers accessed through IEEE Xplore in January 2009. Their paper "Cooperative Spectrum Sensing with Transmit and Relay Diversity in Cognitive Radio Networks" was published in the December 2008 issue of *IEEE Transactions on Wireless Communications*.

## Technology to Fast Forward the Future

*HKUST Fok Ying Tung Graduate School, located 90 minutes away from Hong Kong within the Nansha IT Park in the Pearl River Delta, has added another dimension to the University's ability to advance technology and enhance people's lives*

The HKUST Fok Ying Tung Graduate School, the University's fifth school, was set up in January 2007 to play a key role in HKUST's development in Mainland China, particularly in education and research. Currently, the School has 11 research centers, two joint laboratories, one research program and one central research facility covering four technology areas – Information and Communications Technology, Advanced Materials, Environment & Sustainable Development and Biomedical & Biotechnology – in line with HKUST's strategic focus.

The following explores the cutting-edge work being carried out at three of the School's research centers.

## Digital Life Research Center (DLRC)



DLRC focuses on digital technology and how it can be deployed to create a "Digital Life". This concept centers on the use of digital technology to connect mobile phones, computers, sensors and household appliances. As a result, people previously bound by complex and separate devices can enjoy a more convenient, efficient and comfortable lifestyle. The Center's major research fields are smart phones, sensor networks and radio-frequency identification (RFID).

Smart phones enable data to be easily transmitted and make more services possible to improve people's lives. One innovative project involving smart phones is the Digital Medical Care – Telemedicine Healthcare System, which allows a patient's medical condition to be monitored remotely by doctors and relatives. The patient uses an intelligent device to collect remote physiological parameters, which are then transmitted to the patient's smart phone for analysis. If the data appears abnormal, the smart phone automatically sends an alert to a telemedicine healthcare center and the person's relatives. In addition, doctors at the healthcare center can give real-time feedback to patients.

In a wireless sensor network, a large number of sensor nodes are deployed in the physical world. The sensors monitor environmental conditions and perform simple digital analysis, with the data collected in a computer. Such technology has many applications. For example, sensors could identify an absolute position from the data collected, facilitating rescue work and allowing more informed decisions on mapping out evacuation routes.

RFID technology can be employed for guidance, tracking, and to rapidly locate items. At present, though, there are still technological limitations, especially related to the tags used for identification. At the DLRC, work is ongoing on the  $\alpha$ -Gate Portal, a HKUST patented technology, to increase efficiency. The Portal can scientifically analyze environmental effects on an RFID system then fix the best position for the antenna to ensure that all tags can be read accurately. This technology is expected to have a large market, especially in the logistics, storage management, supply chain management, and transportation monitoring sectors.





## Advanced Composite Materials Technology Research Center (ACMT)



ACMT's mission is to develop advanced composite materials technology and its applications for Pearl River Delta and Mainland industries. Composite materials are light, strong, corrosion-resistant, and flexible to design and mold. This special combination of properties allows them to be used in many different industries, ranging from aerospace and automobiles to shipbuilding, infrastructure, wind power and recreation.

ACMT engages in different research projects to develop composite materials technology and applications. For example, a roadside crash barrier made of composite materials may reduce injuries if a vehicle crashes into it. The Center will continue to push the frontiers of such technology, working in cooperation with the automobile and other industries in the Pearl River Delta and elsewhere in the Mainland.



## Center for Polymer Processing and Systems (CPPS)



Polymers are widely used today due to their inherent high-performance properties, which include being light and corrosion-resistant. Products range from simple plastic toys to high-value products, such as automobile components, instrument panels and DVDs.

Polymer processing is an engineering specialty involving the conversion of plastic pellets or powders into the desired shapes and functions for different products. The control system for polymer processing machinery is the key challenge and still a weakness in China. CPPS's aim is to improve the level of control technology for China's plastic processing-related industries. To this end, CPPS is developing a low-cost high-precision injection molding control system and extrusion control system, and other related useful polymer processing auxiliary products.

CPPS is also interested in automation systems for other industrial processes. Advanced motion control, process control and monitoring technologies can be used to achieve better product quality, high efficiency, energy saving, environmental protection and other benefits. Currently, CPPS is working on an auto-spray paint system which will improve production processes in the plastic toy sector. The system will save on raw materials and environmental impact by using 40% less paint. The auto-spray also accommodates different colors and improves the quality and consistency of the painting. CPPS will continue to work on this technology and to apply it to production processes in other industries.





## Social Service Co-curriculum Course Launched

In February, the School of Engineering launched its first credit-bearing co-curriculum course aimed at increasing students' involvement in the community through social service.

The enterprising soft-skills course saw the first intake of 20 SENG students engaged in bringing technology to both young and old in Hong Kong. Projects introduced pre-school children at the TWGHs Lions Club of Metropolitan Hong Kong Kindergarten and the elderly at the Po Leung Kuk Lau Chan Siu Po District Elderly Community Centre to the MoXi digital ink art computer software, developed by a SENG PhD graduate Nelson Chu Siu-hang, to boost interest in drawing. Students also taught the senior citizens how to access internet resources, such as online news, and designed special games to assist the elderly in learning about new gadgets.

The program, developed and led by Professor Charles Ng, Associate Dean of Engineering – UG Studies, was co-organized and sponsored by the Lions Club of Metropolitan Hong Kong (Metro Lions), with members of the Metro Lions and their junior counterparts, Metro Leos, participating as mentors.

Along with practical experience, students learnt about the development, implementation, execution and evaluation of a social service project. Training in leadership, public relations, as well as event management, communication and presentation skills was also provided.



MoXi drawings by elderly





Course speakers included Timothy Kam-wah Ma, Executive Director, Senior Citizen Home Safety Association, Metro Lion Frankie Yeung, Senior District Director, AIA Co (Bermuda) Ltd, and Herman Hu Shao-ming, JP, Chairman of Ryoden Development Ltd. Mr Hu is an engineering graduate and holds key positions in 16 associations.

Students came from all undergraduate years and included Hong Kong, Mainland China and overseas students. Professor Ng said: "This course focuses on nurturing a socially responsible culture among engineering students. With students from different nationalities, it also provides a platform for cultural exchange."

Sadique Mohamed Salih, a Year 2 student who took part in the inaugural class, said: "I have never thought of developed city like Hong Kong also suffers from poverty. I fully appreciate the opportunities given in my life when I discovered that there are shanty town and metal sheet houses in HK. This gave a great impact on me and I decided to join this program to help the others."

Metro Lions President Fred To said the group was committed to developing, improving and promoting education in Hong Kong. He hoped the SENG community service project would encourage its engineering students to learn about society and provide services to those in need.



MoXi drawings by kindergarten kids



## Entrepreneurial Undergraduates Win Business Plan Competition



In an outstanding display of enterprise, technical skill and effective communication skills, three School of Engineering students gained the top prize at the YDC Entrepreneurs' Challenge 2009 Business Plan Competition in June.

Showing that it does not take a business student to win an entrepreneurial contest, the Tech4Enviro team comprising Mingyu Wang (2009 graduate, Electronic and Computer Engineering), Shucheng Zhu (2009 graduate, Computer Engineering), Daijun Zhou (2009 graduate, Industrial Engineering and Logistics Management) and Cong Xie (2009 graduate, Economics) was awarded the championship for their striking GPS Robotic Water Analyzer innovation.

The team impressed the judges with their novel invention for efficiently and cost-effectively monitoring and analyzing water quality. The students constructed a robotic boat with chemical sensors, and automatic navigation utilizing GPS, that can monitor water quality in target areas and transmit the data back to the control station.

As the victorious team, Tech4Enviro will now gain the opportunity to join overseas business plan competitions. Around 240 teams, comprising over 900 students from different local universities, took part in this year's YDC business plan contest. The event has been organized annually for the past 10 years in collaboration with Stanford University.

"As engineering students, winning this competition was not an easy task," Mingyu noted. But participation in the contest and the team's hard work would have many long-term benefits, he said. "I gained experience in how to write a successful business plan, how to make a convincing presentation, and to lead a team."

The energy-efficient and affordable water analysis system was initially developed as a Final Year Project, with

the idea of subsequently launching a start-up. "Shucheng and I were roommates," Mingyu said. "We almost turned our dorm into a lab with our tools and accessories. We spent days and nights there working on the project."

As the team dedicated themselves to the task of developing the original system, they received great support from HKUST academics, especially project supervisors Prof Zexiang Li, Electronic and Computer Engineering and Prof Xiaoyuan Li, Chemistry. "Prof Zexiang Li is a successful entrepreneur himself," Mingyu said. "He encouraged us to start our own company and his entrepreneurial behavior influenced us tremendously."

Other academics that helped to develop Tech4Enviro's capabilities and mindset included Prof Jeroen Kuilman, Department of Management, Prof Roger King, Adjunct Professor of Finance and Prof Mitchell Tseng, Industrial Engineering and Logistics Management. The essential skills of constructing a business plan and insight on venture capitalist perspectives were among the useful knowledge gained. "I am grateful to everyone who assisted us along the way," Mingyu said.

Shucheng found the contest enabled him to put knowledge learned from courses into practice. "From this competition, I learned every successful business requires not only thorough market research and sophisticated financial analysis but also efficient, harmonious teamwork," he said.

Daijun Zhou added: "YDC is an excellent channel for engineering students to incubate their business sense." The combination of good engineering training provided by HKUST combined with the team's own creative vision were the most important factors in Tech4Enviro's success, he said.

First runner-up in the YDC competition was Lighten, a team from the University of Hong Kong. The second runner-up was ReBone, comprising students from the Chinese University of Hong Kong.



## Innovative Success at Samsung Creative Technology Contest



In a dynamic display, students from the School of Engineering gained five accolades at the Samsung Joint Universities Creative Technology Awards in February.

The contest, which drew a total of 74 teams, encourages young people to be both creative and appreciative of the world. This year's theme was to transform old objects into something new and useful for the community. Students had to write proposals to explain their ideas, build prototypes, and present their work to judges.

Twelve teams from five universities took part in the finals at Cyberport. The SENG winners were:

- *Excellency Award + Most Creative Award:* Ming Tak Lau, Ka Man Lau and Po Chu Lam (Year 3, Electronic and Computer Engineering), "Embedded Cognitive Therapy in a Digital Photo Frame"

- *Excellency Award + Most Caring Award:* Patrick Kwan Pak Lee, Hoi Ki Woo and Ning Ching Chan (Year 2, Electronic and Computer Engineering), "Braille Printer"

- *Technical Competency Award:* Chi Ho Yeung and Lap Fai Yu (MPhil, Electronic and Computer Engineering and Computer Science and Engineering) and Yik Hei Chan (Year 2, Electronic and Computer Engineering), "The Possible Life"



## Eight Awards at Youth Design Contest



In an award-winning display of creativity and social awareness, School of Engineering students won eight accolades at the 2008-09 Hong Kong Youth Design Competition.

The contest, which seeks to raise awareness of elderly care and social responsibility among the younger generation, requires students to research and design new products that can assist senior citizens. Teams from the Department of Electronic and Computer Engineering, and Computer Engineering Program, participated.

Elderly center visits to discuss inventions and to learn more about the needs of older people and opportunities to sharpen technical and presentation skills were just some of the valuable experiences of joining the competition, students said. Winning ideas from HKUST included a GPS-based tracking system for the elderly; an electronic pill container which reminds elderly to take medicine by automatically dispensing the pills on time; a digital photo frame that transforms paper-based cognitive training programs into a digitized format and re-packages them into easily-accessible games, etc. Prof Tim Woo, Electronic and Computer Engineering, leads students to participate in different competitions and attain outstanding achievements.

More than 50 teams from tertiary institutions took part in the contest, with a final presentation and exhibition of entries held at the Hong Kong Science Museum on March 14.

Category	Award and design	HKUST teams
Creative designs for elderly assistive devices	Champion – eCube	John Chun Yung Wong, Chun Fai Cheng, Vincent Kam Tim Cheng (2009 graduates, Electronic Engineering)
	Most Creative Award – Embedded Cognitive Therapy in Digital Photo Frame	Ming Tak Lau, Carmen Ka Man Lau, Rainy Po Chu Lam (2009 graduates, Electronic Engineering)
Creative designs for elderly home appliances	Most Creative Award – Automatic Volume Remote Controller	Chun Sing Lo, Wai Chung Suen, Man Yin Kwan (2009 graduates, Electronic Engineering)
	Most Practical Award – Pills on Time	Esther Pui Yin Wong, Philip Li, Kelvin Ming Fai Leung (Year 3, Electronic Engineering)
Creative designs to enhance standard of living	Champion – GPS-based Elderly Tracking System	Andy Ho Ting Chan, (2008 graduate, Computer Engineering), KiKi Fung Kei Chong, Gloria Lai Yan Kong (2008 graduates, Electronic Engineering)
	Certificate of Merit – Electronic Controlled Power Supply	Feilee Fei Lee Li, Helen Nga Ying Ching, Karen Ching Yu Wong (2009 graduates, Computer Engineering)
	Certificate of Merit – Fishing Game	Walter Ying Lun Tsui, Jason Yan Man Lai, Pak Ming Cheung (2009 graduates, Electronic Engineering)
Institution	Organization with the most participants	HKUST

## Student Honors, Awards and Achievements

- Final-year students Chin Pang Chan, Ming Pui Chan and Hon Kwok Li, Electronic and Computer Engineering, have received the Varitronix 30th Anniversary Scholarship for the Best Final Year Project on Display Technology. Their project focused on "Photo-Aligning Materials and Technology: Physics and Application in Liquid Crystal Devices".



- A study initiated by Adrien Kam-cheuk Chan, Year 2, Chemical and Biomolecular Engineering, and its results were publicized in the *South China Morning Post* newspaper. The study discusses the impact of the "canyon effect" on the level of ultrafine air pollutants in Hong Kong.

- Ken Cheng, Year 3, Mechanical Engineering and General Business Management, and Alice Ma Yu Hui, Year 2, Mechanical Engineering, have been selected to join the Boeing-Cathay Pacific Engineering Internship. Only four students from Hong Kong were chosen to go on the program. Ken and Alice will work in the Boeing factory in Seattle for six months, where they will receive training and valuable work experience.

- Industrial Engineering and Logistics Management student team Wing Yee Choi, Hei Yan Ip, Chiu Fai Wong and Tsz Hang Tsang, Year 3, and Pui Sum Kwok, Year 4, Logistics Management and Engineering and General Business Management, won the CILTHK Student Day Championship 2009. CILTHK Student Day was organized by the Department of Industrial Engineering and Logistics Management and the Chartered Institute of Logistics and Transport in Hong Kong (CILKHK) and held on March 21. The team was allowed 1½ hours to prepare a 10-minute presentation on an assigned topic.



- Connie Hiu Ying Chow, Year 4, Chemical and Bioproduct Engineering and General Business Management, has been awarded \$10,000 from Dow Scholarships for 2008-09.

- Mechanical Engineering Final Year Design Project Group Chiu Yu Lam, Tsz Kuen Lam, Tat Kwan Man, Yiu Ming Wan and Cheuk Ling Wong garnered the bronze prize at the Jardine Engineering Corporation (JEC) Outstanding Engineering Project Award 2007-08. Their project centered on a sorting mechanism for diamonds. The contest attracted 15 entries from five local universities.



- PhD student Yong Lin, Chemical and Biomolecular Engineering, had her paper "Effects of Surface Modification of the Filler on the Impact Toughness of Polypropylene/CaCO<sub>3</sub> Nanocomposites" nominated for the Excellence in Graduate Polymer Research Symposium 2009 in Salt Lake City, Utah. Selection for the symposium is an honor among the polymer community.

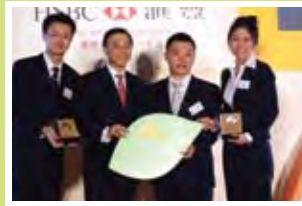
- MPhil graduate Tsz Yan Ling, Chemical and Biomolecular Engineering, has been awarded a fellowship by the Abplanalp Sanders Memorial Fellowship Fund in the US. The fund supports students involved in research related to aerosols in consumer products or pharmaceutical applications.

- Student team Kaibo Liu, Year 3, Ye Gong, Yang Yang, and Qingxiang Wang, Year 2, Industrial Engineering and Logistics Management (IELM), took the championship in the HKSQ Student Project Competition, organized by the Hong Kong Society for Quality in April. Another IELM student team, comprising Miu Yin Ma, Matthew Ho Ming Luk, Chi Chung Kwan, and Alex Shaw Liang Yap, Year 2, was first runner-up. The competition allows students to work on an actual industrial case and propose a solution, giving them experience of resolving a real-life problem.



- PhD graduate Jeffery Lo, Mechanical Engineering, gained the Young Paper Award at the IEEE 9th VLSI Packaging Workshop, held in Kyoto, Japan. His winning paper focuses on "Numerical Analysis and Experimental Validation for the Prediction of Flip Chip Solder Joint Standoff Height in MEMS Microphone Application". It was co-authored by SW Ricky Lee.

- Dual degree student Swan Lu, Year 2, Chemical Engineering and General Business Management and her team received the silver prize and the Eco-Business Innovation Award at the HSBC Young Entrepreneurship Awards 2008-09.



- PhD student Xiaosu Ma, Civil and Environmental Engineering, received the Outstanding Student Paper Award from the Hong Kong Society for Transportation Studies for the paper "Impact of Time-dependent Transport Management on Activity Location Costs".

- Mingyu Wang, 2009 graduate, Electronic and Computer Engineering, and Shucheng Zhu, 2009 graduate, Computer Engineering Program, have won HKUST's 2009 President's Cup Gold Award for their project entitled "GPS Robotic Water Analyzer". The team also won second prize in the Best Final Year Project category of the Hang Seng Green Challenge Student Project Competition. Another outstanding student team, including Year 1 international student, Meenakshi Sundaram Ragavan, Electronic and Computer Engineering, also won a second prize in the interdisciplinary category of the contest for their project "Reducing Paper Use in Computer Barns".



- PhD student King Yuen Wong, Electronic and Computer Engineering, gained the ISPSD'09 Charitat Award for Best Student Paper at the 21st International Symposium on Power Semiconductor Devices and ICs held in Barcelona, Spain in June. ISPSD is the premier forum for technical discussions on power semiconductor devices, power integrated circuits, their hybrid technologies, and applications. King Yuen's paper, "Integrated Voltage Reference and Comparator Circuits for GaN Smart Power Chip Technology" was co-authored by Wanjun Chen and Kevin Chen.



- The Civil and Environmental Department enjoyed a double success recently, with MPhil graduate Chun Ying Yu winning the Fugro Prize 2008-09 and MPhil graduate Chun Hung Ma

named first runner-up. The prize is organized by the Geotechnical Division of the Hong Kong Institution of Engineers and recognizes study, research or project work that makes significant contributions to the advancement of geotechnical practice in Hong Kong.



- Final-year student Charlie Shucheng Zhu, Computer Engineering Program, has received a fellowship from Princeton University to undertake his PhD. He will study in the Department of Electrical Engineering.



- HKUST undergraduate teams achieved great success in the annual IBM DB2 UDB Inter-University Programming Contest 2009 in February, winning the Champion University Award. They achieved the highest combined score in comparison with teams from other universities. This year's contest attracted 37 teams from seven universities in Hong Kong and one university in Macau. HKUST team members included computer science students Ka Chun Wong (Year 3), Yuliang Li (Year 0), Ka Cheuk Yu (Year 3), Zhepeng Yan (Year 2), Chen Chen (Year 3), Maocheng Li (Year 2), Sing Fu Chan (Year 3), Ka Wai Lee (Year 3), Zhou Zhao (Year 2), Desmond Chiu Lung Hung (Year 1), Qifeng Chen (Year 0); computer engineering students Wing Kwun Lam (Year 3), Chun Wing Kwok (Year 3), Cheuk Ki Ng (Year 3); and information systems, business statistics and operations management student Kai Hong Wong.



- At the ACM Asia Regional Programming Contest in Ho Chi Minh City, the HKUST programming team comprising Chen Chen (Year 3), Qifeng Chen (Year 0), and You Wu (Year 2), Computer Science and Engineering, won the first prize and was ranked in fourth place. The top four teams solved the same number of questions, but the HKUST team used slightly more time. The same team also gained sixth place in Taipei.

# Enriching the Learning Experience



A student fund, administered by the Student Affairs Office, has been launched at HKUST to promote voluntary service and projects that foster a vibrant learning community and caring

spirit on campus.

One of the first 10 to receive support from the new Student Enrichment Activities Fund was Alex Yap, Year 2, Industrial Engineering and Logistics Management and International Service Director of the Rotaract Club at

HKUST. Alex organized a donation drive to buy pens for rural school children in Mainland China. The Fund subsidized the publishing of a booklet to help others on campus learn from this experience.

Alex decided on the drive after he learnt from Sowers Action, the charity helping to organise a Rotaract service trip to the Mainland, that pens were difficult for such children to acquire. In three days last Fall, Alex and his members collected over HK\$20,000, enabling 2,000 pens to be donated. The success of this campaign proves that teamwork and the kindness of the campus community can make an impact," he said.

## Korea Case Competition Offers Cross-cultural Team Insight



Sixteen students from the high-flying Dual Degree Program in Technology and Management (T&M) joined US and Korean counterparts at the enterprising C40 Cities – Technology & Management International

Case Competition Seoul 2009 in January.

During a fascinating week in Korea, the Hong Kong students worked together in cross-cultural teams with T&M peers from the University of Illinois at Urbana Champaign, Seoul National University (SNU) and Korea University (KU) to develop green business proposals. They also visited major Korean companies, university campuses and had the opportunity to interact with Korean government officials during the meeting with the City of Seoul.

The teams then presented their ideas to a panel of judges from academia, government and industry and a winning proposal was selected. The proposal is about providing adaptive rooftop landscaping solutions for Seoul in the form of full product-service packages designed to reduce energy costs and enhance building characters while reducing local carbon concentrations and bringing natural beauty into urban life. "The international experience brought me new understanding of team-building and cultural differences," said Yennie Ma, a HKUST member of the victorious team. "I really value the friendships that developed during the competition."

Swan Lu, also from HKUST, echoed the value of participating in the innovative case contest. "This was an unforgettable, once-in-a-life business competition," she said. "It was meaningful to learn more about sustainable business and great cultural exposure."







## IELM Homecoming Dinner Launches 15th Anniversary Events

In celebration of the Department of Industrial Engineering and Logistics Management's (IELM) 15th anniversary, a series of activities has been arranged throughout 2009. Organized by Prof Fugue Tsung, events got underway on February 28 with a well-attended 15th Anniversary Homecoming Dinner at HKUST. Around 200 alumni and all IELM faculty members joined the event.

Other highlights have included the CILTHK Student Day 2009 in March, coordinated by IELM and the Chartered Institute of Logistics and Transport in Hong Kong (see also Student Honors, P.14), and a keynote speech on recent developments in industrial engineering in Greater China at the Institute of Industrial Engineers (Hong Kong) annual dinner by Prof Tsung, the Institute's Regional Vice-President (Asia), in April.

In addition, IELM organized the first 2009 INFORMS International Conference on Service Science at HKUST from August 6-8. This enabled insightful discussion on many different topics related to service science, engineering and management. Special sessions focused on logistics service, financial service, and service quality (quality techniques for the service industry). There were also keynote speeches by Prof Way Kuo, President of City University of Hong Kong, Prof Candace Yano, UC Berkeley, and Dr Grace Lin, IBM.



## Postgraduate Society Launched

The Mechanical Engineering Postgraduate Society has been established to promote a closer relationship between postgraduate students and faculty. Several well-received activities had been organized to date, including a basketball match, career seminar, New Year gathering, and boat trip. The society's website can be viewed at <http://ihome.ust.hk/~mepgs/index.html>.

## Impressive Start for Mentorship Program

The Department of Mechanical Engineering's new mentorship scheme has generated a tremendous response, attracting 38 mentors and 42 students. The program has been launched to assist undergraduates' self-development and enhance career prospects. Alumni and other mechanical engineering professionals have come forward to act as role models, offer guidance, and provide students with personal and professional links to the industry. The Department hosted an inauguration dinner for the program on March 13, which was attended by 70 mentors and students.

## Anniversary Celebrations Showcase Department

The Department of Chemical and Biomolecular Engineering is celebrating its 15th anniversary this year. A series of special events got underway on February 12 with the Department's Annual Dinner, attended by students, alumni and academics. Another highlight was Industry Day on April 15. As the only chemical and biomolecular engineering department in Hong Kong, strengthening partnerships with the industrial sector, both locally and internationally, is important. Industry Day provided a great opportunity to reinforce ties with government and industry leaders, and showcase the Department's work, its students and applied research.



## Youngsters Take Up Robotics Challenge

In April, the Department of Computer Science and Engineering hosted the annual RoboCupJunior Hong Kong contest together with the Hong Kong Federation of Education Workers and Electronic Technology Publishing Group. This year, 130 teams from 69 primary and secondary schools took part. It was the fifth time that CSE has co-organized the event.

The aim of RoboCupJunior, a project-based initiative, is to support learning and fire up enthusiasm toward robotics among students up to the age of 19. The finals at HKUST's S H Ho Sports Hall were keenly contested and highly entertaining. At the primary level, teams from Hong Kong & Macau Lutheran Church Primary School (dance) and Salesian Yip Hon Primary School (rescue and soccer) eventually won the day in their respective categories. Students from Buddhist Ho Nam Kam College (dance), Carmel Secondary School and PLK Centenary Li Shiu Chung Memorial College (rescue), and Kau Yan College (soccer) took the top awards at secondary.



## Employers Provide Job Market Insight

Representatives from leading telecommunications services company CSL HK Ltd. and network & security technology provider Cell Technology Ltd. gave an interesting careers talk on the current job market to over 60 undergraduate and postgraduate students from various engineering departments in March 2009. The successful event was co-organized by the Department of Electronic and Computer Engineering and the Computer Engineering Program Students' Society.

## Faculty-student Social Exchange

It has been a busy time for the Electronic and Computer Engineering (ECE) Students' Society. In November 2008, the group invited faculty members to share their professional experience with students at an informal dinner gathering, which is part of the Mentorship Program the Society coordinates every year. Attendees included both ECE and non-ECE students and all enjoyed a great evening with the professors, gaining valuable insights on how to make the most out of university life. Within the same month, the group organized the ECE Annual Dinner, which is one of their major events of the year. Students and faculty again gathered for a fun event, including games and a lucky draw. It was certainly a highly memorable event.



## Bridge Contest Inspires Budding Engineers

Suspension bridges were the theme of this year's popular Secondary Schools Bridge Design Competition 2009, organized by the Civil and Environmental Engineering Students' Society and the Department of Civil and Environmental Engineering in February.

The contest aims to boost interest in civil engineering among secondary students; to provide school students with an opportunity to gain hands-on experience through the design and construction of a model structure; and to strengthen friendships and idea-sharing among school students, academics, and the community.

A total of 10 teams from 10 different schools joined the competition and four teams were selected to compete in the finals: Hong Kong Chinese Women's Club College, Po Leung Kuk Yao Ling Sun College, Chiu Lut Sau Memorial Secondary School and Holy Trinity College. Finalists' model bridges were judged on the basis of a loading test (50%), a presentation by the teams (40%) and the appearance of the bridge (10%). It proved an



exciting contest, with Po Leung Kuk Yao Ling Sun College eventually named the overall champion.

Other participants comprised: Concordia Lutheran School – North Point, Yan Oi Tong Tin Ka Ping Secondary School, Our Lady of the Rosary College, Shun Lee Catholic Secondary School, Heep Yunn School and Tung Wah Group of Hospitals Chang Ming Thien College.

On the judging panel were Ir Prof Andrew Y T Leung, Chairperson of the Hong Kong Institution of Engineers Civil Division, Ir Alan S L Low, Institution of Highways and Transportation Hong Kong Branch, and Prof C C Chang, Civil and Environmental Engineering, HKUST.

## ALUMNI

- Dr Kyoung-jin An, PhD in Civil and Environmental Engineering in 2006, has been working as Assistant Professor in the Department of Urban Engineering at the University of Tokyo since April 2009.
- Dr Jing Bie, PhD Civil and Environmental Engineering 2008, has joined the University of Twente in the Netherlands as an Assistant Professor in the Department of Civil Engineering.
- Dr Yo-Sub Han, PhD Computer Science and Engineering 2005, has joined Yonsei University, Korea, as an Assistant Professor.
- Dr Oscar K S Hui, PhD Mechanical Engineering 2008, has become a lecturer in the Department of Manufacturing Engineering and Engineering Management at City University of Hong Kong.
- Dr Philip Chi Wai Kwong, MPhil Mechanical Engineering 2005 and PhD Environmental Engineering Program 2009, has been offered a lecturing position in the School of Chemical Engineering, University of Adelaide, Australia.
- Dr Louis Koon Fung Lam, BEng Chemical and Biomolecular Engineering 2002 and PhD Environmental Engineering 2006, has been awarded a Newton International Fellowship for 24 months at University College London, UK. He previously received an Alexandre Yersin Excellence Fellowship for 18 months at CNRS, Lyon, France.
- Dr Kelvin Ng, PhD in Civil and Environmental Engineering in 2008, has become an assistant professor in the Department of Environmental Systems Engineering at the University of Regina, Canada.
- Dr M P Wan, PhD Mechanical Engineering 2006, has become an assistant professor in the School of Mechanical Engineering at Kyungpook National University, Korea.
- Dr Peng Wang, now in the Environmental Engineering Program, has been offered an assistant professor post in the Division of Environmental Science and Engineering at King Abdullah University of Science and Technology (KAUST), Saudi Arabia.
- Dr David Z W Wang, PhD Civil and Environmental Engineering 2008, will join the Nanyang Technological University in Singapore this coming fall as an Assistant Professor in the School of Civil and Environmental Engineering.
- Dr Barbara Siu, PhD Civil and Environmental Engineering 2009, has just joined the Hong Kong Polytechnic University as a Lecturer in the Department of Civil and Structural Engineering.



## SENG Student Ambassadors 2009/2010

In March 2009, 27 students from SENG departments and program were appointed as Student Ambassadors (SAs) to help promoting HKUST, engineering and its diverse disciplines. In the coming year, they would go through a series of training exercise and be engaged in various outreaching activities. These future engineers are geared up to introduce engineering to the society and to build a better world in concerted efforts.

### Front Row (From left to right)

Anson Yan Ning Cheung, Wang Kit Li, Janice Sin Hang Choy, Jessica Ho, Homan Ho Man Ho, Novia Nok Kwan Wong, Rick Chi Ho Chan, Alex Lik Hang Chau, Simon Wai Yin Lau, Steve Wing Hin Yeung, Thomas Pak Cheong Tam, Kin Yip Tsoi, Tom Ka Shing Chan

### Back Row (From left to right)

Betty Qi Chen, Alan Yen Shuo Chen, Roland Wai Lun Tse, Alice Oi Lai Or, Alice Chung Yan Chak, Bobby Chung Kin Yu, Halsten Chiu Hung Sze, Eva Ho Ying Chau, Carlos Ka Cheong Se-To, Dicky Tsz Wang Wong, Felix Wai Kit Heung, Eureka Kin Kwan Fung, Wai Chiu Ng

## Calendar of Events

**September 19, 2009**

**2009 Student Outreach Day**

**Time:** 8:30 a.m. - 5:30 p.m.

**Venue:** HKUST Campus

**SENG Booth Location:** Academic Concourse

**Activities:** Project displays, hands-on demonstrations, lab tours, seminars, students and alumni sharing, etc

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](mailto:seng@ust.hk).

**Stay connected and keep in touch!**

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