

## SENG Ranked Among Global Leaders in Engineering and IT



January 21, 2005, proved a great day to remember for the School of Engineering (SENG) when over 150 guests gathered at the Island Shangri-La Hotel to celebrate the School's number 20 ranking in the World's Top 100 Universities in Engineering & IT league table. The rankings were published by The Times Higher Education Supplement (THES) in December and HKUST was the only Hong Kong institution ranked in the top 50.

Among those attending the ceremony to mark the School's global achievement were guest of honor Dr. Alice Lam, Chairman of the University Grants Committee, Dr. John Chan, Chairman of HKUST's University Council, and HKUST President Prof Paul Chu.

"In the past year, HKUST has been acknowledged as a global leader in engineering as well as a host of other fields," President Chu said. "These are remarkable achievements for HKUST and are a testament to the commitment and contributions of our founders, faculty and staff, students, and of course the overwhelming and generous support of the entire Hong Kong community."



Rankings for the THES league table were based on a peer review. Some 1,300 international academics were asked for their opinions about top universities in subject areas and regions where they have expert knowledge.

"We are a young and dynamic school in a forward-looking, research-centered university," Dean of Engineering Prof Phillip Chan said. "To come so far so fast, to be named alongside some of the world's most established engineering institutions, reflects both the vision of our research-centered university and the dedication of our faculty. Under their clear-headed and imaginative leadership, SENG's role in the community, both as an education and faculty, is certain to grow."

At the ceremony, both the President and the Dean of Engineering also took the opportunity to thank the HKSAR and donors for their continued support, while SENG faculty members shared their delight at the School's success with the business community members and alumni in attendance.

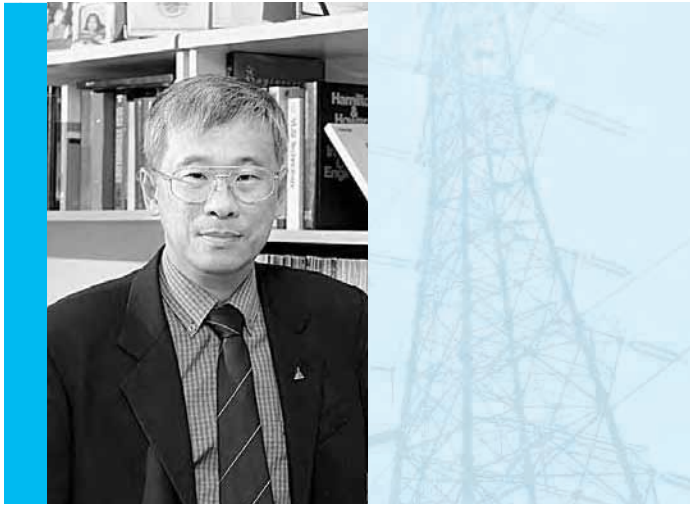
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### The World's Top Universities (Engineering & IT)

- 1 *University of California, Berkeley (US)*
- 2 *Massachusetts Institute of Technology (US)*
- 3 *Stanford University (US)*
- 4 *Indian Institutes of Technology (India)*
- 5 *Imperial College London (UK)*
- 6 *California Institute of Technology (US)*
- 7 *Tokyo University (Japan)*
- 8 *Cambridge University (UK)*
- 9 *National University of Singapore (Singapore)*
- 10 *Peking University (China)*
- 20 *The Hong Kong University of Science and Technology (Hong Kong)***
- 95 *The Chinese University of Hong Kong (Hong Kong)*
- 100 *RMIT University (Australia)*

# Message from the Dean



As you will have learned from our Cover Story in this issue of In Focus, HKUST's School of Engineering has been ranked number 20 in the World's Top 100 Universities in Engineering & IT league table, published by The Times Higher Education Supplement. This achievement results from the collective efforts of our faculty, staff and students. I would also like to express my gratitude to our Court and Council Members, as well as our partners in the business and professional communities. Thanks to all of you. Without your support, we would not have made it.

From its earliest days, the School of Engineering has focused on carefully selected fields that lie at the cutting edge of technology: information technology; logistics and supply chain management; integrated circuits; advanced materials; nanotechnology, to name just a few. We also chose these areas for their potential contribution to Hong Kong's economic development. Our success in the rankings again vindicates our highly focused approach. There is great potential for industries to leverage and build high-end products and open new markets in such fields.

In the years to come, we will keep our sights on both excellence at the highest international level and on contributing to Hong Kong's economic development through the innovations and technologies we develop at HKUST. This is a time to celebrate. However, we must not be complacent. Our achievements should only push us to work harder in order to attain even greater heights in the quest for excellence.

Thank you all again.

Prof Philip Chan  
Dean of Engineering

## New Academic Appointments

### New Visiting Faculty Members

- **Prof Tongwen Chen**  
Visiting Professor, Electrical & Electronic Engineering  
*PhD - University of Toronto*
- **Prof Xiuli Chao**  
Visiting Professor, Industrial Engineering and Engineering Management  
*PhD - University of Columbia*
- **Prof Peihua Gu**  
Visiting Scholar, Industrial Engineering and Engineering Management  
*PhD - University of McMaster*

### New Adjunct Faculty Appointed

- **Prof Kwok-Leung Chung**  
Adjunct Professor, Civil Engineering  
*MSc - University of London*
- **Prof William Ko**  
Adjunct Professor, Civil Engineering  
*MSc - University of Birmingham*
- **Prof James Lau**  
Adjunct Professor, Civil Engineering  
*PhD (Geotechnical Engineering) - University of London*
- **Prof Wenwu Zhu**  
Associate Adjunct Professor, Electrical and Electronic Engineering  
*PhD - Polytechnic University*

## International Honors and Awards

**Prof Charles Ng** (Civil Engineering) has recently been offered an Overseas Fellowship at Churchill College, Cambridge. These fellowships are intended for distinguished visitors who will spend a full academic year at the college who are likely to be, for example, full professors, hold honors equivalent to the FRS or FBA and be world class in their discipline.

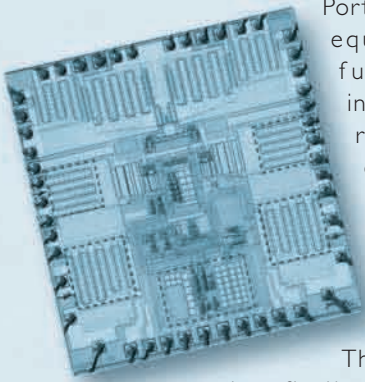
**Prof Cao** (Electrical and Electronic Engineering) has been appointed as Chair of the Institute of Electrical and Electronics Engineers (IEEE) Fellow Evaluation Committee of IEEE Control Systems Society for 2005.

**Prof Wilson Tang** (Civil Engineering) has been elected an Honorary Member of the American Society of Civil Engineers. Prof Tang is cited for his significant contributions to safety and reliability analysis in civil engineering with emphasis on application to geotechnical systems.

**Prof Chung-Yee Lee** (Industrial Engineering and Engineering Management) has recently been selected as a Fellow of the Institute of Industrial Engineers of the United States.



## Researchers Race Forward with IC Technologies at 'Chip Olympics'



Portable electronics and wireless equipment are set to shrink further and carry more information in the future as a result of innovative research carried out by Dr Hoi Lee (PhD, 2004) and Wing Lun Ng (Year 2, MPhil program) of the Electrical and Electronic Engineering Department.

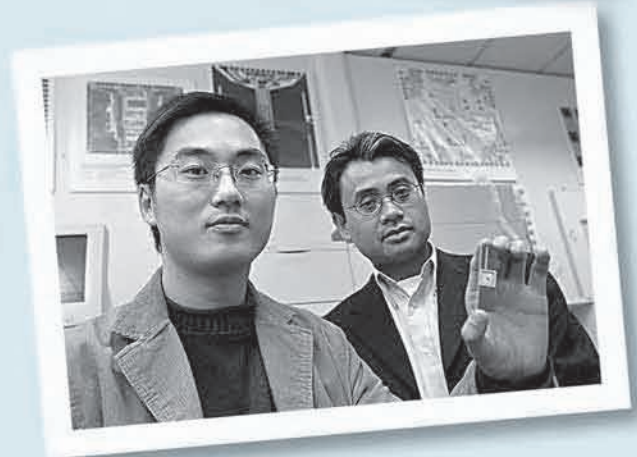
The two researchers' cutting-edge findings were presented at the prestigious International Solid-State Circuits Conference in San Francisco, also referred to as the "Chip Olympics", in February. An invitation to give research papers is highly prized and HKUST is the only Hong Kong institution to appear at the event so far. HKUST researchers have presented papers almost annually since 1997.

Dr Hoi Lee's research has focused on answering the demand for lower supply voltage and longer battery lifespan for the new generation of portable electronics and the ever-increasing need to lower costs in today's fiercely competitive global economy. By successfully improving the design of power management integrated circuits through switched-capacitor power converter modules and pseudo-continuous output regulation technology, Dr Lee has reduced chip size by 20% and capacitor value 10 times. As a result, this has lowered production costs five times.

Last year, Dr Hoi Lee received the IEEE Custom Integrated Circuits Conference's first Best Student Paper Award. This January, he took up the post of Assistant Professor at the University of Texas, Dallas.

Meanwhile, Wing Lun Ng has concentrated on improving high frequency wireless applications. Ng and his team have developed a novel, ultra-low-voltage high-frequency voltage controlled oscillator (VCO) and "recycled" the electric current for the frequency divider in the phase locked loop (PLL), the component that maintains stable communication frequency, to minimize total power consumption. They have also fabricated a prototype using the cheapest complementary metal oxide semiconductor (CMOS) process that has achieved 24GHz output frequency. Such developments thus reduce costs while providing maximum operational frequency, minimum supply voltage and low power consumption.

Both Dr Hoi Lee and Ng have acknowledged the role HKUST had played in creating an environment that encouraged inventiveness and thanked their respective supervisors Dr Philip Mok and Dr Howard Luong for their effective guidance and encouragement.



## IT Key Lab Opens Door to Research Opportunities

World-class research at HKUST has been given a huge boost with the recent establishment of the Ministry of Education (MOE)/Microsoft Research Asia (MSRA) Information Technology Key Laboratory at the University, according to Prof Lionel Ni, Key Lab Director and Head of the Department of Computer Science. "This is the first time a MOE Key Lab has been established in Hong Kong," Prof Ni said. "It really is a great honor."

Academic exchange and research collaboration between HKUST and Beijing-based, multi-nationally staffed MSRA, one of the top IT research laboratories in the world, began in 2000 with the establishment of the MSRA/HKUST IT Joint Research Laboratory. This provided opportunities for a small number of faculty and PhD students mainly in the Department of Computer Science and Department of Electrical and Electronic Engineering Department.

Recognition by the MOE as a Key Lab will further enhance this collaboration, opening up the possibility of faculty involvement across the University. Key Lab status will also extend funding opportunities and HKUST's profile as a leading IT research institution, Prof Ni explained. The status of the IT Key Lab will be evaluated by MOE after five years, based on performance. There is hot competition among institutions in China for the honor.

"At this moment we have identified three areas to work on together with MSRA: vision and computer graphics; systems and networking; and large-scale information management," Prof Ni said.

One renowned research area involves state-of-the-art advances in 3D graphics and design. Last year, Prof CK Tang of the Department of Computer Science, working with Prof Harry Shum, now MSRA's managing director, presented two papers at the annual SIGGRAPH conference, the world's most prestigious event for computer graphics researchers.

"We are good for each other. When the best work with the best, it really triggers a lot of new ideas," Prof Ni said.

Another mission is to work with MSRA to jointly produce additional PhDs to help IT education and research on the mainland. "The Key Lab status will help raise our profile in the Mainland and enable us to attract top PhD students," Prof Ni explained. "As soon as people there know we have an IT Key Lab, immediately we get respect."



Prof Chu (second right) takes a group picture at the signing ceremony.

Indeed, the impact of the IT Key Lab, established in November 2004, is already being felt, with Prof Ni receiving many requests from Mainland academics to come as visiting scholars to work with HKUST faculty. "I am very happy to see such collaboration between researchers," he said.

Hong Kong as a whole will also benefit. Each year MSRA hosts a major IT event in Beijing, and one other city in China. This year, for the first time, Hong Kong has been selected to be that city. MSRA's "21st Century Digital City", to be held at the HKUST campus, will feature presentations by Turing Award winners (computer science's Nobel Prize) and world-class researchers to raise interest in IT across the community.

"In Mainland China and Taiwan, IT is still hot, but with the IT bubble gone, Hong Kong people have cooled down," said Prof Ni. "This is short-sighted in my view. Such an event will be a very good opportunity to help the Hong Kong community become more aware that everywhere in our lives we require IT."





## IEEM-Stanford Joint Global Manufacturing Program Celebrates 10th Anniversary



In 1995, students from the Department of Industrial Engineering and Engineering Management (IEEM) met up with their counterparts from Stanford University, US,

to tackle together business problems of the day on an innovative Global Manufacturing Program.

This was the first time the joint IEEM-Stanford course on global manufacturing and supply chain logistics had been offered. It was not the last. And on March 21, 2005, members of both universities gathered at Tin Ka Ping Hall on the HKUST campus to celebrate the 10th anniversary of the successful annual program, which fosters creative young leaders and builds company capabilities.

The program runs each Spring semester with a number of students from each university working together as a team on a problem set by an industrial organization. This year's business sponsors are Li & Fung, Novell, Esquel Enterprises Ltd and PCH International Ltd.

Participants learn to look at practical global issues related to strategic planning, product development and design of supply chains and then fathom solutions. In teaming up students from East and West, the program also enables participants to gain a cross-cultural perspective, improve their communication skills and to learn how to work with people from different countries.

Another major benefit is the opportunity for students to gain business exposure and learn about specific industries. "The students not only experience the value of teamwork but can also interact with senior executives," said Program Director Prof Mitchell Tseng, also Director of HKUST's Advanced Manufacturing Institute.

Meanwhile, the businesses involved can enhance their capabilities as a result of the students' work.

During the program, students meet for problem formulation and joint meetings at Stanford and HKUST, make company visits, and utilize teleconferencing, webcam and videoconferencing to coordinate project management when team members are back at their respective campuses.

*Prof Hau Lee of Stanford meets with Prof CHAN CHI-MING of HKUST.*



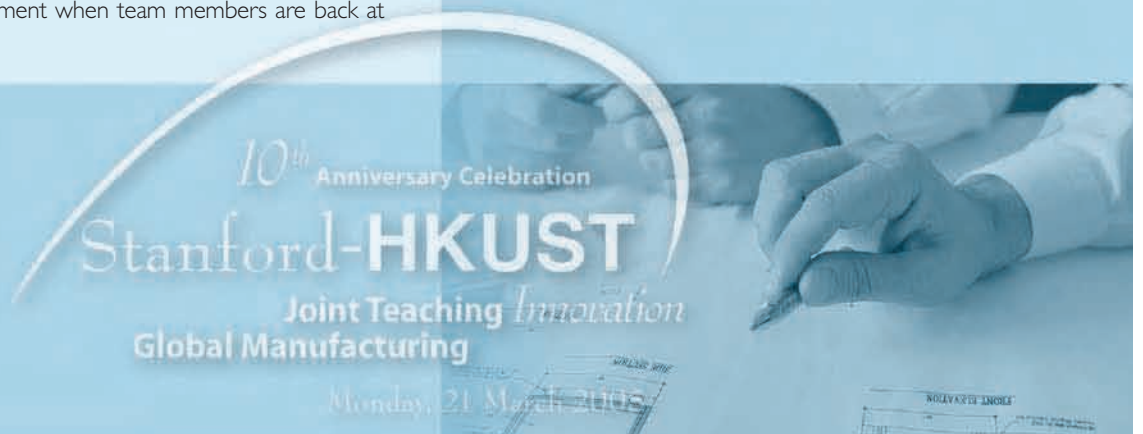
Prof Chung-Yee Lee, Head of IEEM, said the program had run smoothly throughout the decade it had been operating and had received great support. The collaboration between HKUST and Stanford over such a length of time and to such a consistently high standard validated the drive for excellence that HKUST seeks to provide for students, he noted.



*A group photo of the two endearing families: Stanford University and HKUST.*

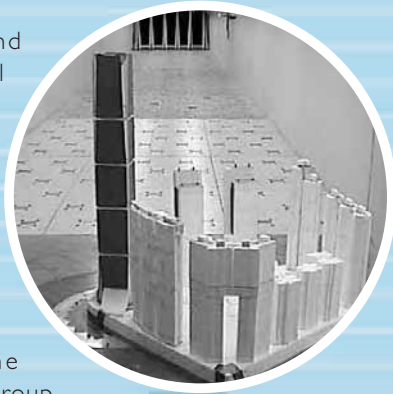
Dean of Engineering Prof Philip Chan said he was delighted that the program had reached its 10th year. "Over the years, we have helped nurture many graduates with good business acumen through this challenging experience," he said. "It provides a taste of the real business world. And in addition to practical experience, students also have a chance to learn more about each other's culture."

Prof Chan expressed his thanks to all the companies who had participated as sponsors in the past decade and said he looked forward to other businesses joining the program in the future. "We are tremendously grateful to all the international companies who have sponsored the program and we hope to add more and more to the list in the years to come," he said.



## Testing the Wind for Future Skyscraper Design

Tall office buildings and high-rise residential buildings in Hong Kong and elsewhere around the world could become more cost-effective and offer better design quality, space utilization and performance under strong winds with the funding of an exciting group research project led by Prof Kenny Kwok, Professor of Civil Engineering and Director of the CLP Power Wind/Wave Tunnel Facility.



Prof Kwok, the project's principal investigator, was recently awarded a Central Allocation Grant of HK\$3.45 million over three years to investigate "Innovative Design Technologies for Tall Buildings in a Typhoon-Prone Urban Environment". He leads a team of six others, including HKUST faculty colleagues and one faculty member each from Hong Kong Polytechnic University and the University of Hong Kong.

The project seeks to develop computer-based optimization algorithms for performance-based design of tall buildings; to explore and refine wind tunnel test methodology to determine wind loads and wind-induced responses of tall buildings with complex shapes; to formulate frequency dependent serviceability criteria for occupant comfort in wind-excited tall buildings; and to better understand the performance of actual tall buildings under typhoon conditions.

"Hong Kong is the perfect location because the city has many high-rise buildings, many unusually shaped tall buildings, and strong winds," Prof Kwok said. "And as most people live in high-rise buildings, it affects everybody."

One unique facility helping research into occupant comfort is the HKUST motion simulator, built by Prof Kwok and colleagues and specifically designed to look at the effect of motion on people during storms in a building environment. "No other institution in the world has a wind tunnel and motion simulator combined," Prof Kwok said. Researchers are already in the process of revising the international acceptance criteria for occupant comfort for wind-excited tall buildings (ISO 6897:1984(E)).

Prof Kwok foresees the most difficult - and ambitious - aspect of the new research project will involve computer-based optimization and performance-based design. However, it is also an area which holds great potential for encouraging more environmentally responsible construction.

"Most tall buildings in the world, including Hong Kong, are still conservatively built using more materials and space than is necessary," Prof Kwok said. "We want to redistribute the load-bearing members more efficiently round the building to create additional useable space. The client then has more saleable or rentable area, the occupant more room to move around in, less materials are required, and, when it is time to recycle the building, there is less waste. It's a win-win situation."



"Current practices suggest most buildings are not being optimized to the level they could withstand."





## Executive Mentors Provide Early Business Links for Dual Degree Students

The third Confluence Mentorship Program is now well underway, with students on the elite Dual Degree Program in Technology and Management among the major beneficiaries.

All second-year students taking the high-flying Dual Degree have been able to enjoy the advantages of the innovative, year-long mentoring program, organized by the University's Student Affairs Office. The scheme, launched annually in October, assigns senior executives of global companies and government department officials to students in a one-on-one mentoring relationship to help nurture academic, career and personal development. Activities are organized by mentors and students themselves.

The mentoring scheme is another dynamic aspect of the Dual Degree, which is designed to groom future leaders in technology and business, and is taught by the School of Engineering and the School of Business and Management. Professor Chan Chi-ming, Associate Dean of the School of Engineering and Co-Director of the Dual Degree Program, explained that mentoring enabled each second-year Dual Degree student to forge a direct link with industry. "This is valuable, real-world experience that can't be replicated in any classroom," he said.

Other Dual Degree enrichment activities include internship positions and the High-Tech Entrepreneurship Program, in

which small teams of students work to develop new commercial products. The exchange program widens horizons further with students studying overseas for one or two semesters in host institutions selected from among more than 85 recognized international institutions.



## Teaching Excellence Awards



*Prof Philip Chan presents the award to Prof Chan Chih-Chen.*



*Prof Philip Chan presents the award to Prof Amine Bermak.*

Congratulations to the three School of Engineering professors who have become the latest recipients of the Bechtel Foundation Engineering Teaching Excellence Awards. The honors were presented to Associate Professor Chan Chih-chen, Department of Civil Engineering, Assistant Professor Amine Bermak, Department of Electrical and Electronic Engineering, and Associate Professor Zhao Tianshou, Department of Mechanical Engineering, at a ceremony in October.

The awards recognize the work of faculty members who demonstrate continuous excellence in the teaching of undergraduate courses, develop innovative teaching

methodologies and aim to bring out students' potential and interest in a subject, among other criteria. Nominees are reviewed by the Engineering Undergraduate Studies Committee, with winners receiving a \$10,000 cash prize along with their award.

The Bechtel Foundation Engineering Teaching Excellence Awards were established in 2002. Prior to this, the School of Engineering presented Teaching Excellence Appreciation Awards to outstanding faculty members from 1994-2002.

## Campus News

### In Memory of Professor Hongjun Lu December 1945 - March 2005



Prematurely taken from us, a void remains at the Hong Kong University of Science and Technology in the place of our cherished colleague, teacher, mentor and friend, Professor Hongjun Lu, lost his fight against cancer on the evening of March 03.

A dedicated and brilliant academic respected by his peers, and a wonderful tutor viewed with equal measures of affection and reverence by his students, Prof Hongjun Lu lost his fight against cancer on the evening of March 03.

An acclaimed computer scientist, Prof Hongjun Lu was without a doubt one of the pioneers of database development in China. His desire to bring down barriers in the world was reflected in his work. Indeed, nothing could be more symbolically fitting than that this modest man, who possessed a remarkable humanity and a rare ability to nurture friendships that spanned the globe, should be remembered for helping integrate China's database systems with those of other countries.

Prof Hongjun Lu took his BSc from Tsinghua University, China and his MSc and PhD from the University of Wisconsin-Madison. His versatility knew no bounds, and after a successful spell working in the private sector at Honeywell, he moved into academia taking up a post at the National University of Singapore.

Messages of condolence for Prof Hongjun Lu have flooded into HKUST from all over the world, many of them from his former students and colleagues in Singapore. The loyalty and steadfastness of Prof Lu's character are demonstrated by the fact that he remained at NUS for over 12 years, before the call of the Motherland led him back towards China and his position at HKUST, where he joined in 1998.

Respected as he was, his expertise was also called upon by numerous organizations. He was a trustee of the VLDB Endowment, a member of the ACM SIGMOD Advisory Board (1998-2002), an associate editor of IEEE Transactions on Knowledge and Data Engineering, chair of the steering committee of the International Conference on Web-Age Information Management, and co-chair (1998-2001) and chair (2001-2003) of the steering committee of the Pacific-Asia Conference of Knowledge Discovery and Data Mining.

His generous spirit and warm nature will be deeply missed. Hongjun is survived by his beloved wife and daughter. His memory will live forever in them, and among his extended family at the Hong Kong University of Science & Technology.

## 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!**

## Highlights of Students' Achievements

**Chin Pang** of Civil Engineering received the annual Arup Best Student Award in Nov 2004, organized by Joint Structural Division.

**Yang Yin, Leung Tsz Kin, Zhao Keliang and Li Rui** of Computer Science students were ranked highest in Asia at the Regional Contest of ACM International Collegiate Programming contest 2004 held in Manila and Shanghai, respectively.

**Eric Y W Wong**, 2004 MPhil graduate, won the Hong Kong Institute of Engineers' 2005 Fugro Prize. His award-winning paper was titled "Centrifuge Modeling of Large-Diameter Bored Piles with Defects."

**Timothy Wan**, MPhil in Civil Engineering, won the "Young Engineer's Award" at the 3rd China-Japan-Korea Joint Symposium in Kanazawa, Japan. He was awarded on "Optimal Drift Design of Reinforced Concrete Buildings Under Seismic Time History Loading."






**Wong Wai Ling, Lee Kam Wah, Lam Siu Kuen and Chua Shui Ying** of 2004 UG graduates, won different awards with the Institution of Civil Engineers Hong Kong Association G&S Papers Competition 2004.

**Wan Man Pun**, PhD of Mech Engineering, has been selected for the Sir Edward Youde Memorial Fellowship 2004/2005. **Choi Sok I, Ng Kwun Pan, Lam Pik Shan, Wong Yim, Leung Ming Yan, Li Chuan Ho** of Mech Engineering have won different scholarships in 2005.

**Helen Cheng Yi Pik**, a MPhil graduate, has been offered a lectureship in soil mechanics at the University of London and commenced in March 01, 2005.

**Alan S L Chan**, a second year Dual Degree Program student managed to enter into top 20 semifinals for the "Boomer Business Plan Competition" organized by Santa Clara University. Although Alan did not make it to the top 5 finalists, the experience of competing with CEOs, entrepreneurs and students of world class universities had been immense.

## Calendar of Events

 <b>June 18, 2005</b>	<b>Hang Seng Innovative Design Competition 2004-05</b>
 <b>June 2005</b>	<b>Robocon jointly organised with RTHK</b>
 <b>July 6, 2005</b>	<b>HK Soccer Robo Cup</b> <i>ycheng@cs.ust.hk</i>
 <b>July 11- Aug 12, 2005</b>	<b>IT Enhancement Prog for gifted students</b> <i>www.cs.ust.hk/emb/basic_program.html</i>
 <b>July 22-24, 2005</b>	<b>Engineering Summer Camp for Honor Students</b> <i>www.seng.ust.hk/esc</i>

The above events are subject to change without prior notice

**In Focus** is published biannually by the HKUST School of Engineering. Its purpose is to communicate the School's developments and activities of interest to members, alumni and friends of the School. Comments, suggestions and contributions are welcomed.

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