

# INFOCUS



HKUST ENGINEERING

Newsletter No.21 Spring 2012

The School of Engineering  
success story strides forward

# MOVING TO THE NEXT LEVEL



While looking forward to exciting times in 2012, it is also a great joy to look back over what has already been accomplished by the School in recent years. From the establishment of our forward-looking Center for Engineering Education Innovation (E<sup>2</sup>I) to ground-breaking research and applications to improve people's way of life, members of the School can be rightly proud of how they have been raising the bar across the engineering spectrum.

As we continue to boost our profile, the School has enjoyed dramatic increases in applications for our programs. Consistently ranked one of the best engineering schools globally, we are delighted to be drawing top-quality candidates from Hong Kong, Mainland China, Asia and other regions. This is putting us on track for further success as a multicultural hub of engineering excellence.

### 334 buzz

At the undergraduate level, the way ahead will be underpinned by our specially created curriculum, which maximizes the opportunities provided by Hong Kong's move to a four-year degree system in the autumn. No doubt there will be challenges to overcome as we implement what we have designed. But there is already a buzz of anticipation in the air here.

We believe our "Engineering PLUS" concept will provide a holistic, whole-person educational experience for our students and produce 21st century engineers who will inspire, innovate, and be ready to take on the major issues of our time: the environment, megacities, energy, healthcare. "Signature" courses, such as Engineering Innovation and Entrepreneurship, and Engineering Solutions to Grand Challenges of the 21st Century, signal the fundamental qualities we seek to develop in our graduates.

### Integrating the big picture

Through our new Global and Community Engagement Program, students can take part in projects and international competitions that will provide hands-on experience of teamwork and leadership issues as well as create links with global peers and different organizations to broaden their social awareness.

Likewise, our Internship and Industry Engagement Program will give greater practical insight into the work of an engineer. With the focus on mutually beneficial projects, we hope to involve companies in Hong Kong, the Pearl River Delta, and beyond, and to see

50% of our students take part in the initiative. The launch of the School's annual HKUST Technology Industry Innovation Award, which recognizes an outstanding technology leader with international impact, is also set to foster dialogue with leading industries.

### Research and postgraduate excellence

Our own innovative endeavors and world-class faculty continue to attract strong research funding support and draw top-tier postgraduate students, who hail from China and Asia, Europe, North America, the Middle East and Africa.

In support of our postgraduates' achievements, we inaugurated the School of Engineering PhD Research Excellence Award in 2011. In the year ahead, we will be boosting their professional and career development by developing workshops in instructional and communication skills, ethics, and public speaking, among others.

### Striding forward

Thus, 2012 is set to be a year of positive development at all levels, continuing the forward momentum of the past and bringing to fruition the careful restructuring and pioneering plans to enable us to make an even greater impact in the future. Whether a current member of the School, an interested student, or a potential academic or industry partner, I look forward to sharing successful times with you.

**Prof Khaled Ben Letaief**  
*Dean of Engineering*





## Administrative

### ■ Prof Christopher Chao

Appointed Associate Dean of Engineering  
(Research & Graduate Studies)  
Professor, Mechanical Engineering



### ■ Prof Hong Kam Lo

Appointed Associate Dean of Engineering  
(Undergraduate Studies)  
Professor, Civil and Environmental  
Engineering



## Faculty Members

### ■ Prof Francesco Ciucci

Assistant Professor, Jointly by Mechanical Engineering and  
Chemical & Biomolecular Engineering  
PhD - California Institute of Technology

### ■ Prof Ilias Dimitrakopoulos

Assistant Professor, Civil and Environmental Engineering  
PhD - Aristotle University of Thessaloniki

### ■ Prof Renqiang Min

Assistant Professor, Computer Science and Engineering  
PhD - University of Toronto

### ■ Prof Tze Ling Ng

Assistant Professor, Civil and Environmental Engineering  
PhD - University of Illinois at Urbana-Champaign

### ■ Prof Xiaowei Zhang

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

## Visiting Faculty

### ■ Prof Ben Chan

Assistant Professor, Civil and Environmental Engineering  
PhD - The Hong Kong University of Science and Technology

### ■ Prof Kwang Ting Cheng

Professor, Electronic and Computer Engineering  
PhD - University of California, Berkeley

### ■ Prof Stavros Papadopoulos

Assistant Professor, Computer Science and Engineering  
PhD - The Hong Kong University of Science and Technology

### ■ Prof Xiang Wan

Assistant Professor, Electronic and Computer Engineering  
PhD - University of Alberta

### ■ Prof Mingxiang Wang

Professor, Electronic and Computer Engineering  
PhD - Nanjing University

### ■ Prof Zhao Yin Wang

Professor, Civil and Environmental Engineering  
PhD - China Institute of Water Resources and Hydropower  
Research

### ■ Prof Chengshan Xiao

Professor, Jointly by Electronic & Computer Engineering and  
Computer Science & Engineering  
PhD - The University of Sydney

### ■ Prof Yitshak Zohar

Professor, Jointly by Mechanical Engineering and Electronic &  
Computer Engineering  
PhD - University of Southern California

## Worldwide Recognition - Fellows

### Institute of Electrical and Electronics Engineers (IEEE)

#### ■ Prof Oscar Au

Electronic and Computer Engineering

#### ■ Prof Roger Cheng

Electronic and Computer Engineering

#### ■ Prof Vincent Lau

Electronic and Computer Engineering

#### ■ Prof Johnny Sin

Electronic and Computer Engineering

#### ■ Prof Danny Tsang

Electronic and Computer Engineering

#### ■ Prof Qian Zhang

Computer Science and Engineering

### American Society of Mechanical Engineers (ASME)

### International Society of Indoor Air Quality and Climate (ISIAQ)

#### ■ Prof Christopher Chao

Mechanical Engineering

### International Water Association (IWA)

#### ■ Prof Guanghao Chen

Civil and Environmental Engineering

### Society of Plastics Engineers (SPE)

#### ■ Prof Furong Gao

Chemical and Biomolecular Engineering

### International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM)

#### ■ Prof Christopher Leung

Civil and Environmental Engineering

### The Association for Computational Linguistics (ACL)

#### ■ Prof Dekai Wu

Computer Science and Engineering

# Mechanical Engineering Professors Elected to Chinese Academy of Sciences

Two professors from the Department of Mechanical Engineering joined the ranks of the nation's best scientific minds in December 2011, when they were elected to the prestigious members of the Chinese Academy of Sciences.

Prof Tongyi Zhang, Chair Professor, and Prof Ping Cheng, Professor Emeritus, were among three Hong Kong academics honored for their outstanding scientific achievements. The third was Prof Mingjie Zhang, Chair Professor in the Division of Life Science at HKUST. Membership of the Chinese Academy of Sciences is the highest academic title conferred by the Chinese government for achievements in science and technology research.

HKUST President Prof Tony F Chan said he was proud of the academic accolade bestowed on the University's faculty members. He also hoped it would lead to greater strides in Hong Kong-Mainland collaborations and assist science and technology development.

Prof Tongyi Zhang paid tribute to his own professors, and the dedication of colleagues and students. He thanked the University of Science and Technology Beijing, where he received his PhD, for giving him a quality education and HKUST for providing a world-class work environment.

Prof Zhang's primary research focus is on hydrogen embrittlement, fracture and failure of multi-field coupling materials and micro/nanomechanics. He has published over 160 SCI papers and co-holds two US patents. He is a two-time recipient of the State Natural Science Awards, Second Class, and has received the Senior Research Fellow Award from the Croucher Foundation in Hong Kong, the Fellow Award from the ASM International in US, and the National Award for Young Scientists from the China Association for Science and Technology. He joined HKUST in 1993 and was later promoted to Chair Professor. Prior to HKUST, he had undertaken research at the

University of Göttingen, University of Rochester, and Yale University.

Active and highly respected in the international community, Prof Zhang was nominated to be Executive Officer of the International Congress on Fracture in 2009, and invited to deliver plenary lectures at the 12th International Conference on Fracture and the 18th European Conference on Fracture.

Prof Ping Cheng is a world-renowned researcher in the field of heat transfer. He has published over 180 SCI papers in porous-media heat transfer, radiative heat transfer and microscale heat transfer with an h-index of 39. He was elected a Fellow of the American Society of Mechanical Engineers (ASME) in 1986 and a Fellow of the American Institute of Aeronautics and Astronautics (AIAA) in 2004.

A long-time academic top achiever, Prof Cheng has won many awards during his career, including the 2006 ASME/AIChE Max-Jakob Memorial Award, considered the highest international honor in the field of heat transfer. He has also received the Shanghai Science and Technology Award, First Class, and State Natural Science Award, Second Class.

Prof Cheng, who undertook his PhD in Aeronautics and Astronautics at Stanford University, acknowledged the support he had received from HKUST when he was Head of the Department of Mechanical Engineering (1995-2002). He became Professor Emeritus in 2003 and is currently Chair Professor of Mechanical Engineering and Director of Center for Microfluidics and Thermal Control at Shanghai Jiao Tong University.



## Sewage Treatment Goes Green



Novel technology that successfully minimizes the adverse environmental impact of sewage treatment plants has been invented by a research team led by Prof Guanghao Chen, Civil and Environmental Engineering.

Prof Chen said the Sulphate Reduction, Autotrophic Denitrification and Nitrification Integrated (SANI) Process eliminates 90% of sewage sludge production, minimizing energy consumption as well as odor and greenhouse-gas emissions. It also reduces sewage treatment costs and space requirements by 50%.

The SANI Process, which uses sulphate reduction bacteria integrated with Hong Kong's seawater toilet flushing system, has been recognized by the International Water Association (IWA) as one of the most successful water management systems around the world. In recognition of Prof Chen's remarkable research achievements, he was recently elected a Fellow of the IWA, becoming the first Hong Kong scholar to receive this prestigious honor.

The research project started in 2004, followed by pilot testing at Tung Chung Sewage Pumping Station for two years. The technology has now passed the medium-scale test at the capacity of 10 tonnes of sewage per day.

Partnering Prof Chen's team are Delft University of Technology in the Netherlands and the University of Cape Town in South Africa, in collaboration with Hong Kong Airport Authority, the Water Supplies Department and the Drainage Services Department.

Ir Lee Tak Ma, Director of Water Supplies, said: "The SANI Process perfectly integrates the freshwater system and seawater system. This innovative sewage treatment technology maps out an excellent plan for developing the seawater toilet flushing system, as well as the reuse and recycling of saline sewage."

The technology has also drawn the attention of the UNESCO-IHE Institute of Water Education which has found it an effective and sustainable water resource.

## Industries Welcome Wi-Fi Data Access Solution

A multi-hop wireless mesh network researched and developed by Prof Gary Chan, Computer Science and Engineering, and his team has greatly improved Wi-Fi data access performance. The work has been successfully commercialized, leaping from his research lab to industrial deployment. It is able to overcome Wi-Fi coverage and throughput problems in the most challenging network environments such as container terminals, airports, indoor complexes and cities.

The software the team developed, LAviNet, implements innovative channel selection and routing algorithms. These algorithms effectively eliminate dynamic and complex blind spots, avoid traffic congestion and reduce signal interference. After much testing and improvement through rigorous research and development cycles, the technology was successfully transferred to industry, where it has been well received by end users.

To date, Wi-Fi networks have suffered from limited coverage, high interference and costly set-up. By forming a cost-effective multi-hop network, LAviNet dramatically improves the networks overcoming these problems. Actual measurements have shown signal strength enhancement of 100 times or more, with a many-fold reduction in cost. LAviNet can be easily installed in most wireless routers to enable its features. These intelligent routers may be put anywhere without replacing the existing Wi-Fi access points.

Research and development on LAviNet started in 2007. According to Prof Chan, most commercial Wi-Fi solutions have been based on installing fixed access points. "In environments with obstacles and dynamic blind spots, such fixed access points no longer work well." Comprising more than 20 researchers, postgraduates and undergraduates, his team has conducted research and development on the innovative solution. "We developed LAviNet with the research goal of maximizing user Wi-Fi experience. With continual feedback from deployment experiments, our research has successfully addressed wireless access challenges with direct impact on industry and users," he said.

Project sponsors included Hong Kong Innovation and Technology Commission (ITC), Boeing Company, Hong Kong Aircraft Engineering Company (HAECO), Modern Terminals Limited, OpenPlatform Technology, Ruckus Wireless and Altai Technologies Ltd.



## Helping to **Lead the Way**

The second half of 2011 saw the publication of a series of rankings indicating the notable global recognition achieved by the School of Engineering.

In October, the *Times Higher Education (THE)* World University Rankings in Engineering and Technology, ranked HKUST first in Greater China and 28th worldwide. The rankings are based on teaching, research, citations, industry income and international outlook.

In September, HKUST hit the No. 1 spot in Hong Kong and No. 22 globally in Engineering and Technology in the QS World University Rankings 2011. Ranking indicators included academic reputation, employer reputation, citations per faculty, faculty student ratio, proportion of international students and proportion of international faculty.

A month earlier, HKUST was again ranked No. 1 in Hong Kong in Engineering/Technology and Computer

**No. 1** in Greater China  
#28 GLOBALLY  
IN ENGINEERING AND TECHNOLOGY  
THE WORLD UNIVERSITY RANKINGS 2011

**No. 1** in Hong Kong  
# 22 GLOBALLY  
IN ENGINEERING AND TECHNOLOGY  
QS WORLD UNIVERSITY RANKINGS 2011

Sciences by Shanghai Jiao Tong University's Academic Ranking of World Universities (ARWU) 2011. The University has held this position since the ARWU engineering field ranking was first published in 2007. HKUST was positioned 36th in engineering globally. Ranking indicators include alumni and staff winning Nobel Prizes and Fields Medals, highly cited researchers, articles indexed in Science Citation Index-Expanded (SCIE) and Social Science Citation Index (SSCI), percentage of articles published in the

top 20% of journals of each field, and engineering research expenditure.

Separately, ARWU ranked HKUST at No. 1 in Greater China in Computer Science for the second consecutive year. The University was placed 21st worldwide.

Dean of Engineering Prof Khaled Ben Letaief said HKUST's consistently top ranked position in the world in engineering was due to the distinction of the University's faculty and students. "We shall continue to work hard to further develop HKUST as a global center of excellence in research and education which welcomes talented faculty and students from around the world," he said.

## Winning Approach to **Teaching**

Prof Amine Bermak, Electronic and Computer Engineering, has won the prestigious Michael G Gale Medal for Distinguished Teaching. The honor was established by the University Council in 1994 to recognize teaching excellence and the ability to inspire and motivate others. It is awarded annually to one outstanding faculty member from across all Schools at HKUST.

Since joining the University in 2002, Prof Bermak has shown great enthusiasm for his work and commitment to his students, providing them with a solid theoretical foundation linked to practical engineering applications. He has an open-door policy to encourage students to discuss academic issues and learning difficulties outside the classroom. He is also a popular and effective postgraduate supervisor, with one of the heaviest supervision loads in the University.

Prof Bermak has actively promoted computer engineering to local secondary schools. In addition, he has greatly assisted student job placement and internships through his interaction with industry.

He is a two-time recipient of the School of Engineering Teaching Excellence Award and a four-time nominee for the Michael G Gale Medal.





# Always Reaching Higher

Prof Christopher Chao enjoys pushing himself to greater levels of achievement, even if it means leaving his comfort zone and taking on fresh challenges to get there. He is thus full of anticipation about his new role as Associate Dean (Research & Graduate Studies). Not only will the former associate head and acting head of the Mechanical Engineering Department be driving the School forward in its postgraduate education, he will also be boosting fresh approaches to cutting-edge research that can contribute to solving major issues of our time.

The School of Engineering already has a highly ranked global reputation for its research productivity and outcomes, and draws top students, many from Mainland China, through the cutting-edge nature of its faculty team. However, the School is not content to stand still.

Prof Chao notes that these days whether postgraduates go into academia or industry – and many also take the latter path – they need communication and interpersonal skills as well as brilliance to win funding or engage support for a project. “In the old days, postgraduates would only say how difficult their research was and that nobody would understand it. Now they really should be able to tell people what they are doing. They need to be clear and concise; to persuade through discussion; understand what colleagues in other fields are doing and why.”

Such attributes are set to be developed through presentation workshops and forums where students learn to explain their work to people outside their specialty as well as fun activities such as group expeditions and gatherings to strengthen social skills and widen perspectives. “We want to make it possible for our students to pursue their dreams, whether as researchers, lecturers or industry leaders,” said Prof Chao. “And to build up peer support networks that can spark lifetime friendships and working partnerships.”

Internationalization is an essential element of this to boost cross-cultural awareness and ties. The School’s success in attracting high-flying doctoral candidates on the prestigious Hong Kong PhD Fellowship Scheme has already brought in students from different continents. Now the goal is to increase the international numbers overall. Prof Chao and his team recently visited over 20 universities in Eastern and Western Europe, the Middle East, and Asia, finding great interest in collaboration.

Strengthening mainland ties is also a focus, with joint postgraduate programs being explored and three-way partnerships between HKUST, a mainland institution and an international university due to be considered later. The HKUST Fok Ying Tung Graduate School in Nansha and IER in Shenzhen also offer further openings for top engineering research collaboration and entry into Mainland China. “Together with the University’s Entrepreneurship Center to turn innovative research into an enterprise and the pioneering Center for Engineering Education Innovation providing additional mentorship, the School’s postgraduates will have the skills, research opportunities, networks and support to develop themselves into leaders of the future in whichever path they decide to take.”

On the research front, Prof Chao is set to encourage faculty members to engage in theme-based studies involving large-scale multi-disciplinary projects as well as excel at the individual level. Significant areas that beckon include energy, bioengineering, and smart green buildings.

He believes there is exciting potential for major contributions to be made given the world-class talents that comprise the School. “It is the same as when I took this position,” he said. “You jump to new areas and rise to the challenge. Those at SENG are risk-takers by nature which is why they are able to achieve so much.”



## Developing 21st Century Engineers

A guiding hand is how Prof Hong K Lo looks at his role as the new Associate Dean (Undergraduate Studies). The civil engineering expert certainly knows the value of this, having benefited himself from a transformative experience with a challenging yet supportive advisor during his graduate studies.

Mentoring and advising are among the areas being strongly developed across the School as the once-in-a-lifetime chance to reshape the undergraduate experience unfolds with the introduction of the four-year degree program this autumn. "The flexibility and student-centered approach built into the innovative curriculum will allow learners to direct their studies much more in terms of the courses they undertake," Prof Lo said. "So they will need good advice."

He sees explaining what engineering is to high school students as another important aspect of his role, as many are still unclear how to relate their school subjects to the work of an engineer. When Prof Lo was at school, he enjoyed both physics and math. He could have headed into medicine or science, but knew his real calling was to build structures as a civil engineer. "What fascinated me was to be able to put something on the map that would remain after I was gone. With engineering, I could put my love of the sciences to work on projects where my children could say: 'This is my father's work.'"

There are several key pillars working in synergy with the revamped curriculum to make the SENG undergraduate experience special, he feels. The launch of the Center for Engineering Education Innovation will keep the School at the forefront of engineering education. Training on professional development and company matching will enrich student internships and strengthen ties with industry. Community projects with NGOs and overseas competitions will enable students to put their skills and enterprise into action. In addition, the School's international exchange program is expanding, with the aim of offering 50% of undergraduates the opportunity to study outside Hong Kong.

"These developments have been made possible because the whole School has been involved in redesigning its approach from the ground up and been willing to allocate the resources for them. We want to open students' minds and give them a chance to take a broader look at life when they are with us."

Prof Lo is keen to see more women take up engineering and, with greater understanding of what the profession now entails, he thinks this will happen. "Women engineers bring new perspectives to a team. Companies appreciate that too." He also stresses that students of engineering not only become engineers but go into business, government and many other careers.

"You may end up as managing director of a major company but you will know from your engineering training how to look at cost-effectiveness, appreciate both theory and practical applications, take sustainability into consideration. An engineering degree provides a very solid and useful foundation as a professional, regardless of where you work."

When SENG students graduate, Prof Lo would like them to be confident of their capabilities, have a flexible mindset and a passion for their work. "When students in Hong Kong join a program, they are often already thinking about which makes the most money, which may not be the most appropriate way to think of their career. We feel it would be better for them to find what they really enjoy and thus do it well. This is where guidance and support can really make a difference."





# Engineers of the Future Go Into Action

Whether competing in competitions overseas or helping to develop practical applications for people in need locally, students in the School of Engineering are set to gain more opportunities to strengthen leadership skills and social awareness with the launch of the innovative co-curriculum Global and Community Engagement (GCE) Program.

The School has already been successful in sending teams to take part in international robotics contests, and drawing students into community-oriented courses. The Global and Community Engagement Program will create additional space to strengthen students' participation in such activities, conferences and professional events.

"The program provides a platform for students to step outside the campus environment and put the knowledge they are gaining to work," said Prof Tim Woo, Electronic and Computer Engineering, who is the GCE Founding Director.

Prof Woo has been playing a leading role in supporting undergraduate students in external project competitions. He collected the SENG Teaching Excellence Appreciation Award in 2009-10. "The benefits of such a program are tremendous," he said. "Students can gain confidence and new perspectives. They can also see for themselves how their work as engineers can really make an impact on people's lives."



## Robotics Leads the Way

The HKUST Robotics Team, comprising 70 undergraduates from SENG's six departments, is a major example of the School's high-flying participation in international competitions. Recent achievements include:

### Robocon Team

- Best Idea Award and Mabuchi Motor Award, 2011 ABU Asia-Pacific Robot Contest in Bangkok. A total of 17 regional champions and 2 best teams from the host country took part in this international contest.
- Champion at the Robocon 2011 Hong Kong Contest, an inter-institutional contest with six local higher education institutions participating.
- Third Class Award, 12th Challenge Cup in China, a national technology contest.

### ROV Team

- Design Elegance Award, 2011 International Student Remotely Operated Vehicle Competition for underwater robots, held at NASA Neutral Buoyancy Laboratory in Houston, US. 26 teams from 7 countries/regions participated.
- First Class Award, 12th Challenge Cup in China. Some 1,000 student teams competed, with just 8% gaining a First Class Award.
- Merit Award, 11th Asia Pacific ICT Awards.

### Smart Car Teams

- Third Class Award and Merit Award in the Freescale Smart Car Competition (South China Region), one award each for two HKUST teams. Held in Changsha, Hunan. Over 100 teams took part.



Photo Credit: Radio Television Hong Kong



Photo Credit: Innovation and Technology Commission

## Faculty Honors, Awards & Achievements

- Dean of Engineering Prof Khaled Ben Letaief has won the 2011 IEEE Communications Society Harold Sobol Award for Exemplary Service to Meetings and Conferences. The award is given to a member who has demonstrated exemplary service over a sustained period of time. It is open to members around the world and only one person is chosen to receive the honor each year.



- Prof Shing Chi Cheung, Computer Science and Engineering, together with a group of researchers from Nanjing University received a second prize in the National Awards for Science and Technology Progress 2011. Their project focused on "Software Technology, Platforms, and Applications for Internetware".

- Prof Lambros Katafygiotis, Civil and Environmental Engineering, has been awarded the Senior Research Prize by the European Association for Structural Dynamics. Senior and Junior Research Prizes are presented every three years to recognize outstanding contributions in various fields of structural dynamics (one prize for methodology development, and one for computation or application). Prof Katafygiotis received his accolade in the area of computational methods in structural dynamics with the following citation: "For his many pioneering seminal contributions in Computational Stochastic Dynamics and Systems Identification". The award was delivered at the 8th International Conference on Structural Dynamics (EURODYN 2011), Leuven, Belgium, July 4-6, 2011.



- Prof Hoi Sing Kwok, Electronic and Computer Engineering, received the Best Presentation Award at the Optics of Liquid Crystals (OLC) 2011 Conference in Yerevan, Armenia. OLC conferences provide opportunities for scientists and engineers in the field to discuss recent results, meet other experts, and review current research trends.

- "Transforming Hong Kong's Ocean Container Transport Logistics Network", a study led by Prof Chung-Yee Lee, Industrial Engineering and Logistics Management, was one of only six projects out of 89 proposals to be supported in the first round of the Research Grants Council's Theme-based Research Scheme. The project received funding of HK\$13,292,000. The research team will holistically study ocean container transport supply chain networks around the world at strategic and tactical levels. The team will also develop decision support systems for Hong Kong's ocean container supply chain network.



- It has been a rewarding time for Prof Ricky Lee, Mechanical Engineering, and his research team who have collected several honors recently. Post-doctoral Fellow Dr Fubin Song, PhD candidate Chaoran Yang and Prof Lee won the Best Paper Award at the SMTA China South Technology Conference for their paper "Effect of Pad Design and PCB Materials on the Pad Cratering Failure". Prof Lee, Dr Song, and their industrial collaborators also received the Best International Conference Paper Award from IPC APEX2011 Expo, the largest international conference dedicated to surface mount technologies. In addition, Prof Lee has been elected President of IEEE Components, Packaging and Manufacturing Technology (CPMT) Society. The world-renowned flagship technical society has a membership of more than 3,000 high-caliber professionals worldwide. Prof Lee is the first one based in Asia to be elected to this global leadership position.

- Prof Bo Li and Prof Long Quan, Computer Science and Engineering, have been awarded grants in the National Natural Science Foundation of China/Research Grants Council Joint Research Scheme Competition 2011. Prof Li's project involves "The Minimized Energy Consumptions and Maximized Resource Utilizations in Large-scale Datacenters" while Prof Quan's study looks at "Theory and Practice of Large-scale 3D Urban Reconstruction and Modeling".



- Prof Richard So, Industrial Engineering and Logistics Management, has become a scientific editor for *Applied Ergonomics* and an editor for *Ergonomics*, both among the top journals in the field.

- Prof Matthew Yuen, Mechanical Engineering, and his research group have won the Philips Best Paper Award at the 2011 International Conference on Electronic Packaging Technology and High Density Packaging. The paper was entitled "Novel Cooling Solutions for LED Solid State Lighting".



## Teaching Excellence

### SENG Honors **Top Lecturers**

Two talent lecturers have received the School of Engineering Teaching Excellence Appreciation Award 2010-11, with the Distinguished Teaching Award going to Prof Henry Lam, Chemical and Biomolecular Engineering, and the Teaching Award to Prof Ning Cai, Industrial Engineering and Logistics Management.

Prof Lam has received excellent undergraduate instructor evaluations and has been keen to share his approach to teaching with other lecturers. Expertise in his field, good organization, and clear explanations of concepts have all contributed to his effectiveness as a teacher.

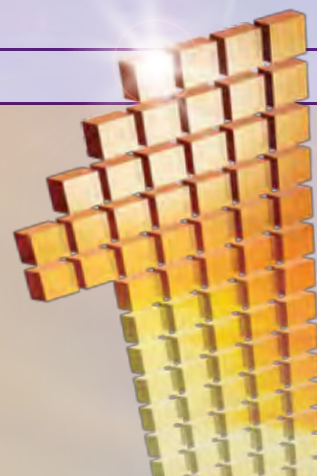
Prof Cai has made tremendous efforts to provide classes that engage and stimulate critical thinking. He actively seeks feedback from students and takes account of such comments to further develop the content of his programs.





# Jolly Good Fellows

The expertise and significant global contributions of School of Engineering faculty members are being recognized by the world's leading professional institutes



## INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

Celebrations were certainly in order in December when six School of Engineering professors were elected 2012 Fellows of the Institute of Electrical and Electronics Engineers (IEEE). HKUST had the highest number of newly elevated IEEE Fellows among universities and institutions in Asia, bringing the total number of IEEE Fellows at the University to 25. The University gained more new IEEE Fellows than countries such as Korea, Singapore and Australia.

The IEEE is the world's leading professional association for advancing technology for humanity, with 395,000 members in more than 160 countries. Fellowship is the highest grade of membership and is a distinction reserved for select members with outstanding accomplishments. The number of Fellows chosen in any one year is limited to 0.1% of the total voting membership.

The association is a leading authority on areas ranging from aerospace systems, computers and telecommunications to biomedical engineering, electric power and consumer electronics. Of the total Fellows at HKUST, 18 are from the Department of Electronic and Computer Engineering, six from the Department of Computer Science and Engineering, and one from the Department of Mechanical Engineering.

**Prof Oscar Au**, *Electronic and Computer Engineering, Director of Multimedia Technology Research Center*



Cited for contributions to multimedia coding and security. Prof Au's fast motion estimation algorithms have been accepted into the ISO/IEC 14496-7 MPEG-4 international video coding standard and the China AVS-M standard, and he holds eight US patents on his signal processing techniques.

**Prof Roger Cheng**, *Electronic and Computer Engineering, Associate Dean of Engineering (Undergraduate Studies)*



Elected for work on multiuser communications in wireless systems. Prof Cheng's research interests extend across multiuser information theory, code division multiple access (CDMA) technology, and OFDM and OFDMA technology. He has 19 patents and patent applications.

**Prof Vincent Lau**, *Electronic and Computer Engineering, Founder and Co-director of Huawei-HKUST Innovation Laboratory*



Recognized for contributions to wireless communication systems with channel feedback. He holds 28 US patents on various advanced wireless technologies and is the key contributor for four IEEE 802.22 (cognitive radio) specifications.

**Prof Johnny Sin**, *Electronic and Computer Engineering, Director of the Nanoelectronics Fabrication Facility, Director of the Semiconductor Product Analysis and Design Enhancement Center*



Cited for his work on the design and commercialization of power semiconductor devices. Prof Sin's design has been widely used in home appliances, portable electronics, mobiles and automotive equipment. He is the holder of 12 patents.

**Prof Danny Tsang**, *Electronic and Computer Engineering, Associate Director of NIE Social Media Lab*



Recognized for research on the optimization of communications networks. Prof Tsang invented the 64B/65B encoding now adopted by the International Telecommunication Union (ITU)'s Generic Framing Procedure recommendation GFP-T (ITU-T G.7041/Y.1303). He has been awarded three US patents and one Chinese patent.

**Prof Qian Zhang**, *Computer Science and Engineering, Founder and Co-director of Huawei-HKUST Innovation Laboratory, Director of Digital Life Research Center*



Honored for her contributions to the mobility and spectrum management of wireless networks and mobile communications. Prof Zhang is the inventor of about 30 international patents. In December, she also received the Chinese Young Scientists Award from the China Association for Science and Technology.

## Globally Renowned Across Engineering

In addition to IEEE, the members of several other prestigious international organizations have acknowledged the tremendous input of School of Engineering faculty members to their respective fields by selecting them as Fellows.

### AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

### INTERNATIONAL SOCIETY OF INDOOR AIR QUALITY AND CLIMATE (ISIAQ)

**Prof Christopher Chao**, *Mechanical Engineering, Associate Dean of Engineering (Research & Graduate Studies), Director of the Building Energy Research Center, Associate Director of the Center for Sustainable Energy Technology*



Prof Chao has been elected an ASME Fellow, a top honor in the mechanical engineering field. Nominated by their peers, ASME Fellows are recognized for their outstanding engineering achievements and have had 10 or more years of active practice and continuous membership. ASME has over 120,000 members in over 150 countries but only 3,000-plus members have attained the grade of Fellow. In addition, Prof Chao has also been elected to ISIAQ's Academy of Fellows, the most prestigious international recognition in the field of indoor air quality studies. Election to the Academy is based on contributions to the field via outstanding research and/or technological development. His research areas include energy, thermofluids, and indoor air science.

### INTERNATIONAL WATER ASSOCIATION (IWA)

**Prof Guanghao Chen**, *Civil and Environmental Engineering*



In being elected to IWA Fellowship, Prof Chen becomes a member of an elite group of global water professionals renowned for their guidance and leadership in the world of water science, technology and management. His research interests include sustainable sewage treatment systems; sludge minimization in bio-treatment; sewer process modeling; MBR process optimization; low-cost and compact wastewater treatment technology. Prof Chen is the first Hong Kong scholar to receive this prestigious honor. The IWA has a global network of 10,000 water professionals.

### SOCIETY OF PLASTICS ENGINEERS (SPE)

**Prof Furong Gao**, *Chemical and Biomolecular Engineering, Director of Center for Polymer Processing and Systems*



Prof Gao was recognized for his studies and discoveries related to injection molding machine control. His research interests span process modeling, control and monitoring; polymer processing; applications of neural networks, fuzzy systems and expert systems. He is the first to be accorded this honor in Mainland China and Hong Kong.

### INTERNATIONAL UNION OF LABORATORIES AND EXPERTS IN CONSTRUCTION MATERIALS, SYSTEMS AND STRUCTURES (RILEM)

**Prof Christopher Leung**, *Department Head, Civil and Environmental Engineering*



Prof Leung is the first from an institution in Greater China to be named a RILEM Fellow. The organization is a leading international association for the advancement of construction materials and their application in structures. Since the Fellow grade was inaugurated in 1994, only 51 have been elected. Prof Leung's research interests focus on construction materials, micromechanics of fiber composites, fracture mechanics, optical fiber sensors, and the application of composites in civil engineering.

### THE ASSOCIATION FOR COMPUTATIONAL LINGUISTICS (ACL)

**Prof Dekai Wu**, *Computer Science and Engineering, Human Language Technology Center*



Named among the first 17 Founding Fellows of the prestigious ACL, Prof Wu was cited for his significant contribution to machine translation and inversion transduction grammar. Prof Wu pioneered machines that learn by themselves to translate between Chinese and English, as well as the world's first public web translation service in 1995 at HKUST, a forerunner of Google Translate and Yahoo's Babelfish. A top global researcher in the artificial intelligence and cognitive science fields of natural language processing, language engineering, and human language technology, he is one of the only two ACL Founding Fellows from Asia and the only one from Greater China.



# Looking Forward, **Looking Back**

## Seeing the Impact of **Innovation**

The eye-opening *Bring Technology to Community* exhibition, organized by the School of Engineering, took members of the public into world of innovation at the Hong Kong Science Museum in October. The week-long display highlighted the work and research achievements of the School's faculty, students and alumni and raised awareness of how technology impacts people's daily lives.

An underwater robot, a mini smart car, a digital photo frame that offers cognitive therapy to postpone the deterioration of Alzheimer's sufferers, an environmentally friendly, cost-effective Braille Embosser, and a 150-billion pixel digital photo, with RadarTOUCH technology powered by Leovation, were among the technologies on show.

Separately, the Hong Kong Science Museum has accepted the Torsional Wave Demonstrator, a final year project by 2010 Mechanical Engineering graduates, as one of its exhibits. The machine makes the propagation of torsional vibration visible to the naked eye. It can also demonstrate a variety of wave forms including reflection waves and standing waves.



## **Ecotronics Forum** Makes Its Debut at HKUST



The First International Ecotronics Symposium – Electronics for Energy and the Environment was successfully held at HKUST on November 12, sponsored by the School of Engineering and Department of Electronic and Computer Engineering.

Over the past decade, many research efforts have explored a broad range of applications and technologies for generating energy and protecting the environment. These include solar cells, wind turbine engines, solid-state lighting, green buildings, smart grid and environmental pollution sensors, among others. The symposium provided a highly useful forum, bringing together industry visionaries to discuss emerging trends in energy applications and implications for research and development.

Other participating organizations were the Hong Kong Applied Science and Technology Research Institute (ASTRI); BMTPow Ltd; Du Pont Apollo Ltd; Hongkong Electric Co. Ltd; and the University of California, Santa Barbara.

## **Night to Remember** for Mechanical Engineering Alumni

The Department of Mechanical Engineering held a 20th Anniversary Dinner on November 26, enabling more than 200 alumni, family and friends to enjoy a memorable and happy evening together.

The occasion got underway with a speech by Prof Matthew Yuen, Head of the Department. Founding and retired Department Heads and faculty members, including Prof Pin Tong, Prof Ping Cheng, Prof TX Yu,

Prof CT Hsu, and Prof SC Kot, were then invited to join the toast in celebration of the Department's achievements and success in the past 20 years.

Four Distinguished Alumni Awards were also presented in recognition of outstanding service to the Department and professional academic and/or industrial achievements. The awardees, who received all their qualifications from the Department, were: Dr Terry Ka Kit Chang, (1996 BEng, 1999 MPhil, 2003 PhD); Dr Jeffery Chi Chuen Lo, (2002 BEng, 2004 MPhil, 2008 PhD); Rosie Ming Sum Ma, (2001 BEng, 2003 MSc); and Dr Weihua Xu, (2004 PhD).

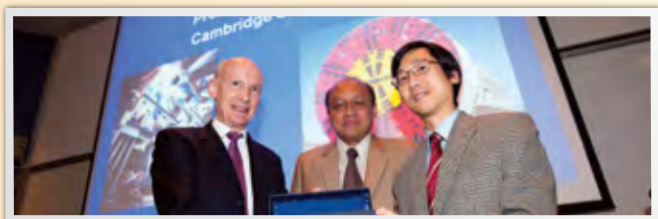




Throughout 2011, the School of Engineering arranged and took part in a wide range of events to celebrate HKUST's 20th Anniversary. The following highlight the most recent activities in the line-up



## Going Underground to Get Around in Megacities



As urban congestion grows around the world, underground transportation looks set to become an increasingly important feature of our burgeoning cities. The fresh challenges this will bring for geotechnical engineers and some of the latest underground construction techniques in the field were explored in a HKUST Institute for Advanced Study (IAS) Distinguished Lecture in November, given by Prof Robert Mair, Sir Kirby Laing Professor of Civil Engineering and Head of Civil and Environmental Engineering at Cambridge University. The lecture was co-organized by the School of Engineering and the Department of Civil and Environmental Engineering.

In his talk, "Advances in Research and Practice in Underground Construction – The Future of Megacities", Prof Mair looked at the need for protection from subsidence, new ways to evaluate how

buildings may be affected by tunneling and deep excavations, and novel techniques for monitoring construction using fiber-optic technology and wireless sensor networks. He also provided examples of current and future projects from around the world.

Prior to the IAS lecture, Prof Mair also delivered a seminar on "Tunneling and Deep Excavations – Ground Movements and Their Effects" to research students and faculty members of HKUST. Both the IAS lecture and the seminar were chaired by Prof Charles Ng, Chair Professor of Civil and Environmental Engineering.

Prof Mair is one of the Founding Directors of the Geotechnical Consulting Group, which is based in London and Hong Kong and was established in 1983. He has also been Senior Vice-President of the Royal Academy of Engineering and a Fellow of the Royal Society.



### Students

## My Life as a Princeton Research Intern

*In 2011, Cleve Ming Jin (BEng in Electronic Engineering – Honors Research Option) became one of the first students to participate in the School's reciprocal summer research internship program with Princeton University*

"During my two-month stay at Princeton, I was assigned to be a research assistant at the Imaging and Analysis Center, which I found both enriching and challenging. The Center provides high-end, state-of-the-art instrumentation to assist materials research and education and is one of the most advanced of its kind in the country. I worked on a project to characterize the electrical properties of nickel nanowires. To do so, I was trained to use complex, hi-tech equipment, including hands-on operation.

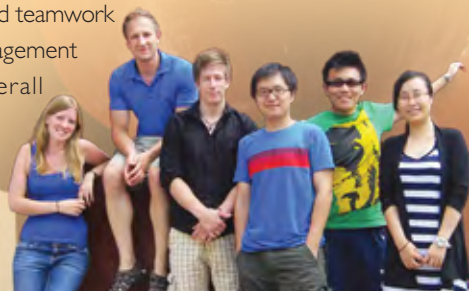
"My Princeton supervisors were friendly and supportive. During the day, I worked 9am-5pm on experiments in the lab. At night I read relevant materials and decided what to complete the following day. I reported my progress and plans in a weekly written report. In this way, I kept independent control of my project yet also received guidance on systematic research.

"As my final year project at HKUST is related to my work at

Princeton, I was able to get started very quickly when I came back.

"In addition to my research, I made many friends. My hosts were two Princeton students, who inspired me to try activities such as kayaking, which I had never done before. I valued the cross-cultural friendships which opened up my mind to see the world from new perspectives.

"My Princeton experience was a great complement to my previous exchange at University of Pennsylvania, where I mostly focused on coursework. Such a research internship is especially useful if you are thinking about postgraduate studies. I developed strong ties with my supervisors and it undoubtedly helped my communication and teamwork skills, project management abilities, and overall confidence."



## Leading Malaysian Students Choose SENG

The flourishing international appeal of the School of Engineering has seen two of Malaysia's top students become undergraduates this year.

The straight-A students are Jun Kang Chow, who is enrolled in the Civil and Environmental Engineering program and Wilson Wei King Lye who joined the Mechanical Engineering program. Only eight candidates out of more than 53,000 gained five A grades in Malaysia's pre-university STPM examination. Most candidates only take four subjects.

Jun Kang, whose father is also an engineer, is interested in sustainability, but environmental engineering is not popular in Malaysia. He appreciates the sense of freedom and insight he is gaining at the School and is keen to take advantage of the many different opportunities for all-round development.

For Wilson, engineering has always been a strong interest from the time he was small and keen on dismantling all his toys. While drawn to and good at physics, he enjoys the thinking processes that go into applications more, he said. He wants to do well in his studies at the School and may go on to postgraduate programs later.

Neither student had previously been to Hong Kong. Both are finding it fun to live in a new environment.



## Ambassadors Design Memorable Introduction to Engineering at HKUST Summer Institute



The enthusiasm of SENG students for their field saw two entertaining and inspiring Engineering Get2Gathers arranged for HKUST's first Summer Institute for Secondary School Students last July and August. The events gave summer school participants insight into the world of engineering and technology, and a chance to meet current undergraduates and alumni.

Organized by SENG Student Ambassadors and supported by the Engineering Students' Union and the School, the gatherings drew over 100 participants from 59 secondary schools.

As part of the program, students took part in interactive games specially designed to increase their understanding of engineering and the application of science and technology. Feedback showed the school students enjoyed the fun

atmosphere, were interested in the activities, and welcomed getting to know new friends. The first gathering proved so popular that participants continued to talk to each other, and SENG students, long after the event was due to end and many attended the second event as well.

The Engineering Get2Gathers also reflected the successful application of training received by the SENG Student Ambassadors, an elite program enabling students to represent the School and promote engineering to prospective students and the public. The ambassadors conceived, planned, produced the props and materials for games, and acted as MCs. There are over 20 student and head ambassadors in the current team. Recruitment for 2012-13 starts soon.

# BRIDGE

## to Awareness

Several civil and environmental engineering students have gained practical experience as well as insight into people's lives in remoter areas of Mainland China through taking part in Wu Zhi Qiao (Bridge to China) Charitable Foundation projects.

The Foundation, a Hong Kong registered charity, mobilizes university students, professionals and volunteers to realize sustainable projects in areas with urgent need for bridge-building. A project team is set up for each bridge – usually a joint undertaking between a Hong Kong and a mainland university – to oversee the work from initial survey to design and construction.



Brandon Cheng, Year 2, returned recently from Mixia, Yunnan, where he helped with the construction stage. This involved working with ARUP engineers and mentors from the University of Kunming as well as the physically demanding work of carrying heavy stones and steel. "While tiring, I felt it was worth it as our hard work would provide a safe bridge crossing for the villagers," he said.

The SENG participants have also enjoyed cooperating with fellow students from the mainland as well as learning more about village culture.

## Effective Leadership in Action

Hin San Hung, Year 3, Industrial Engineering and Logistics Management, has been presented with the Stephen Cheong Kam-chuen Medal for Distinguished Service to the Student Body. The medal is given annually to the HKUST student who best exemplifies caring, constructive leadership.

Hin San served as the Vice-President (Internal) of the Students' Union in 2010-11. He showed outstanding leadership over the issue of student society election campaigns and was proactive and effective in helping the union's executive members convey students' views on a wide range of campus issues, including student catering and amenities. He also worked out practical solutions that were mutually beneficial to students and the University community as a whole.

As a result of his dedication and commitment, greater cohesiveness has been brought to different branches of student activity. In addition, Hin San was active in organizing fund-raising activities with different groups on behalf of off-campus causes, in particular the campaign to help victims of the March 2011 earthquake in Japan.

The medal was established by the University Council in 1993 in memory of the late Honorable Stephen Cheong, a founding Council Member and renowned public servant.



## Early Research Success for Undergraduates



Teamwork and individual enterprise at the School have both been recognized with two awards for undergraduate students' work in the 2011 President's Cup.

Siwan Lu, Chemical Engineering and General Business Management, and Weicheng Luo, Leiting Zhang and Yuan Zhong, all from Chemical and Biomolecular Engineering, took the Gold Award for their project focusing on the design of

lithium-ion batteries for electric vehicles. All students graduated in 2011.

The Silver Award went to Yaxiong Cai, Year 2, Mechanical Engineering, for a study on full-field deformation measurement of wave propagation inside porous solids using digital image correlation.

The President's Cup is a competitive HKUST event held annually to encourage creativity and recognize students' outstanding achievement in research and innovation.



## Student Honors, Awards and Achievements

- Shuk Wun Cham and Ka Yin Yip, Civil and Environmental Engineering, were awarded the Student Paper Award 2011 by The Chartered Institution of Highways & Transportation (Hong Kong Branch). Their paper centered on "Modeling Transport Management and Land Value". Both students graduated in 2011.



- Dickens King Hei Chan, Ming Hong Cheng, and Kam Fung Tam, Electronic and Computer Engineering, won the Varitronix 30th Anniversary Scholarship for the Best Final Year Project on Display Technology 2010-11 for their study on "3D Displays". All the students graduated in 2011. Varitronix Limited, one of Hong Kong's leading LCD manufacturers, has donated HK\$150,000 to the Department of Electronic and Computer Engineering for the final year project award from 2008-2012 (HK\$30,000 each year).



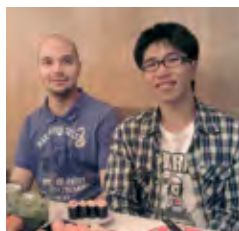
- MPhil student Wai Kit Chan, Chemical and Biomolecular Engineering, together with Prof KL Yeung and Dr Wei Han, research associate, in the same department, won the Best Poster Award at the International Conference on Materials for Advanced Technologies 2011. The winning poster title focused on "Advanced Ozone-membrane Reactor for Treatment of Endocrine Disrupting Compounds in Water". Wai Kit graduated in 2011.



- An undergraduate programming team, comprising Qifeng Chen, Yuliang Li, and Tsz Yeung Ng, Computer Science and Engineering, won the championship in the Association for Computing Machinery-Hong Kong Programming Contest 2011. Eight local tertiary institutions participated.



- The joint study "Optimal Lattices for MIMO Precoding" by PhD exchange student Dzevdan Kapetanovic from Lund University in Sweden and MPhil student Hei Cheng, Electronic and Computer Engineering, won the Best Student Poster Award at the



first IEEE Swedish Communication Technologies Workshop. The workshop was held at the Royal Institute of Technology (KTH), Stockholm, Sweden.

- PhD student Hui Cheng, Industrial Engineering and Logistics Management, won the Best Paper Award at the 8th International Conference on Service Systems and Service Management in Tianjin. His paper explored "The 3PL's Optimal Transportation Pricing Problem in Dynamic Lot Sizing Models".
- Ka Chun Cheung, Chun Yim Wong, and Siu Hung Yuen, Computer Science and Engineering, received the Hong Kong Information Technology Federation ICT Final Year Scholarship 2010-2011 Certificate of Merit for their final year project "A Collaborative Android Application Providing an Online Google Map with Audible Cantonese Location Pronunciations for Expats and Tourists in Hong Kong". The application assists people from overseas by providing pronunciation and written text for place names in English, Cantonese and Putonghua. The system utilizes a built-in Android text-to-speech (TTS) engine for English, an open source TTS engine for Putonghua, and a custom-made TTS engine for Cantonese. It also links to a website called Expat/Tourist Sharing Board, which was created by the students and provides additional useful information. Ka Chun is a final year student while Chun Yim and Siu Hung are 2011 graduates.



- Undergraduate Marco Cheung, Chemical & Bioproduct Engineering and General Business Management, and his Eco\$ave teammates won the first prize in the Lee Kuan Yew Global Business Plan Competition in Singapore. The inter-university team, comprising HKUST and University of Hong Kong students, was awarded prize money of US\$36,000 for its innovative solution to encourage rational detergent use among consumers.



- PhD student Shammi Akter Ferdousi, Chemical and Biomolecular Engineering, won the Gold Award for the Best Poster Presentation at the Asia Nanotech Camp 2011. The camp fosters young leaders in nanotechnology in the region, especially PhD and postdoctoral researchers, by providing a platform for them to learn more about developments in the field in different countries. The gathering was hosted by Korea's Ministry of Education, Science and Technology, and organized by the Korea Nanotechnology Research Society, National Nanotechnology Policy Center and Asia Nano Forum.



- PhD student Jing Guo, Electronic and Computer Engineering, received the 2011 IEEE Custom Integrated Circuits Conference (CICC) Student Scholarship Award for her paper “A 38.6nV/Hz0.5-59.6dBTHD Dual-Band Micro-Electrode Array Signal Acquisition IC”. The conference is the premier event devoted to integrated circuit development.



- MPhil students Jenny Huang and Jiale Han, Mechanical Engineering, came first and third respectively in the CISCO Best Student Paper Awards at the 2011 International Conference on Electronic Packaging Technology and High Density Packaging.



- Yuen Man Ip, Year 2, Chemical and Biomolecular Engineering, received the Paul and May Chu Sportsman/Sportswoman of the Year Award 2010-11 for her dedication to fitness and her role as founding captain of the Student Women’s Soccer Team. The award was established in 2010-11 with a fund raised in the Fun Run in honor of the departing President Prof Paul Chu in 2009.



- PhD student Xiaolin Li, Electronic and Computer Engineering, was selected to join the 2011 Asia-Oceania Top University League on Engineering (AOTULE) Summer Student Exchange Program. This enabled Xiaolin to spend three months conducting research with a host researcher at Tokyo Institute of Technology. He was one of 12 students from the 11 member universities of AOTULE to join the program.

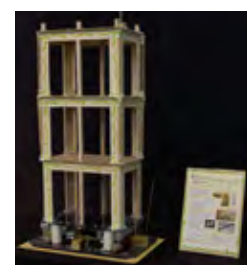


- PhD candidate Nathan Liu and Prof Qiang Yang, Computer Science and Engineering, won the Springer Prize for Best Interdisciplinary Paper at the 20th ACM Conference on Information and Knowledge Management. Their paper, titled “Transferring Topical Knowledge from Auxiliary Long Text for Short Text Clustering”, focused on how to effectively classify short text in Social Media such as Twitter. The conference was held in Glasgow, UK. Nathan and Prof Yang, together with 2011 PhD graduate Bin Cao, research assistant Luheng He, also won third place in the 2011 ACM Challenge, which is the world’s best known annual competition in data mining. This year’s competition was attended by over 2,000 teams worldwide.



The HKUST group teamed up with researchers and students at Shanghai Jiao Tong University to propose a collection of large-scale machine learning and data mining techniques to tackle this year’s data mining task, which focused on personalized musical recommendations. Their algorithm was also rated the best among all the submissions in the single-model category. The 2011 Challenge was organized by Yahoo! Labs.

- A Civil and Environmental Engineering postgraduate team, comprising PhD students Sung Hei Luk (team leader), Wenqi Du, Po Chi Suen and Zhe Wang, won the Best Presentation Award First Prize at Introducing and Demonstrating Earthquake Engineering Research in Schools 2011 (IDEERS 2011). The event was held by the National Center for Research on Earthquake Engineering in Taipei. An undergraduate team consisting of Chi Ho Lau, Ka Sing Lau, Sin Hang Law and Ting Kwok Wan won the Most Creative Architectural/Art Design Award. Participants had to create a model using inexpensive materials and then subject their structure to a shaking test.



- PhD student Daniel Yiu Wing Mo, Industrial Engineering and Logistics Management, received a prestigious Sir Edward Youde Memorial Fellowship 2010/2011. The honor recognizes academic excellence among postgraduate students. Daniel was also awarded a Sir Edward Youde Memorial Fellowship in 2004 during his Master’s degree.



- PhD student Zhiliang Qian, Electronic and Computer Engineering, has received the RGC-Fulbright Hong Kong Dissertation Research Programme – Junior Research Award 2011-12. The award enables senior scholars and advanced postgraduate students from Hong Kong universities to conduct research at American universities.



- MPhil student Miao Yu, Electronic and Computer Engineering, received the Best Presentation award at the Asian Science and Technology Pioneering Institutes of Research and Education (ASPIRE League) forum in Seoul, Korea.

## Great Display at Inaugural Lecture by **Distinguished Research Excellence Award Recipient**

More than 120 guests, industry partners, faculty members and students attended the inaugural Distinguished Research Excellence Award Keynote and Award Ceremony, hosted by the School of Engineering on November 28 at the Charles K Kao Auditorium at Hong Kong Science Park.

The lecture on "Future Directions of Display Technologies" was given by Prof Hoi Sing Kwok, Dr William M W Mong Chair Professor of Nanotechnology of Electronic and Computer Engineering, and the first recipient of the School of Engineering Distinguished Research Excellence Award.

Dean of Engineering Prof Khaled Ben Letaief and HKUST President Prof Tony F Chan gave introductory speeches at the event.

The School of Engineering established the annual Distinguished Research Excellence Award, Research Excellence Award, and Young Investigator Research Award in 2011. The Distinguished Research Excellence Award, the most prestigious, honors an engineering faculty member with exceptional research achievements and significant impact locally and globally. The recipient is invited to deliver a public lecture, a distinction in itself.

In his talk, Prof Kwok discussed some of the state-of-the-art technologies being developed and introduced activities at the Center for Display Research at HKUST. These include energy-saving liquid crystal displays, alignment surfaces, active-matrix organic light-emitting diodes, and bistable displays. He sees greenness as an essential theme for future displays. He also shared his views on product development and the deployment of new technologies over five-year and 10-year horizons.

The presentation was supported by the Electrical Division of the Hong Kong Institution of Engineers, Institute of Electrical and Electronics Engineers, and The Institution of Engineering and Technology.



## 100 Attend **Nano Postgraduate Workshop**



Around 100 participants took part in the lively East Asian Postgraduate Workshop on Nanoscience and Technology, organized by the Department of Electronic and Computer

Engineering and Department of Physics from June 15-17 at HKUST.

Arranged by and for postgraduates, the workshop's goal is to set up a unique platform for those involved in nanoscience and technology research in the East Asian region to share their most recent work and research experience. Just as importantly, it offers a great opportunity to initiate and establish international collaborations.

The gathering brought together postgraduates from Singapore, Japan, Korea, Taiwan, Malaysia and Mainland China, with 41 oral presentations and 49 poster presentations given during the event. Five students were selected for Best Oral/Poster Presenter Awards.

## First Asian Conference for **IIE**

The Department of Industrial Engineering and Logistics Management (IELM) jointly organized the first Institute of Industrial Engineers (IIE) conference to be held in Asia together with Shanghai Jiao Tong University in June 2011. Held in Shanghai, the conference gathered scholars and industrial experts to discuss industrial engineering research and applications in Asia as the region rises in importance globally.

With Asia now the largest manufacturing center in the world,

there are fresh opportunities and challenges for industrial engineers in the region and a demand for a broad range of industrial engineering techniques. The environmental industry and other emerging fields also offer new directions and openings.

Prof Fugee Tsung, Head of IELM, was the conference's general co-chair. IIE is the world's largest professional society in the field.



## HKUST Research Forum Series Launched

The first event in the HKUST Research Forum Series was successfully held on November 3, with the focus on the great global challenge of energy. The series seeks to enhance synergy between faculty members and students within and across disciplines, and to nurture a collaborative research atmosphere and culture.



At the inaugural forum, co-organized by the Office of the Vice-President for Research & Graduate Studies and School of

Engineering, two internationally renowned scholars, Prof Qingyan Chen, Vincent P. Reilly Professor of Mechanical Engineering, Purdue University and Prof Surendra Shah, Fellow of the Institute for Advanced Study, HKUST and Walter P. Murphy Professor of Civil and Environmental Engineering, Northwestern University shared their visions on energy research directions. Mr Bob Aylsworth, Vice President, WW Engineering and Chief Innovation Officer, Embedded Computing & Power, at Emerson Network Power, was also invited to talk about research challenges in energy in industry.

To share what was ongoing in the field at HKUST, 11 projects on energy research, funded by the University's Special Research Fund Initiative, were presented. Topics included sustainable buildings, ecotronics, ethanol fuel cells, and sustainable energy.

## First SENG PhD Research Awards Presented

Three 2011 PhD graduates became the first recipients of School of Engineering PhD Research Excellence Awards when they were presented with their honors at a special ceremony in November.

The winners were Dr Weiping Wang, Chemical and Biomolecular Engineering, Dr Huanfeng Duan, Civil and Environmental Engineering, and Dr Yu Zhang, Computer Science and Engineering. In addition, 2011 graduate Dr Yinshi Li, Mechanical Engineering, received an Honorable Mention.

The awards recognize the outstanding achievements of the School's PhD students and recent graduates, being granted to those who have made significant and influential contributions to their discipline during PhD studies at HKUST.

"HKUST has a strong tradition of excellence in engineering research," said Prof Ajay Joneja, Chair of the Engineering Research Committee which assessed the award candidates. "It was really difficult for the Committee to select such a small set of winners from a much larger number of highly accomplished

PhD students and graduates. We are very proud of the achievements of all the contestants, for their numerous innovative contributions in areas that are relevant in shaping the society of the future."

Dr Wang also received the Young Investigator Award at the 5th World Association for Chinese Biomedical Engineers (WACBE) World Congress on Bioengineering in Taiwan and the Air Products Award for the Best Chemical and Biomolecular Engineering Postgraduate Student 2011.



## In Remembrance

It is with great sadness that *In Focus* reports the passing of two members of the School of Engineering.

Undergraduate Bo Wing Lo, Year 2, Mechanical Engineering, succumbed to acute leukemia in June after a brave battle. Bo Wing was an outstanding student whose good-natured presence made a positive difference to her fellow students and teachers alike.

Alumnus Jeffrey Wai Hung Chung, Class of 1998, Computer Engineering, was involved in a tragic accident while on a climbing trip in Pakistan in May. Jeffrey was an enthusiastic climber and had previously tackled mountains in Japan, Taiwan and China.

Both will be much missed by classmates and faculty members at HKUST.

## Opening Up Options for Room Designs



Wouldn't it be wonderful to alleviate one of the headaches of moving or renovating your home by having different options for furniture arrangements available at the click of a button?

Alumni researchers Sai Kit Yeung and Craig Yu thought so and have now helped to turn this great idea into virtual reality as part of the high-flying team behind the Make It Home computer software.

Advances on previous programs used by furniture retailers include automatic rather than manual rearrangement of furniture and multiple solutions enabling Make It Home to produce various room designs in 20 seconds compared with around 20 minutes for one layout.

Also involved in the project were HKUST President Prof Tony F Chan as research advisor and Prof CK Tang, Computer Science and Engineering, together with academics from the

University of California, Los Angeles.

Along with interior designers and home movers, others who could find the program useful include movie set designers and video game developers. In addition, there is potential for assisting shopping mall layouts and city planning.

"After training at HKUST, we are proud to say we have a very solid foundation of skills on which to build," said Sai Kit, who completed his bachelor, master's and doctoral studies at SENG. Craig undertook his bachelor and master's at the School.

Make It Home has been written about in the international magazine, *New Scientist*, and local media, and was accepted to SIGGRAPH, the prestigious computer graphics conference held in Vancouver in August 2011.

### Sai Kit Yeung

*BEng in Computer Engineering, MPhil in Bioengineering, PhD in Electronic and Computer Engineering, HKUST; Postdoctoral Scholar, UCLA and HKUST; Assistant Professor, Singapore University of Technology and Design*

### Craig Yu

*BEng/BBA Dual Degree Program in Technology & Management (Computer Science + General Business Management), MPhil in Computer Science, HKUST; PhD student, UCLA*



## Corporate Governance Honor for Jack Lau

Prof Jack Lau, Electronic and Computer Engineering alumnus and HKUST's first PhD graduate, continued his award-winning success when he was honored with a Directors Of The Year Award 2011. He received the accolade from the Hong Kong Institute of Directors, a premier body representing professional directors working together to promote good corporate governance and director professionalism.

Prof Lau is the Chairman and Chief Executive Officer of Perception Digital Holdings Limited, which specializes in hi-tech solutions for consumer electronics

and technology commercialization. Perception Digital is the largest company set up under the HKUST Entrepreneurship Program and went on to become the first from the program to gain a public listing on the Hong Kong Stock Exchange. "I have long believed that a company can only be successful if it has a solid footing in its board and company governance," Prof Lau said.

Prof Lau has previously received the Ernst & Young Entrepreneur of the Year Award, and Young Industrialist Award, and has been named one of Hong Kong's Ten Outstanding Young Persons and World Outstanding Young Chinese Entrepreneur.





## Diverse World of **Disneyland Industrial Engineer**

*Ken Leung, 1996 BEng (Industrial Engineering and Engineering Management), is now Industrial Engineering Project Manager at Hong Kong Disneyland, where the flexibility and analytical thinking he learnt as a student is helping him to solve different business challenges*

"I have been curious how corporations run and systems operate since I was young. The field of industrial engineering fascinates me because it equips you with principles and analytical engineering methodologies which can be used to solve complex business problems.

"Back in the early 1990s, I was among the first cohort of students admitted to SENG's industrial engineering undergraduate program. A new university at that time, HKUST has gone on to demonstrate itself to be a truly forward-looking institution. Indeed, this was already reflected in the curriculum design for my program, which covered topics dealing with the latest developments in the field and adopted a wide perspective.



"In today's corporate world, senior executives make business decisions based on objective justifications. At SENG, students gain skills such as quantitative analysis and systematic thinking which provide a firm basis for decision-making.

"What I enjoy about the life of an industrial engineer is the variety. At Hong Kong Disneyland, for example, I have taken part in projects ranging from the design of flow logistics for the central kitchen to the development of the FASTPASS system, from implementation of radio-frequency identification (RFID) for park-wide costume distribution and tracking to the planning of requirements for marathon runners in the resort area.

"Such assignments are just part of the exciting work for industrial engineers at Hong Kong Disneyland as we look for innovative solutions to enhance operational efficiency and improve our guests' experience."

## Honors and Achievements

■ Cheryl Suet Ying Cham, 2008 BEng in Civil and Structural Engineering and BBA in General Business Management, and Prof Kenny Kwok, Emeritus Professor, received the Hong Kong Institution of Engineers Outstanding Paper Award for Young Engineers/Researchers 2011 for a paper on "Terrain Characterization and Design Wind Profiles for Hong Kong". The study focuses on Cheryl's final year project, supervised by Prof Kwok. In this project, Hong Kong wind characteristics obtained from studies undertaken at HKUST's CLP Power Wind/Wave Tunnel Facility over the years were analyzed and more representative wind profiles proposed for adoption in future editions of the Code of Practice on Wind Effects Hong Kong.



■ Harry Lee, 1999 BEng, 2001 MPhil, Chemical and Biomolecular Engineering, received the Young Engineer of the Year Award 2011 from the Hong Kong Institution of Engineers. The honor recognizes outstanding young engineers who have made engineering achievements and valuable contributions to the continuous development of Hong Kong.



■ 2011 PhD graduate Dr Dong Li, Electronic and Computer Engineering, received the 2011 Young Scientist Award in Engineering Science, organized by the Hong Kong Institution of Science. The award recognizes his innovative research, which focuses on developing optical imaging technologies and exploring their biological and medical applications. During his PhD studies, he developed a straightforward, cost-effective method to implement label-free and multi-modal nonlinear optical microscopy, among other discoveries.



# School's Innovation Award Honors Tencent Chairman



A prestigious award newly set up by the School of Engineering (SENG) to recognize business leadership and creativity was awarded to Mr Pony Huateng Ma, Chairman and CEO of Tencent Holdings Ltd. The first HKUST Technology Industry Innovation Award was presented to Mr Ma

in December for his success in commercializing innovative ideas and their positive impact on society.

As one of the world's leading engineering schools, SENEG established the high-level accolade to recognize the efforts of a top technology leader who has demonstrated outstanding achievement and leadership in implementing technological innovations that have had a global impact on improving people's lives. It will also encourage greater interaction between the School and industry.

Tencent has developed leading online platforms, including the QQ instant message system and wireless QQ portal, bringing

together Mainland China's largest internet community. Active QQ accounts exceed 700 million. It is now one of the largest integrated internet services companies in the world and among the largest internet companies globally in market capitalization.

At the award presentation ceremony, held during the major HKUST Forum on Innovation for the Future of Hong Kong and the Pearl River Delta, Mr Ma gave a speech on "Reflections on the Innovation and Entrepreneurship of the IT Industry in China". He said that Tencent was committed to innovation in its business model and put a strong focus on user experience. Recently, it had assisted other companies' innovation and growth through open platform strategies.

Mr Ma believed that the training of innovative talents was another key success for corporate development. He said HKUST and Tencent shared the same vision on innovation and he hoped Tencent and HKUST would continue to promote innovative technology through research and business development.

## Calendar of Events

### February, 2012

Secondary Schools Bridge Demonstration Competition  
HKUST Campus

### February 15, 2012

Opening Ceremony of HKUST NIE Social Media Laboratory  
HKUST Tin Ka Ping Hall

### May, 2012

Electronic and Computer Engineering Final Year Project Industry Day  
HKUST Campus

### July 31 – August 3, 2012

Asian Network for Quality (ANQ) Congress  
Hong Kong

### August 19-25, 2012

62nd College International pour la Recherche en Productique (CIRP) General Assembly  
Hong Kong

## 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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