

SENG Shines at 11th Congregation



Celebrations were in order for School of Engineering (SENG) students when nearly 1,000 from the School were presented with academic degrees at the University's 11th Congregation in November.

Of those graduating from SENG, 660 gained Bachelor's degrees, 242 gained their Master's degrees and 50 gained doctorates. Some 2,632 HKUST students received degrees in all.

In addition, eight of the 15 students gaining academic achievement awards at the Congregation came from School. Those recognized for their studies were Cheung Pak Ming (COMP), Ip Tak Shun (COMP), Ma Wing Kui (CENG), Qi Xiali (ELEC), Siu Po Wa (COMP), Tang Kam Lun (COMP), Tong Lap Ki (COMP) and Wang Ying (CPEG).

Dean of the School of Engineering Prof Philip Chan said: "I feel proud that our students have done so well and expect they will contribute greatly to Hong Kong's economic development."



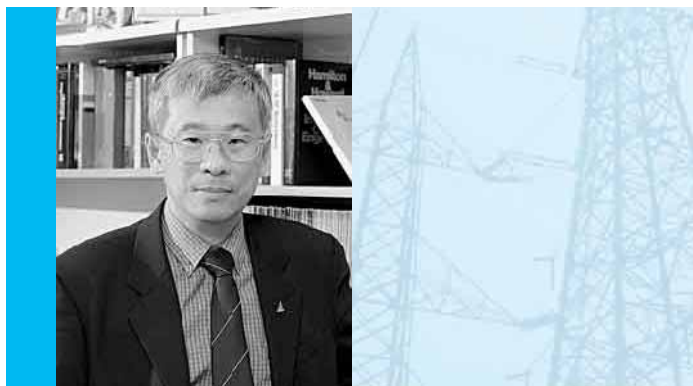
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Outreach Day Attracts Thousands

Thousands of prospective students explored all aspects of HKUST during our 2003 Outreach Day, which was held on 20 September. A series of seminars was organized to provide information about HKUST's wide-variety of courses and campus life. Display booths, teaching laboratories, and computer rooms were crowded with students who were eager to find out more about our high-quality learning and teaching facilities.

Message from the Dean



Recently, the University Grants Committee asked all eight tertiary institutions in Hong Kong to update their mission statements. In addition to HKUST's goal for teaching, research and service, the University's mission statement also contains the distinctive words, "to assist the economic and social development of Hong Kong by nurturing the scientific, technological, and entrepreneurial talents who will lead the transformation of traditional industries and fuel the growth of new high-value-added industries for the region".

This is indeed a significant part of the University's mission. The School of Engineering will play an important role in helping to fulfil this and

we will be glad of all assistance and encouragement from our alumni, faculty and friends.

To support entrepreneurship activities, I am pleased to let you know that the Government has approved the Enterprise Center. This will be an extension to the Academic Complex towards the south end of the campus and is due to be completed by the end of 2006 / early 2007.

On the budget front, the Heads of Universities Committee has agreed to the Government's proposal of a "0-0-0"/ "0-0-5" funding model for the next triennium of 2005-08. With the budget situation settling, the University should be able to move ahead and formulate the budget plans to cope with the funding arrangements.

With warmest regards,

Prof Philip Chan
Dean of Engineering

New Academic Appointments



Prof Irene Lo
Associate Director of the Environmental Science and Engineering Program

Prof Lo, Associate Professor of Civil Engineering and Associate Director of Environmental Engineering Program, was appointed as Associate Director of the Environmental Science and Engineering Program in December 2003. Prof Lo received her PhD from the University of Texas at Austin. She is a chartered engineer of HKIE in the Environmental, Geotechnical and Civil disciplines.

New Visiting Faculty Members

- **Prof Kathy Qian Luo**
Visiting Assistant Professor; Chemical Engineering
PhD, University of British Columbia
- **Prof Chi Kong Yeung**
Visiting Assistant Professor; Chemical Engineering
PhD, University of Bradford
- **Prof Andrejs A Koliskins**
Visiting Associate Professor; Civil Engineering
PhD, Leningrad University
- **Prof Zhenhua Huang**
Visiting Assistant Professor; Civil Engineering
PhD, Massachusetts Institute of Technology
- **Prof Saif Benjaafar**
Visiting Professor; Industrial Engineering and Engineering
Management
PhD, Purdue University

Pioneering Degree to Boost Bio-devices

The Department of Chemical Engineering will offer the first undergraduate program in Hong Kong and the region to combine studies in bioscience and product engineering from the start of the 2004-2005 academic year.

The new BEng in Chemical and Bioproduct Engineering (CBPE) will link the two fields by focusing on the design and manufacturing of biochemical products and bio-devices. The biosciences have recently been responsible for major scientific advances while product engineering is a new research area transforming scientific discoveries into functional products.

"Product engineering has emerged as a leading area of research and education, with many US universities introducing product engineering into their curricula," said Prof Ka Ming Ng, Head of the Department of Chemical Engineering.

"Students will acquire knowledge of the design and processing of chemicals and bioproducts. As the biochemical engineers, bioprocess engineers and quality engineers of the future, their skills will be highly sought after in the biotechnology, pharmaceutical, food and beverage and traditional Chinese medicine (TCM) industries both in Hong Kong and throughout the region," he said.

Details of the CBPE program can be found at <http://www.ceng.ust.hk/>

Professors Prove Winners in the Lecture Hall

The School of Engineering faculty have shown their top classroom skills with five professors honored for their teaching excellence in two sets of awards.

Assistant Professors Ben Young and **Dennis Tong**, of the Civil Engineering Department and Electrical and Electronic Engineering Department respectively, were selected for the Bechtel Foundation Engineering Teaching Excellence Award 2002-03, given by the School for outstanding performance in the teaching of undergraduate courses. Both professors said they were honored to be chosen for the award.

According to Prof Ben Young, there are seven "musts" for good teaching: a heart for students, preparation time for lectures, good presentation, the ability to make students think, two-way communication, feedback from students and always thinking of ways to improve. "I consider teaching as important as research," he said.

Two essential qualities are patience to cope with different learning capacities among students and concern for students' welfare, he said. For new courses, Prof Young spends 10-14 hours preparing for each hour of lecture, and takes up to an hour reviewing lecture materials before class.

To assist presentation, Prof Young has carried out research for a University-funded teaching innovation project on three-dimensional visualization and simulation of structures to enhance students' understanding of abstract concepts.

Prof Dennis Tong also said links between theories and applications gave students a clearer overview of what they were learning. "Students will take a more active role in the learning process once they identify topics or applications of interest to them."

In the Best 10 Lecturers Award 2003-04, elected by HKUST undergraduates, three School of Engineering professors won awards. They included **Associate Professor Andrew Horner**, Department of Computer Science, who was delighted to be selected for the fifth time.

"I've learned to put my students first in my priorities, an essential shift in attitude from my early days as an introspective researcher," said Prof Horner. "Putting my students first drives all the essential qualities of a caring teacher, such as attentive listening, ability to stimulate enthusiasm, and innovation."

The other two winners were **Assistant Professor Vincent Poon**, Electrical and Electronic Engineering Department, and **Associate Professor Long Quan**, Department of Computer Science.



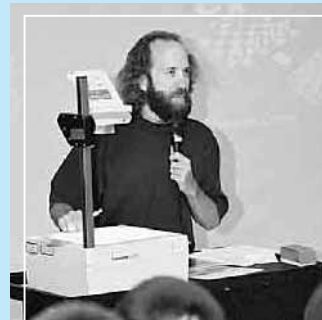
Prof Ben Young
Bechtel Foundation
Engineering Teaching
Excellence Award

"A good teacher must always have a positive attitude towards improving their performance."



Prof Dennis Tong
Bechtel Foundation
Engineering Teaching
Excellence Award

"The most enjoyable part of teaching is seeing keen students grow better with each lecture."



Prof Andrew Horner
Best 10 Lecturer

"I've learned to put my students first."



Prof Vincent Poon
Best 10 Lecturer

"I always try to see and think from the students' angle and ask if my voice, notes, presentation techniques, examples, course plan and management help them to study effectively, and with interest."



Prof Long Quan
Best 10 Lecturer

"Teaching is just like learning. One needs to be serious, diligent, and to have a good attitude."

University Extends Collaboration with Chinese Academy of Sciences

HKUST Department of Computer Science and the Chinese Academy of Sciences (CAS) have arranged to further boost collaboration in information technology research and postgraduate training.

The agreement between the two renowned institutions was signed by HKUST President Prof Paul C W Chu, HKUST Vice-President for Academic Affairs Prof Yuk Shee Chan, CAS Vice-President Prof Chunli Bai and Executive Vice-President of CAS Graduate Institute Prof Wen Gao on 22 December 2003.

A joint pervasive sensor workshop will be held in Wuhan in October 2004 to look at issues related to overall system infrastructure, video camera surveillance, networking, plan recognition and query processing. Findings from this project may be used to improve environmental recorders, traffic monitoring systems and healthcare services for senior citizens.



President Prof Paul Chu presented a souvenir to Prof Chunli Bai (right) at the collaboration signing ceremony.

International Honors and Awards



- **Prof Wilson Tang** (Civil Engineering) was given Honorary Membership in May 2003 for his significant contributions to the safety and reliability analysis of civil engineering, with emphasis on application to geotechnical systems. Honorary Membership is the highest honor awarded by the American Society of Civil Engineers (ASCE).
- **Prof Hong Kam Lo** (Civil Engineering) and 2003 PhD graduate **Dr W Y Szeto** have claimed the Outstanding Paper Award at Eastern Asia Society for Transportation Studies (EASTS) biannual conference, held in Japan from 29-31 October 2003. Their work, "Time-Dependent Transport Network Design: A Study on Budget Sensitivity", was one of the three papers to receive the award out of 600 papers submitted.
- **Prof Ka Ming Ng** (Chemical Engineering) has been elected a Fellow of the American Institute of Chemical Engineers (AIChE) in recognition of his significant contributions in chemical engineering.

- **Prof V G Chigrinov** (Electrical and Electronic Engineering) and co-workers received the "Outstanding Poster Paper Award" in the 10th International Display Workshops (IDW) for their work "New Optical Method of Liquid Crystal Shear Viscosity Measurements." IDW is one of the influential conferences in the area of display technology, annually held in Japan.
- A paper by **Prof. Pengcheng Shi** (Electrical and Electronic Engineering), coauthored by **Dr Huafeng Liu** (postdoctoral research associate), has been awarded the biannual best paper prize by the Board of Information Processing in Medical Imaging, the longest running and prestigious medical imaging conference in the world. This paper is about a meshfree particle method for heart motion analysis.
- A paper by **Prof Raymond Cheung** (Industrial Engineering and Engineering Management), "A Time-window Sliding Procedure for Driver-task Assignment with Random Service Times", has received the Best Paper Award for IIE Transactions on Scheduling and Logistics for 2002-03.
- A paper by **Prof Fugee Tsung** (Industrial Engineering and Engineering Management), "The Dynamic T2 Chart for Monitoring Feedback-controlled Processes", has received the Best Paper Award for IIE Transactions on Quality and Reliability for 2002-03.
- **Prof Mitchell Tseng** (Industrial Engineering and Engineering Management) was appointed as Honorary Adjunct Professor of Management in the Business School at the Technical University of Munich (TUM) in October 2003. He was also awarded the Distinguished International Research Fellowship by the University of Calgary in 2003.

Password Cracking System to Help Police

The Cyberspace Center has developed an advanced Password Cracking System to assist the Hong Kong Police Force in crime investigations.

The new system helps recover the password used to encrypt a file and is expected to become an important forensic tool. Common file formats such as Microsoft Word, Excel and Acrobat PDF are supported.

To reduce the time required to crack a password, the system adopts a scalable cluster-based architecture. This consists of a network of 16 collaborative, high-end computers, which search in parallel for the unknown password. By using optimized program code for fast

computing and distributing the load dynamically among computers within the cluster, the system can check over two million passwords per second and recover a seven-character password within 18 days. By adding more computers to the cluster, performance can be further improved.

The Cyberspace Center, established in 1996 and operated under the Department of Computer Science, is a research, development and service unit that helps local businesses and industries to make more effective use of the Internet to improve their competitiveness. Other Internet technologies and applications under investigation at the Center include network security, electronic commerce, intranet and smart card technology.

Students and Alumni

Let Them See Light at the End of the Tunnel: Undergraduate Research

The importance of research in School of Engineering programs was highlighted recently when two students in the Department of Electrical and Electronic Engineering and their final-year project were featured in RTHK's 13-part television series *The Undergrads*.

The series of short programs showed students' lives at local universities with Keung Chi Wing and Ng Kar Wei demonstrating their pursuit of knowledge and innovation in engineering at HKUST. The pair carried out research on "Color Mixing Using Light-Emitting Diode (LED) Chips", under the supervision of Prof Kei May Lau, with the students finding their independent studies resulted not only in more knowledge but increased their skills in problem-solving and motivation to learn.

Chi Wing told *In Focus*: "It was really interesting searching through books and papers myself and very different from learning directly from lecturers. In fact, it was so interesting that sometimes I got side-tracked and learnt many other things about related topics, a great way to expand my knowledge base."

Both students said the most difficult part had been learning how to handle the LED chips themselves as each one is just the size of a speck of dust.

Kar Wei said: "Doing research for my undergraduate degree was really challenging, but will be extremely important for my future studies and career."

Prof Lau said that a combination of talent, attitude and perseverance enabled the students to be successful in their research. "Such hands-on experience is invaluable and irreplaceable by textbook and classroom learning. In addition,

they found out how their work and innovation can be applied to everyday life."

Regarding their selection by RTHK, Prof Lau said: "They are both energetic and multi-faceted, not bookworms or nerds, and can present themselves very well."

To view the program, please visit

<http://www.rthk.org.hk/rthk/tv/undergrads/20040118.html>



Using LED display panels in advertising has become very popular.



Under the guidance of Prof Kei May Lau (middle), Ng Kar Wei (left) and Keung Chi Wing (right) have demonstrated great enthusiasm for LED research.

Setting the Pace with **New York Career**



Gregory (left) and another MPhil graduate Jeff (right) with Prof Papadias.



Gregory enjoyed himself in a snowboarding trip.

Last summer certainly proved to be an eventful one for Gregory Fu Chung Yin (BEng CPEG 2002). In July 2003, he gained his MPhil degree from HKUST. A month later, he was starting a high-flying career with JPMorgan Chase in New York.

"I always wanted to get international working experience," said Gregory, who carried out his graduate research under the supervision of Associate Professor Dimitrios Papadias, Department of Computer Science. "Only by seeing different parts of the world can you broaden your horizons."

His job as an application delivery analyst involves enhancements for equities front office trading application programs, day-to-day production support for applications and problem-solving. But the qualities that are particularly important, according to Gregory, are "good communication and interpersonal abilities, and risk and crisis management skills, since the job is business and time critical".

His many activities at HKUST helped prepare him for this. These included being vice-chairperson of the CPEG Students' Society, external secretary for the Student Astronomy Club, School of Engineering representative to the Students' Union Council and general secretary of the Joint Universities Ball Organizing Committee.

"Through my experience of organizing events and managing different teams, I was able to learn the importance of effective communication and leadership skills," Gregory said. "Every business consists of a team of people and any firm with vision wants to hire people with the potential to be a leader. Leadership is very hard to learn from textbooks but much easier to learn from real experience. HKUST provided that opportunity."

In the future, Gregory is thinking about an MBA and working in London, Tokyo and back in Hong Kong. "I don't intend to stay in one place forever. I do wish to stay in the financial industry," he said.

High Performance in **ACM Programming Contest**

Teams from the Department of Computer Science (CS) proved to be among the top performers at the regional contests of the Association for Computing Machinery (ACM) International Collegiate Programming Contest 2004.

The regionals took place in Guangzhou and Manila with two HKUST computer science teams competing at each location. The contest requires participants to use creativity, teamwork and innovative thinking to build new software programs within a certain time limit.

CS students came third and 17th out of a total of 67 teams in Guangzhou and fourth and sixth out of 66 teams in Manila.

The ACM International Collegiate Programming Contest was founded in 1970 to assist the development of top students in the computer science field. The competition comprises four different rounds: local, preliminary, regional and world finals.



CS teams achieved good results at the Manila (top) and Guangzhou (bottom) contests.



PhD Graduates Win Young Scientist Honors

PhD graduates Dr Alex Leung Ka Nang, Department of Electrical and Electronic Engineering, and Dr Jiangchuan Liu, Department of Computer Science, have both been recognized for their research in the 2003 Young Scientist Awards at the 11th Annual Conference of the Hong Kong Institution of Science (HKIS).

Dr Leung, who received his PhD in 2002 under the guidance of Prof Philip Mok and is currently a Visiting Assistant Professor in the Department of Electrical and Electronic Engineering at HKUST, gained the Engineering Science award for his project on power-management integrated-circuit design.

"It provides a solution to future system-on-chip designs in wireless and telecommunication handheld equipment," Dr Leung explained. Such work can significantly reduce production costs and at the same time offer better performance than many commercial products. His idea has been presented at the International Solid-State Circuits Conference (ISSCC) in 1999, which is the top conference in the integrated-circuit design area.

Dr Liu gained a certificate of recognition for his pioneering work in adaptive video multicasting over the Internet and wireless networks. He studied for his PhD in Computer Science under the supervision of Prof Bo Li. "I would like to thank the Department and University for providing the best research and study environment and thank the professors for their tremendous help in the past four years," Dr Liu said.

Dr Liu received his BEng in Computer Science from Tsinghua University. He is now an Assistant Professor in the Department of Computer Science and Engineering at the Chinese University of Hong Kong.



Dr Alex Leung (left)
with his PhD advisor
Prof Philip Mok.

Highlights of Student Achievements



- **Guimei Liu** (left) and **Zemin Ding** (right) (PhD, Computer Science) were awarded Microsoft Research Asia Fellow 2003. The award presentation ceremony was held on 5th November 2003 in Beijing.
- Several Civil Engineering students won the Institute of Civil Engineers - Hong Kong Section (ICE-HK Section) paper competition 2003:
Geotechnical Discipline - **Leung Shun Cheong** (Best Paper Award); *Environmental Discipline* - **Lam Ka Man** (Best Paper Award); **Poon Wing Chi** (Merit Award); *Highways, Railways and Transportation Discipline* - **Leung Kin Man** (Merit Award).
- The paper presented by **Hoi Lee** (PhD, Electrical and Electronic Engineering) "Active-Feedback Frequency Compensation for Low-Power Multi-State Amplifiers" was selected to receive the Conference's first Best Student Paper Award at the last IEEE Custom Integrated Circuits Conference (CICC).

- **Alexandra Wong Lung Ngong** (MPhil graduate, Electrical and Electronic Engineering) won the second prize at the Challenge Cup - the National Collegiate Research Competition - in November 2003 with her project "An Image Analysis Approach to Early Diagnosis of Ischemic Heart Diseases". This competition is organized by the Ministry of Education, the China Science Association, the National Youth League, and the National Student Union.
- **Chan Yuen Han** (Industrial Engineering and Engineering Management) has been selected for the award of HKIE Scholar 2002-03. This is a three-year scholarship program awarded to a maximum of three first-year engineering undergraduate students every year to recognize their outstanding academic achievements.
- **Chan Yu Hin** (PhD, Mechanical Engineering) won the Best Student Paper Award at the International Symposium on Electronic Materials and Packaging (EMAP 2003) held in Singapore, for his presentation on "Influences of Plasma Cleaning, High Frequency and Substrate Material on Process Windows of Au Wire Bonding."
- The Final Year Project of **Wong Chung Wai** (Mechanical Engineering), "Performance Test of Direct Methanol Fuel Cell", has been awarded the 2003 Best Final Year Project Award - Second Place - by the American Society of Mechanical Engineers (ASME).

Campus News

Advanced Materials Workshop Looks to the Future



More than 200 scientists, engineers and research managers from Mainland China, Taiwan, Hong Kong, Japan and France gathered at HKUST in December for the 2003 Workshop on Advanced Materials Development Trends and the Future. The successful event, organized by HKUST and the Chinese Materials Research Society, focused on the direction of materials engineering, including microelectronic, nanostructured and magnetic materials, among others. The workshop ran from 20-24 December 2003.

CPEG Accreditation by HKIE

The Computer Engineering Program (CPEG) has been granted a 5-year accreditation period by the Hong Kong Institute of Engineers (HKIE) starting from the academic year 2004-05. This is the maximum period that HKIE can grant to any university program and it is the second time in a row that CPEG has been granted a 5-year accreditation period.

This is an indication of the high quality of our program, students, faculty, school and University. In order to get this stamp of approval from HKIE, the CPEG program was rigorously evaluated by experts from both academia as well as industry. The evaluation covers numerous aspects including curriculum development, students, faculty, industrial training, and professional development. The accreditation team highly praised our program in all aspects.

Don't be the Missing Link ...

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

Stay connected and keep in touch!

Close Encounter with Astronaut Liwei Yang

Mechanical Engineering student Johnny Kwong Kwing Lam was one of the ten HKUST students invited to the City Hall lunch held in honor of China's Astronaut Liwei Yang on 3 November 2003. He was selected to sit next to the Astronaut.

Yang's devotion to his career inspires many people, including Johnny. "His abilities and determination are unbelievably strong," said Johnny. "While he kept concentrated on his training programs, he lost a lot of treasured moments with his family." As a final-year Engineering student, Johnny believes that teamwork and effective communication are the basic elements for success.



Liwei Yang (left) impressed Johnny Kwong (right) with his ability and determination.

Calendar of Events



Apr 14-15

**China at the Crossroad of the
Global Supply Chain**



Jul 25-26

**2004 Conference on Empirical
Methods in Natural Language
Processing (EMNLP 2004)**

(Enquiry: dekai@cs.ust.hk,
<http://www.cs.ust.hk/~dekai>)

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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