

## Hot Competition at Engineering Summer Camp



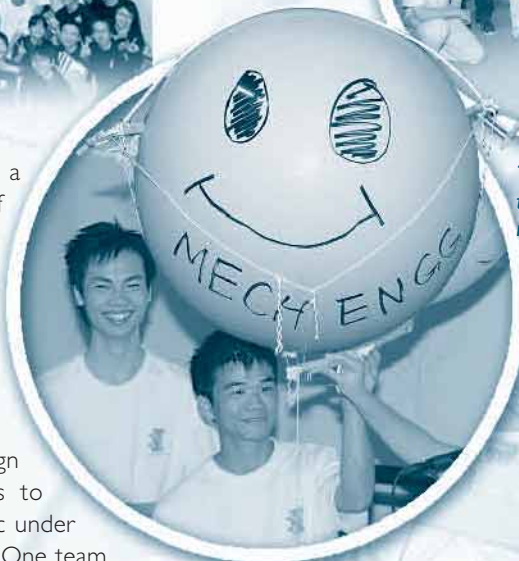
Nearly 100 outstanding Secondary Six students got a challenging taste of life as members of the School of Engineering at the Engineering Summer Camp for Honor Students 2004 in July. The three-day residential event introduced students to the different engineering fields, laboratories and facilities at HKUST and helped them meet professors and current students.

One camp highlight was the Departmental Design Competition, where students worked in teams to problem solve and develop models on a given topic under the overall theme "Engineering a Better Tomorrow". One team from each department was then selected to compete in the final on the last day.

In the overall championship awards, the Department of Civil Engineering team took most of the honors, including the Grand Prize, with their efficient model bridge. The Best Creativity Award went to the Department of Mechanical Engineering team for an airship that could fly a prescribed route and land at pre-determined places.



The Civil Engineering team won the **Grand Prize** with their efficient model bridge (top).



The airship designed by Mechanical Engineering team won the **Best Creativity Award**.



Mrs Fanny Law (left) and President Prof Paul Chu (right) shared their views about choosing a first degree with students and parents.

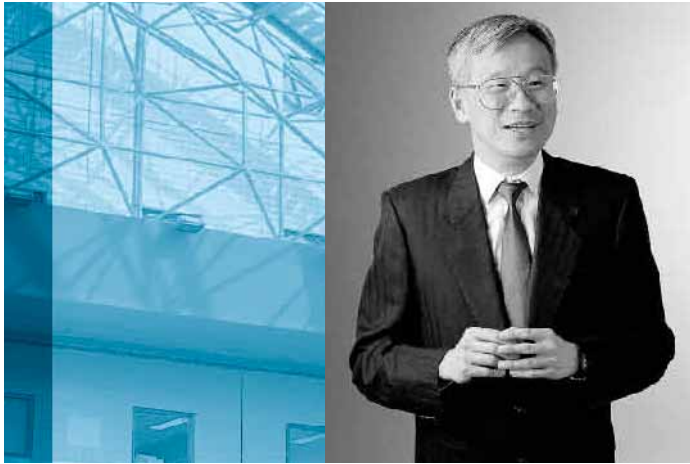
## WHAT'S INSIDE

- 2 *New Academic Appointments*
- 3 *Hang Seng Contest Inspires Innovative FYPs*
- 4 *Interns Gain Inside Story on World of Work*
- 5 *HKUST and Shenzhen Agree Closer Hi-tech Co-operation*
- 6 *Peak Time at Global Summit for Lucent Winner*
- 7 *Programs Keep Professionals Up with Emerging Technologies*
- 8 *CENG in its Element Over 10th Anniversary*

Another special event was a dinner meeting with engineering professionals, with guest speakers the Honorable Dr Sin Chung-Kai and Dr Cheng Hon-Kwan.

At the closing ceremony forum, Permanent Secretary for Education and Manpower Mrs Fanny Law pointed out there were other considerations, besides subject, when choosing a first degree. "Your interest in that subject should come first," she said. HKUST President Prof Paul Chu and Dean of Engineering Prof Philip Chan also gave advice to students and parents.

# Message from the Dean



These two, forward-looking developments give us a very good start. They offer the chance of academic and high-tech professional convergence and can provide great springboards for our faculty and students in the Pearl River Delta region and other areas of the mainland.

But we should not stop there. For example, what about looking at the possibility of setting up a HKUST campus in the Pearl River Delta? Hong Kong's population is only seven million. The Delta region has an estimated population of 47 million. Imagine the kind of opportunities that could arise from a HKUST campus there!

Of course, there would be many problems to solve before a mainland campus could become a reality but I am sure the rewards would be great. I look forward to sharing more of my thoughts on this with you in the future.

Wishing you all a happy Fall semester,

Prof Philip Chan  
Dean of Engineering

To increase HKUST's impact in mainland China, especially the regions surrounding Hong Kong, we have been looking into various ways to expand our teaching, research and service across the border.

Working with regional governments and the Fok Ying Tung Foundation, the University has established the Nansha Information Technology Park. We have also helped set up the Peking University-HKUST Shenzhen-Hong Kong Institute (Industry-Education Research).

## New Academic Appointments

### New Faculty Members

- **Prof Yunhao Liu**  
Assistant Professor; Computer Science  
PhD, Michigan State University
- **Prof Huamin Qu**  
Assistant Professor; Computer Science  
PhD, Stony Brook University
- **Prof Vincent Lau**  
Associate Professor; Electrical and Electronic Engineering  
PhD, University of Cambridge
- **Prof Rachel Zhang**  
Associate Professor; Industrial Engineering and Engineering Management  
PhD, Northwestern University
- **Prof Jeff Liu Hong**  
Assistant Professor; Industrial Engineering and Engineering Management  
PhD, Northwestern University

### New Visiting Faculty Members

- **Prof Chi Wing Fu**  
Visiting Assistant Professor; Computer Science  
PhD, Indiana University
- **Prof Jian Quan Yao**  
Visiting Professor; Electrical and Electronic Engineering  
PhD, Tianjin University

### New Adjunct Faculty Appointed

- **Prof Shen Chang Chao**  
Adjunct Associate Professor; Computer Science  
PhD, Columbia University
- **Prof Wen Gao**  
Adjunct Professor; Computer Science  
PhD, University of Tokyo
- **Prof Zhiwei Xu**  
Adjunct Professor; Computer Science  
PhD, University of Southern California
- **Prof Hong Jiang Zhang**  
Adjunct Professor; Computer Science  
PhD, Technical University of Denmark
- **Prof Ya Qin Zhang**  
Adjunct Professor; Computer Science  
PhD, George Washington University

## Hang Seng Contest Inspires Innovative FYPs



The three winning teams shared their happiness with the judging panel.

It took two months of preparatory reading and many trial experiments, but eventually Department of Computer Science students Law Wai-kong and Lai Tsz-chung started to see results in their Final Year Project (FYP) which set out to use image processing to provide a severity-level cirrhosis classification system. Indeed, their success led them to become the winners of the first Hang Seng Innovative Design Competition.

The competition, organized by the School of Engineering with the support of Hang Seng Bank Limited, encouraged students to excel in their Final Year Projects, with emphasis on the design of useful engineering applications and products. Each School department nominated one team for the final, which included a 15-minute presentation and Q&A.

The winning students' project, which involved testing with over 85 investigated cases provided by the Prince of Wales Hospital, sought a system to give preliminary diagnostic results in minutes. The system devised provided 84% accuracy for the classification "with-or-without cirrhosis" and 70% accuracy for "no, early or advanced cirrhosis". Severity information plays an essential role in cirrhosis treatment.

"It wasn't an easy task. But if you know your direction, you just have to keep going to remove the barriers," said Wai-kong, who has since undertaken further research on the project and is now a MPhil student at HKUST.

First runner-up was the Computer Engineering Department's SIP-based Video Conferencing System, with the Industrial Engineering & Engineering Management's multi-purpose Automatic Flight Control Airborne Interactive Surveillance System named second runner-up.

Mr Charles Wong, Assistant General Manager of Hang Seng Bank Limited presented the prizes at a ceremony in June, following a talk on "The Pathway of Successful Innovative Design" by Mr Samson Tam, Chairman of Group Sense (International) Limited and Chairman of the Innovation and Technology Association.



The award-winning team, Law Wai-kong (left) and Lai Tsz-chung (right), developed the first semi-automatic cirrhosis diagnosis system in Hong Kong.



Mr Samson Tam gave an inspiring talk on "The Pathway of Successful Innovative Design".



Mr Charles Wong (right) presented the prize to the second runner-up team members.



The airborne system can be used in Disneyland for entertainment and advertisement.

# Research and Collaboration

## Interns Gain Inside Story on World of Work

Monica Chow Wing Yan was involved in a major construction project. Chan Wing Yin learnt the importance of cooperation and communication as well as technical computing skills. Matthew Kwong Chung Man worked with engineers from around the world.

The three, all from different School of Engineering departments, are among the growing number of beneficiaries of the School's internship program which encourages undergraduates to investigate the working world while still at university.

Internship is currently voluntary and usually runs over two to three months in the summer or as a one-year, leave-from-study placement. Students join after completing their second year of study. They go to many different companies including Cathay Pacific, Morgan Stanley, PricewaterhouseCoopers, Motorola, HSBC, and government departments. This summer over 80 second-year Civil Engineering students undertook internships. In the Department of Computer Science, 38 have been on one-year or summer postings.

Summer intern Monica Chow, from Civil Engineering, spent 10 weeks at consulting firm Ove Arup in Hong Kong. She was assigned to a team working on a hotel development project and assisted with technical drawings. "My supervisors gave me lots of help," she said. "My best moment was when my first technical drawing was issued to the contractor."

Chan Wing Yin, Department of Computer Science, found her summer at investment bank Credit Suisse First Boston helped not only her knowledge about servers but also "softer skills" like cooperation and communication. End-of-day meetings with her mentors emphasized time management, personal responsibility and respect for others.

Recently, a trial co-op program also began with a student spending six months at a firm in the sixth semester. Matthew Kwong, Department of Mechanical Engineering, became the co-op pioneer, fitting in courses, Final Year Project and work at SAE Magnetics (HK) Ltd in Dongguan, and still graduating in three years. Working in the mainland gave him practical insight into production processes and boosted his communication skills through liaising with colleagues and customers from the US, Japan, Hong Kong and the mainland.

Lawrence Lee, School Administrator (Development), said internship was a low-risk way for companies to identify high-potential students for employment upon graduation. Students can help carry out small to medium-size improvement projects and apply the latest technology and up-to-date knowledge learnt in class to such work.

More internship opportunities are being sought through alumni and faculty contacts, and the University's R&D branch. "Internship is now a supplement to industrial training," he said. "When the situation allows, it will gradually become an alternative to satisfying the industrial training requirement for some students."



*Monica Chow (middle): "The misconception that civil engineers need to work on construction sites may put some women off. In fact, a civil engineer's role is to design and manage projects. In my internship job, for example, I stayed in the main office in Festival Walk. More than 20% there were female engineers."*



*Chan Wing Yin (second from right): "After my internship, I realized how broad the IT field was. It is not just programming. I also now understand my strengths and weaknesses. This will allow me to spend the next year equipping myself before I graduate."*



*Matthew Kwong (third from left): "Product manufacturing is not really happening in Hong Kong. You just find finished products and sales. Most technology is in the mainland. As a fresh graduate, you need to see this."*

## HKUST and Shenzhen Agree Closer Hi-tech Co-operation



Shenzhen Deputy Mayor Liu Yingli (left) exchanged the agreement with President Prof Paul Chu.



Shenzhen Mayor Li Hongzhong delivered a speech at the signing ceremony.

An agreement to further enhance collaboration in technology development and nurture senior professionals has been signed by HKUST and the Shenzhen Municipal Government.

Shenzhen Mayor Li Hongzhong headed a high-level delegation to HKUST to witness the signing of the agreement by HKUST President Prof Paul Chu, and Shenzhen Deputy Mayor Liu Yingli on June 19. Both sides have agreed to work towards faster transfer of HKUST technologies and the forging of HKUST industrial alliances with companies in Hong Kong and Shenzhen in the areas of environmental research, integrated circuits industry, smart materials, biomedicine, multimedia technology, automation, logistics and business management.

HKUST plans to establish a HKUST Shenzhen graduate school with the Shenzhen government providing active support. The school will serve as an innovative hi-tech base to nurture high-quality technology professionals. In accordance with the agreement, HKUST will also provide technology support to small and medium-sized enterprises in Shenzhen. Research institutions and technology companies in Shenzhen will be able to make use of HKUST's advanced facilities on a fee-paying basis.

The School of Engineering has concluded two additional agreements with Shenzhen companies covering integrated circuits and communications.

## Collaboration with Zhejiang Province

HKUST and the Zhejiang Provincial People's Government have established the Zhejiang Advanced Manufacturing Institute of HKUST (ZAMI-HKUST) in Hangzhou City. The collaboration agreement, signed on 16 June, marks the first time the Zhejiang provincial government has collaborated with a Hong Kong tertiary institution.

ZAMI, which started operation in August, has been launched with startup funding of 16 million RMB, a 2,000-square-meter working space, and other supportive policies from the province. The Institute will help industries in Zhejiang to upgrade their manufacturing and management capabilities, carry out research and development, promote technological exchange and build human resources. The Institute is directed by Prof Mitchell Tseng from the Department of Industrial Engineering and Engineering Management.

## International Honors and Awards

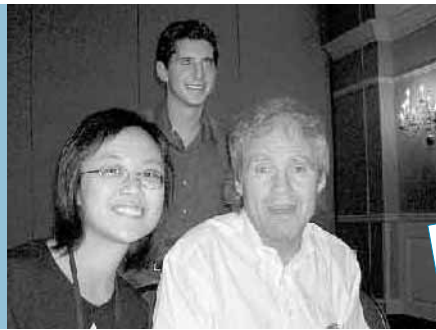
- **Prof Irene Lo** (Civil Engineering) has been selected by the Award Committee of American Society of Civil Engineers (ASCE) as the recipient of the 2004 James Croes Medal. The highly coveted and prestigious James Croes Medal was awarded to Prof Lo for her research paper on innovative waste containment barriers for subsurface pollution control that is judged worthy of special commendation for its merit as a contribution to engineering science. Prof Lo is the first Asian researcher for 15 years to receive this Award.
- **Prof Ivan Sham** (Mechanical Engineering) has been awarded a Croucher Foundation Fellowship. With the Fellowship, Prof Sham will undertake research into the mechanical behavior of biomaterials and their responses to the environment at the Biomechanics Laboratory, Free University of Berlin, Germany, for two years starting from 1 February 2005.
- **Prof W H Ki** and **Prof C Y Tsui** (Electrical and Electronic Engineering) won the Outstanding Design Award in the University LSI Design Contest organized by the IEEE Asia and South Pacific Design Automation Conference (ASPDAC) in Japan in February 2004. This novel scheme forms a key component for variable voltage supply design in low power mobile applications.

# Students and Alumni

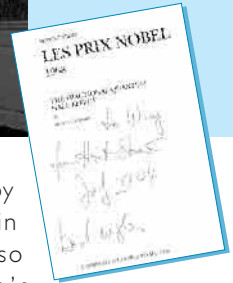
## Peak Time at Global Summit for Lucent Winner



Wing Shan (right in the front row) and her teammates explored New York City in leisure time.



Wing Shan (left) was excited to obtain the autograph of 1998 Nobel Prize winner in Physics Prof Horst Stormer (right).



Summer proved an exciting time for School of Engineering undergraduate Chan Wing Shan when she became the only Hong Kong student to receive the 2004 Lucent Global Science Scholars Award for excellence in science and mathematics and join a week-long summit at Lucent Technologies' headquarters in New Jersey.

Wing Shan, who recently started her second year on the Technology and Management dual degree program, said: "I was really excited about going to Bell Labs, as it is such a famous place for research."

The Global Science Scholars Summit, held in July, brought together 55 young scholars from around the world. During the week, Wing Shan's team of six, comprising students from the US, South Korea and Saudi Arabia, explored plastic electronics. They shadowed the Bell Labs scientist researching this area and

gave a presentation. The seminar by the 1998 Nobel Prize winner in Physics Prof Horst Stormer also deeply inspired Wing Shan's enthusiasm in scientific research. Leisure activities included touring New York City, a Manhattan cruise dinner, and a Broadway show.

Wing Shan chose a dual degree majoring in Electronic Engineering and General Business Management because she felt business skills would be useful in her future engineering career. "Studying the two disciplines is really enjoyable as I can interact with different people every day and see how the two groups view issues. Business studies also give me a lot of training in interpersonal skills and presentations. These are important even in a technical environment. My wider perspective may help later promotion prospects too."

## Students' Robots Take on Romantic Challenge

Three School of Engineering undergraduate teams – U-Shaped Turkey, Turkey Superior Union and Altair – represented HKUST at the Robocon 2004 Hong Kong Regional Robot Competition in June.

The contest theme, "Reunion of Separated Lovers", was based on a well-known Asian legend, with contestants asked to build machines that would reunite two lovers, "Cowherd" and "Spinning Damsel", by completing the "Bird Bridge" and carrying the "Golden Gift" from one zone to the other.

The HKUST entries were created by students from the Departments of Electrical and Electronic Engineering, Mechanical Engineering and Computer Science.

"We are proud of our students," said project co-ordinator Judy Wong. "They completed all the robots themselves, from buying materials from Shanghai Street to programming the special functions for each machine."

Sam Wong, U-Shaped Turkey team member, added: "Looking back, there were many obstacles, but the synergy among students allowed us to overcome all these challenges, one after the other."



## Highlights of Student Achievements

- Civil Engineering students won the HKIE Geotechnical Division student prizes: Best Performance in Geotechnical Engineering Subjects – **Tong Wing Sze**.

Best Final-year Geotechnical Project Award – Winner: **Lee Wai Hang** with his project “Centrifuge and Numerical Modelling of Single Jacked-in Pile in Dense Sand”. First runner-up: **Chung Yee Man Ivy** with her project “Influence of Sleeved Pile on the Stability of Retaining Wall”.

- The Final Year Project of **Tang Man Wai** (left) and **Wu Sui Hin** (right) (Computer Engineering) “PDA-based Tour Guide and Planner for Hong Kong” has won the Best Project Idea Award and Certificate of Distinction in the Intersarsity Internet Technologies Exposition and Conference (IITEC) 2004.



- **Thong Wang Fai** (Civil Engineering) won the First Prize for the best paper from HKIE Materials Division in May 2004, with his thesis “Resistivity Measurement for Cement-based Materials”.

- **Zhang Lei** (PhD, Computer Science) has received the Best PhD Paper Award of the 5th ACM Postgraduate Research Day, with his presentation “Provisioning Virtual Private Networks in the Hose Model with Delay Requirements”.

- **Tang Jiqing** (MPhil IEEM), **Leung Tsz Kin** (COMP) and **Wong Long Sing** (CEG) won the champion of the ACM Local Programming Contest 2004. This is the second time for HKUST to win this competition since 1992.

- **Lai Hon Keung** (left) and **Yu Piu Yan** (right) (Mechanical Engineering) won the President’s Cup with their project “A New Coolant Cavitation Generator for Precision Machining of Silicon Based Brittle Materials”.



## Continuing and Professional Education

### Programs Keep Professionals Up with Emerging Technologies

Two new Master’s programs are being launched to keep professionals and local and overseas graduates up-to-date with the latest developments in the engineering world.

The **MSc in Mechanical Engineering** offers an opportunity to acquire the technological understanding to design, select materials for and manufacture various electrical, mechanical and thermal systems and their components.

The full-time program, which can be completed in 12 months, is aimed at fresh graduates from Hong Kong, those returning from overseas and mainland students. The part-time program, which takes from two to two-and-a-half years, gives practicing professionals the opportunity to update their knowledge.

“The main difference with our program is the incorporation of emerging technologies,” said program director Prof Jang Kyo Kim, Associate Professor in the Department of Mechanical Engineering. “This includes advanced materials, micro-electro-mechanical systems (MEMS), robotics, CAD/CAM, electronic packaging and precision engineering. These are department strengths.” The first intake will be in late January 2005, with an information session in November 2004.

The two-year, part-time **MSc in Electronic Engineering** provides a broad view of the dynamic technologies that are changing ways of work and interaction in today’s globalized world. Courses include signal processing, communication and computer networks, control, photonics, and display technologies.

Program director Prof Bertram Shi, Associate Professor in the Department of Electrical and Electronic Engineering, said: “Nowadays, technology is advancing across such a broad range of areas, technical professionals need a multi-disciplinary perspective.” Students can also customize the curriculum to suit their needs with courses from other programs, such as Telecommunications and IC Design Engineering, he said.

The first part-time intake is late January 2005. A full-time program is due to start in Fall 2006.

For further details on both MSc programs, contact May Lui, Office of the Dean of Engineering, on tel (852) 2358-6966.

## Campus News

### CENG in its Element Over 10th Anniversary



Prof Po Lock Yue raised a toast at the banquet.

Students, alumni and faculty were delighted to see CENG celebrated its 10th anniversary.



Enthusiastic reactions were the order of the day on August 28 when the Department of Chemical Engineering, the only such department in Hong Kong, celebrated its 10th anniversary. A series of successful events at HKUST brought together industrialists, academics, faculty and students, with more than 100 alumni also returning to catch up with friends and professors.

A symposium on 'Chemical Engineering in Asia: Education, Research & Development' saw eminent members of the chemical engineering field from around the world take part. Speakers included Prof Xianghong Cao, President of the Chemical Industry and Engineering Society of China and Senior Vice-President of SINOPEC; Prof Masanobu Hasatani, President of the Asia Pacific Confederation of Chemical Engineering; Prof Jinghai Li, Vice President of Chinese Academy of Science and Dr Robin Batterham, Chief Scientist, Australia, and President of the UK Institution of Chemical Engineers.

Alumni held a forum on job opportunities and graduate studies, followed by a more relaxing three-on-three basketball competition.

Other highlights included a poster display showcasing CENG faculty's research achievements over the past decade and the launch of the Sustainable Excellence Fund, supported by Prof K M Ng, current Head of Department, and Prof Po Lock Yue, Founding Head. "We have made a good beginning," they said, in a letter to alumni, "but the challenges have only just begun."

### Don't be the Missing Link ...

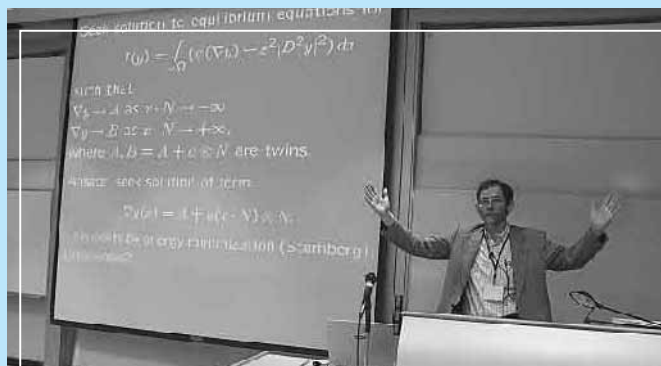
Alumni relationships are invaluable assets to the School and alumni. To foster the growth of our alumni network, please keep us informed of your recent news and send us your updated contact information via email to [seng@ust.hk](mailto:seng@ust.hk).

**Stay connected and keep in touch!**

### IUTAM Symposium

The Department of Mechanical Engineering hosted the International Union of Theoretical and Applied Mechanics (IUTAM) Symposium on "Size Effects on Material and Structural Behavior at Micron- and Nano-scales" at HKUST from 30 May to 4 June.

The IUTAM symposium was chaired by Prof Qingping Sun and brought together 40 international scientists from the fields of material science, physics and mechanics to discuss topics such as behavior of structures at micron- and nanometer-scales, physical bases of size effects, adaptive and multi-functional behavior of materials at small scales and size effect in fracture and phase transformation of solids. Fellow of the Royal Society and President of the International Mathematical Union Prof John M Ball, from the University of Oxford, also gave a lecture at the event. Various IUTAM symposia are organized each year by different host institutions of high academic standing.



A lecture from Prof John M Ball.

## Calendar of Events



**Dec 20-22** The 15th International Symposium on Algorithms and Computation (ISAAC 2004)

All titles and dates are subject to revision.

**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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