

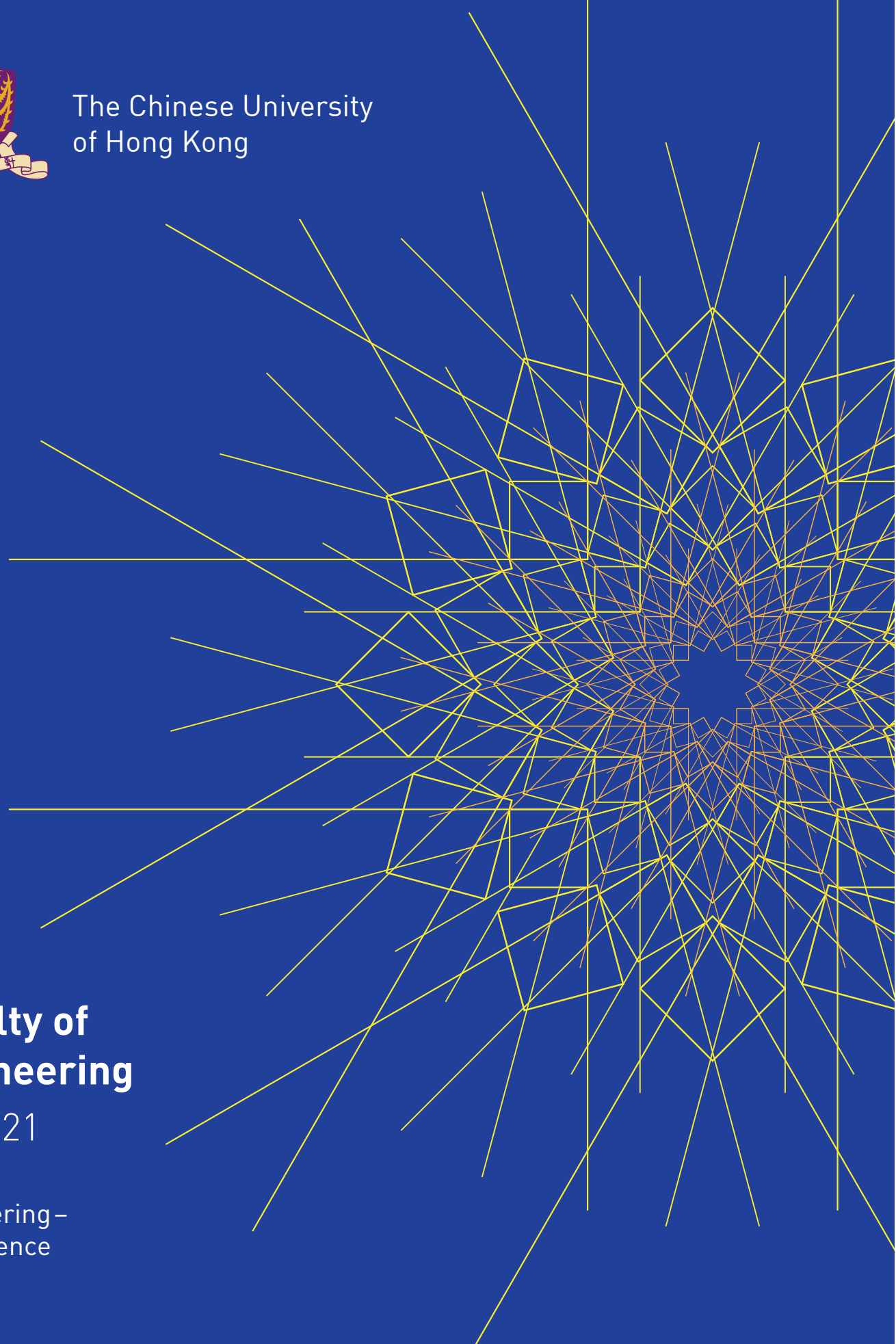


The Chinese University
of Hong Kong

Faculty of Engineering

2020-21

Engineering –
the Essence



CUHK

Founded in 1963, CUHK is a leading comprehensive research university committed to research and education excellence with a global reputation. Located in the heart of Asia, CUHK has a vision and a mission to combine tradition with modernity, and to bring together China and the West. Under the University's unique collegial system, the programmes and activities offered by its nine colleges complement the formal curricula by delivering whole-person education and pastoral care. The University has eight faculties: Arts, Business Administration, Education, Engineering, Law, Medicine, Science, and Social

Science. Together with the Graduate School, the University offers over 300 undergraduate and postgraduate programmes. All faculties are actively engaged in research in a wide range of disciplines, with an array of research institutes and research centres specialising in interdisciplinary research of the highest quality.

CUHK is recognised as the most innovative university in Hong Kong and 22nd in the Asia-Pacific by Reuters' Asia Pacific's Most Innovative Universities. The list identifies and ranks educational institutions which are

doing the most to advance science, invent new technologies, and power new markets and industries. The rankings are determined by the innovative capacity and achievement of the universities. The University houses a number of research institutes and organisations dedicated to the advancement of sustainable development, including Institute of Environment, Energy and Sustainability, the Institute of Future Cities, and the Jockey Club Museum of Climate Change.

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Dean's Words

Engineering: Shaping the future, Creating endless possibilities

Founded in 1991 by our former Vice-Chancellor Late Prof. Charles Kao, also known as the "Father of Fiber Optics" and Nobel Laureate in Physics, the Faculty of Engineering comprises world leading experts who are at the forefront of their disciplines and commit to teaching and research excellence.

The Faculty provides innovative education to our engineering students. Currently with more than 2,300 undergraduate and graduate students, we offer a wide spectrum of academic programmes in artificial intelligence: systems and technologies, biomedical engineering, computer science, computer engineering, electronic engineering, energy and environmental engineering, financial technology, information engineering, mathematics and information engineering, mechanical and automation engineering, and systems engineering and engineering management. To enrich students' learning experiences, we provide a variety of ways to engage students in learning such as hands-on experiences, exposure to engineering entrepreneurship, field trips, international exchange, undergraduate summer research internship and placement.

The Faculty has been well recognized internationally for its excellence in engineering research. Our world-class laboratories and facilities enable excellent research to be carried out. We have been working closely with government and industry for developing new technologies to meet the societal needs and improve the quality of mankind. About 30 years ago, CUHK was the pioneer in Hong Kong's internet infrastructure and development. The fact that over 80% of today's internet traffic in Hong Kong still routes through CUHK's communication equipment is a testimony and legacy of our pioneering and continuing contributions to Hong Kong. Today, Artificial Intelligence (AI) is poised to transform every aspect of our lives. The immense success of the startup SenseTime, the first Unicorn in HK, highlights our leadership position in the area of AI. On international rankings in Engineering, we are among the best in the world. Reuters named CUHK as the most innovative university in Hong Kong in the past 4 years.

The industrial revolution and the information age have changed the course of history. Engineers shoulder growing responsibilities for the betterment of mankind. We are now at the beginning of the "Fourth Industrial Revolution", fusing the physical, digital and biological worlds. The convergence of the Internet of Things, Artificial Intelligence, robotics, data science, biotechnology, materials engineering, microelectronics, autonomous vehicles, advanced manufacturing, and nanotechnology are poised to disrupt every industry and every aspect of modern life. CUHK Engineering must work together with other Faculties to play a key role in shaping the Fourth Industrial Revolution. In the years ahead, we will continue to strengthen our teaching and research excellence, as well as responding to the grand challenges facing the world.

In this brochure, you will find information about our Faculty's figures, professors and students' achievements, programmes and curriculum and students' sharing. On top of that, you are more than welcome to talk to our students, teachers or visit the facilities when you have the chance.

Prof. Martin D.F. Wong
Dean of Engineering

Faculty of Engineering

Faculty Mission

The Faculty is committed to the education of future leaders in engineering, the pursuit of knowledge at the frontier of modern technology, and the application of technology to meet societal and human needs. In both teaching and research, the Faculty is guided by the highest international academic standards.

There are six departments in the Faculty of Engineering:

- Biomedical Engineering
- Computer Science and Engineering
- Electronic Engineering
- Information Engineering
- Mechanical and Automation Engineering
- Systems Engineering and Engineering Management

Degree Programmes

The Faculty currently offers the following bachelor, master, and doctoral degree programmes:

Bachelor of Engineering

- Artificial Intelligence: Systems and Technologies
- Biomedical Engineering
- Computer Engineering
- Electronic Engineering
- Energy and Environmental Engineering
- Financial Technology
- Information Engineering
- Mechanical and Automation Engineering
- Systems Engineering and Engineering Management

Bachelor of Science

- Computer Science
- Mathematics and Information Engineering

Double Degree Option

- Engineering and Business Administration*

* The Engineering and Business Administration Double Degree Option is jointly offered by the Faculty of Engineering and Faculty of Business Administration. Please refer to P.40 for programme details.

Master of Science

- Biomedical Engineering (full-time/part-time)
- Computer Science (full-time/part-time)
- E-Commerce and Logistics Technologies (full-time/part-time)
- Electronic Engineering (full-time/part-time)
- Financial Technology (full-time/part-time)
- Information Engineering (full-time/part-time)
- Mechanical and Automation Engineering (full-time/part-time)
- Systems Engineering and Engineering Management (full-time/part-time)

Master of Philosophy & Doctor of Philosophy

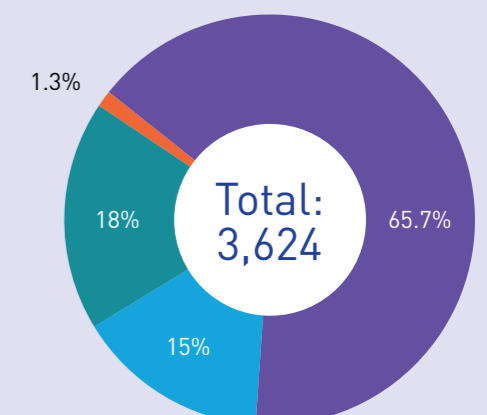
- Biomedical Engineering
- Computer Science and Engineering
- Electronic Engineering
- Information Engineering
- Mechanical and Automation Engineering
- Systems Engineering and Engineering Management

Facts and Figures

Students (2019-20)



Staff 140 Academic staff



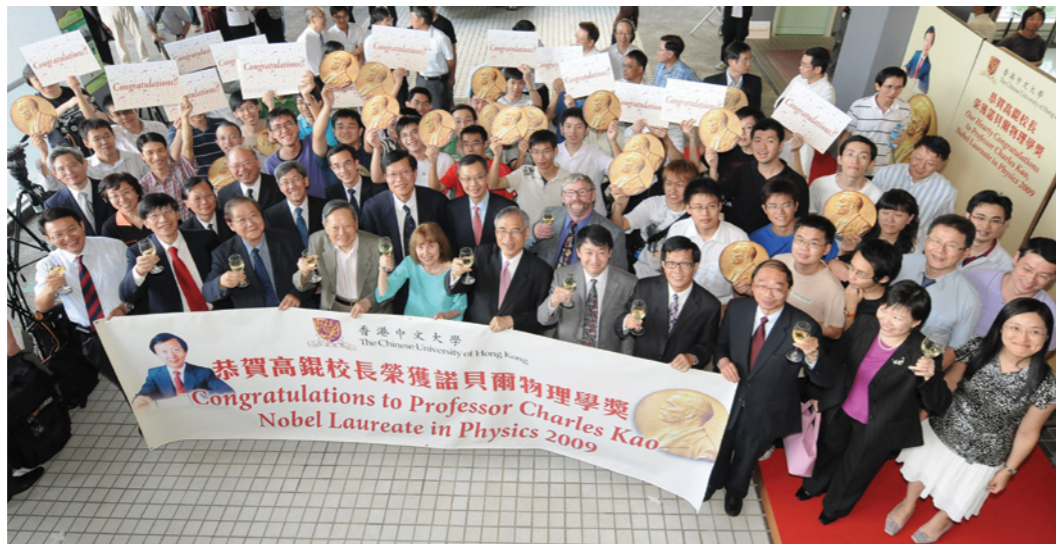
Excellence in Teaching and Research

Over a hundred of the Faculty professorial staff possesses extensive teaching and research experience. Not only do they educate youngsters with passion, but they also develop forefront technologies that benefit to society. The great range of research areas include mechanics, electronics, information processing, internet, digital entertainment, etc. Some of the research involves multi-disciplinary knowledge such as biomedical, energy, logistics and financial engineering. Our professors have extensively published their research findings in world-class journals and conferences, and at the same time applied their R&D results into practical usage. Their efforts were well recognized by the public, and many of them were awarded different international prizes and honours.



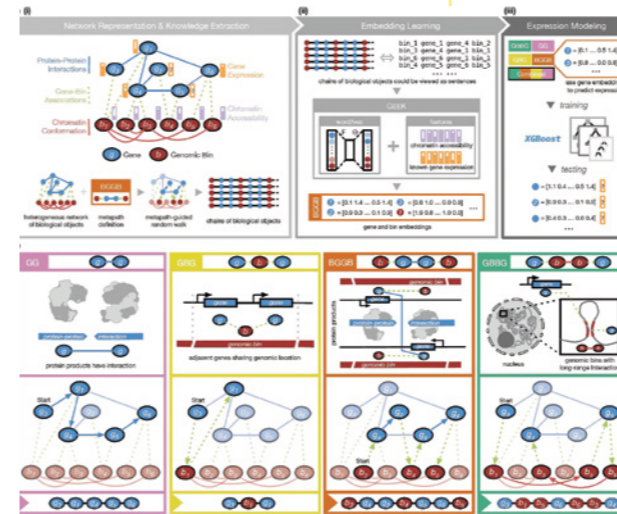
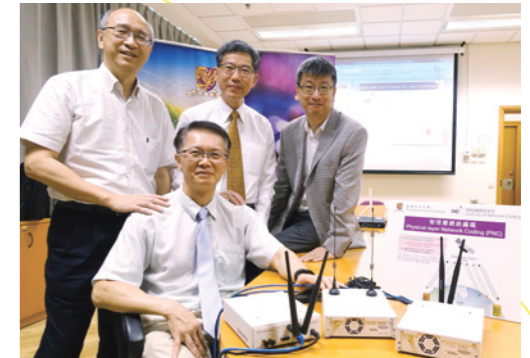
Father of Fibre Optics

The late former Vice-Chancellor Prof. Charles Kao founded the Department of Electronic Engineering in 1970. He innovated the groundbreaking optical fibre communication that changed the world, and built a long-term research strategy focusing on information and communications technologies at CUHK.



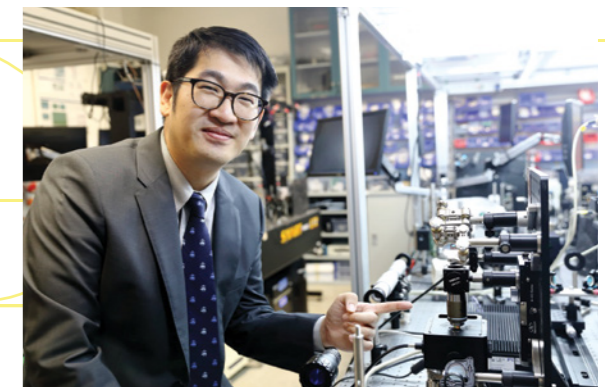
CUHK is one of the pioneers in the research on AI and deep learning. In the GPU Technology Conference 2016 held in Silicon Valley, CUHK was the only institution in Asia to receive this recognition. It is also recognised as the most innovative university in Hong Kong for the fourth consecutive year and is ranked 22nd in the Asia-Pacific region by Reuters' Asia Pacific Region's Most Innovative Universities.

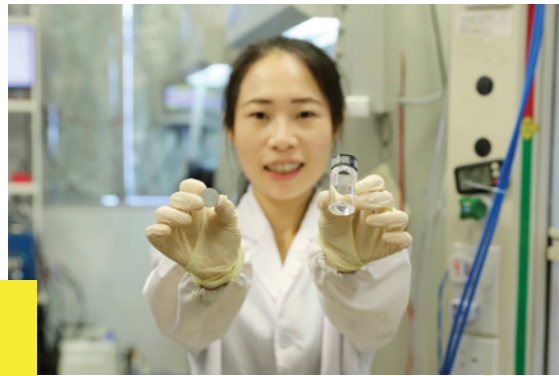
CUHK was named by Thomson Reuters as one of the 10 research institutions in the world with the most impact on telecommunications, the only Asian institution on the list in 2015. Prof. Soung-chang Liew's research team has developed the Physical-layer Network Coding as a promising technique that significantly improves the capacity and energy efficiency of wireless networks by tackling the wireless interference problem.



Prof. Kevin Yip's research team has developed a new Gene Expression Embedding framework (GEEK), which uses AI technologies in machine learning and natural language processing to study the regulation of gene expression. In contrast to previous works that focused on one or a few regulatory mechanisms at a time, the new framework can study the joint effects of many mechanisms simultaneously and may help further study the causes of cancers and treatment methods.

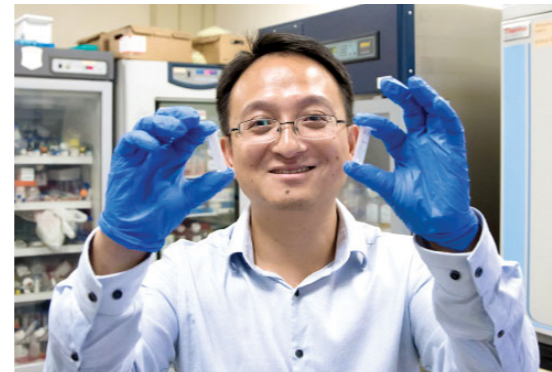
Prof. Shih-Chi Chen's team has collaborated with the Lawrence Livermore National Laboratory to develop the "Femtosecond Projection Two-photon Lithography" printing technology. By controlling the laser spectrum via temporal focusing, the laser 3D printing process is performed in a parallel layer-by-layer fashion instead of point-by-point writing. The new technique substantially increases the printing speed by 1,000 - 10,000 times, and reduces the cost by 98%.



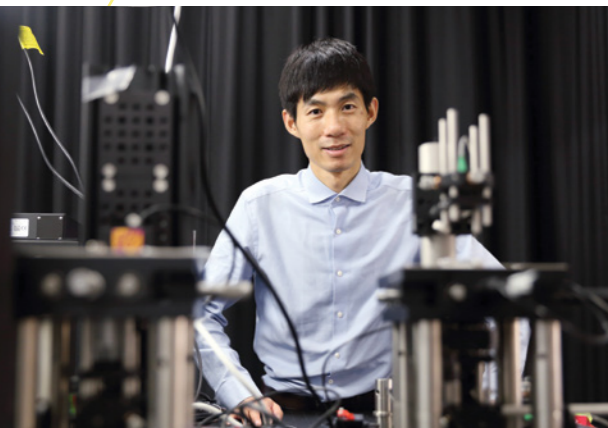


A research team led by Prof. Yi-Chun Lu has taken a critical step forward in improving high-energy batteries by introducing a novel electrolyte to the aqueous lithium-ion (Li-ion) battery. This electrolyte is commonly used in skin cream. It is inexpensive, non-flammable, less toxic and is eco-friendly, yet can create stable voltage for common usage.

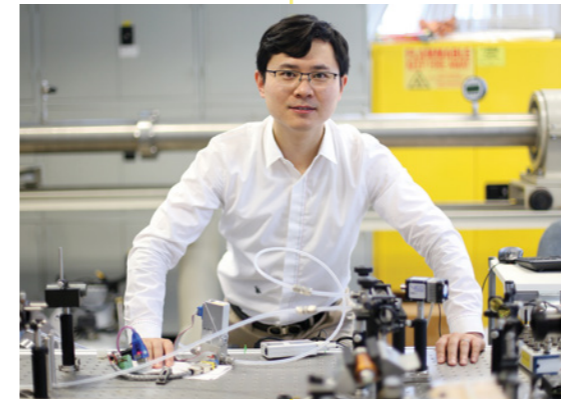
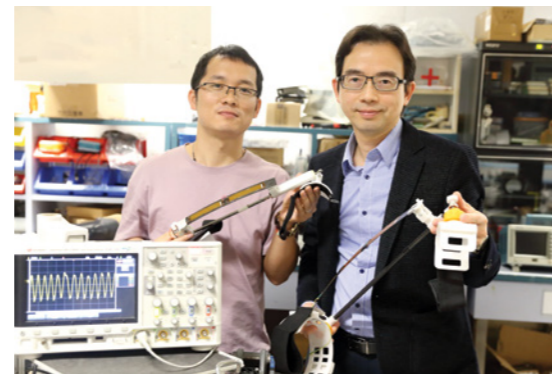
Prof. Liming Bian and his team has discovered new properties for hydrogels. Hydrogels are the hydrated polymer networks that form the permeable reservoir to allow nutrients to move into and nourish the cells within; they can act like a liquid to reshape and flow when needed. Professor BHis team is the first to use those reversible connections to make dynamic hydrogels that can contain cultivable cells.



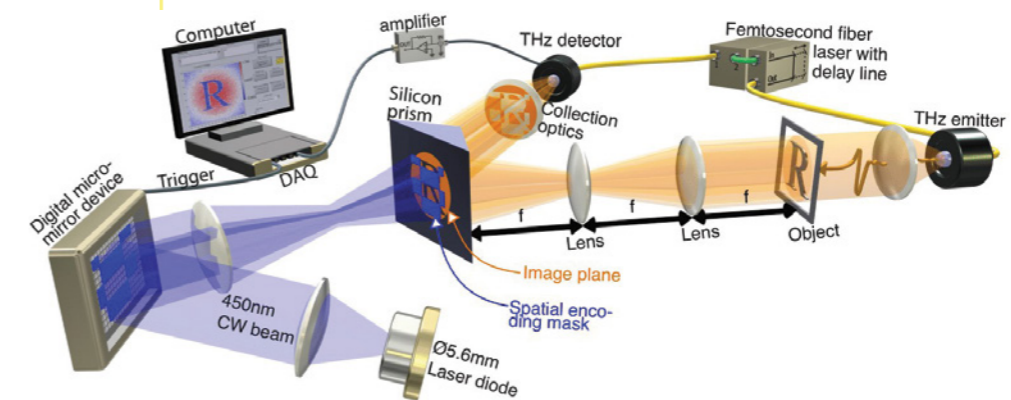
Prof. Renjie Zhou has been awarded the Croucher Innovation Award 2019 in the amount of HK\$5 million in research expenses by the Croucher Foundation for his outstanding research achievements in optical diffraction tomography and in support of his future research works. He is developing a new "Reflection-mode TPM for label-free in vivo imaging applications using light diffraction and coherence properties", to make new breakthroughs and further applications in in vivo imaging technology.



A research team led by Prof Wei-Hsin Liao has developed a lightweight smart materials-based energy harvester for scavenging energy from human motion, generating inexhaustible and sustainable power supply just from walking. Specifically, the device can capture biomechanical energy from the motion of the human knee and then convert it to electricity which can be used to power wearable electronics such as pedometers, health monitors, and GPS.

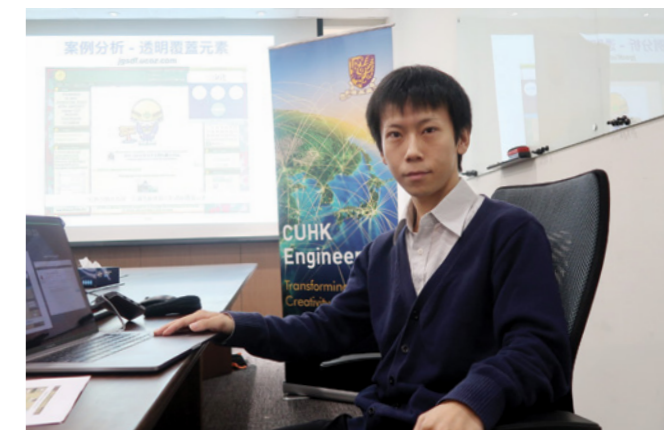


A research team led by Prof. Wei Ren has adopted high-level quantum chemistry calculations to provide a definitive answer to the role of water vapour in some important atmospheric reactions. The new findings will enable a more accurate and reliable prediction of air pollution and atmospheric chemistry.



Prof. Emma Pickwell-Macpherson's research team from CUHK and the University of Warwick has reached a crucial milestone towards developing single-pixel terahertz radiation (T-ray) imaging technology. Their single-pixel T-ray camera reached 100 times faster acquisition than the previous state-of-the-art without adding any significant costs to the entire system or sacrificing the sub-picosecond temporal resolution, potentially opening the opportunity for them to be used in non-invasive security and medical screening.

Malicious third-party advertisers or hackers expose web users to a security threat by injecting malicious JavaScript code to intercept user clicks and trick them into visiting untrusted web content. To investigate the problem of click interception, the research team led by Prof. Wei Meng has developed a browser-based analysis framework — Observer, which is able to detect three different techniques for intercepting web user clicks.



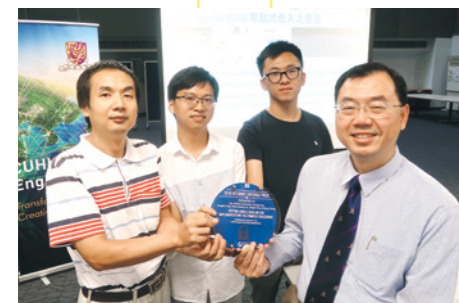
Student Achievements

The Faculty has been nurturing countless engineering professionals with excellent academic performance since its inception in 1991. Apart from academic knowledge acquisition, they have actively participated in various local and international activities, and a number of them have also represented Hong Kong to participate in overseas contests and returned with great success.



The Engineering student robotics team Phantom Dancer was crowned Champion in the The Asia-Pacific Broadcasting Union Asia-Pacific Robot Contest (Robocon). CUHK is the first Hong Kong team to win this international trophy for robotics since the competition began in 2002.

The university received 11 awards in the 6th Hong Kong University Student Innovation and Entrepreneurship Competition. A start-up team from the Department of Biomedical Engineering has been dedicated to the development of latest soft wearable robotics technologies for rehabilitation of people after stroke and the elderly with joint diseases. In partnership with the Neurorehabilitation and Robotics Laboratory at CUHK, they introduced the pioneering soft wearable robotic exoskeletons to hospitals and rehabilitation centers.

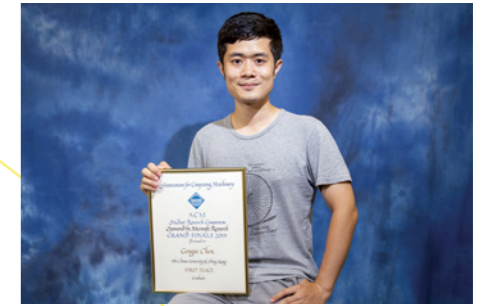


A team from the Department of Information Engineering has won the third place of the 2018 Internet Defense Prize and a research grant of US\$40,000 funded by Facebook at the 27th USENIX Security Symposium. The award was for their contribution to the critical analysis of the security of Single Sign-On (SSO) Software Development Kits (SDKs) deployed in practice. This is the first time for researchers from an Asian institution to receive this international award.

The programming team won a bronze medal at the 43rd Annual World Finals of the International Collegiate Programming Contest held in Porto, Portugal, defeating traditional prestigious teams from Stanford University, Harvard University, and Carnegie Mellon University.



Mr. Gengjie Chen, a PhD student has taken First Place in the Association for Computing Machinery (ACM) Student Research Competition Grand Finals, with the research project themed "VLSI Routing: Seeing Nano Tree in Giga Forest".



A genetic engineering team of undergraduate students has been awarded a Gold medal at the International Genetically Engineered Machine (iGEM) 2019 Giant Jamboree held in Boston, USA, for developing a rapid test for a new disease Banana Xanthomonas Wilt (BXW). This is the sixth time that a CUHK team has won gold in the annual premier synthetic biology competition.

Two teams have won the Championship in the Bank of China (Hong Kong) FinTech Hackathon and received first runner-up in the UHackFin organised by the HKUST. The first team proposed a new platform named 'A.I. Stock Analyser' that digests huge amounts of market information and provides personalised stock analysis to meet the rising demands of investors. The other team focused on the past performance of initial coin offering (ICO) for improving the future of financial services.



A student's final-year project won the Gold Prize in the 2018 HKEIA Innovation & Technology Project Competition Award organized by the Hong Kong Electronic Industries Association. The project title is detection and screening of cantonese child speech sound disorder using automatic speech recognition techniques.

A student team supervised by Prof. Daniel Long has won the Championship in The Chartered Institutions of Logistics and Transportation in Hong Kong (CILTHK) Student Day 2019. They have tackled and presented the topic "What are your proposed solutions to ensure no invasion of drone in airport".



Diverse Learning Experiences

Engineering Leadership, Innovation, Technology and Entrepreneurship Stream (ELITE Stream)

The ELITE Stream is offered by the Faculty to students with excellent academic performance. It aims to nurture outstanding engineering students and to develop their potentials through additional challenging courseworks and invaluable extra-curricular activities. The award of the ELITE Stream to qualified students will be officially recorded on academic transcript together with a certificate. A series of stimulating and inspiring courses will be offered exclusively for ELITE students. There are exclusive scholarships, special exchange opportunities, social and scholarly events specially organized for ELITE students.

Details of the entrance, coursework requirements and declaration procedures for the Stream can be viewed at: www.erg.cuhk.edu.hk/erg/elite



European Innovation Academy

ELITE students were nominated to participate in European Innovation Academy in Europe, a three-week programme where participants from various universities around the world worked in multidisciplinary teams to start up new IT innovations, mentored and educated by industry leaders and professors.



Choi Chi Kit, Jason

Computer Science graduate under ELITE Stream

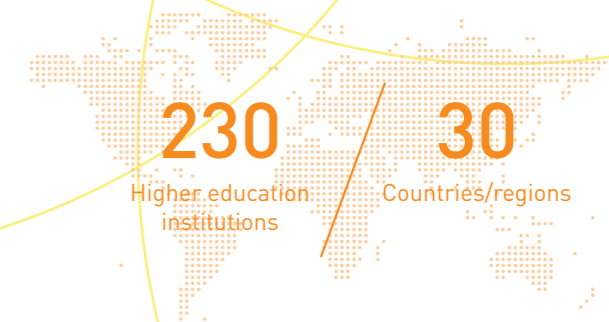
There are no shortcuts in engineering. From computer science to mechanical engineering, all engineering disciplines require both rigorous theoretical knowledge and in-depth practical skills. Having realised this, I am extremely glad to have chosen CUHK Engineering programme. Not only do we get extensive theoretical training in maths and physics, but we could also apply our knowledge through project-based learning. The foundation year, in the meantime, has reinforced my interest in computer science, and certainly has inspired many to find their true calling. I am also grateful for the special care given to high-achieving students through the ELITE Stream, through which top students are challenged to broaden and deepen their learning scopes. I have met like-minded friends and study partners.

Undergraduate Summer Research Internship

The Faculty has launched the Undergraduate Summer Research Internship programme to support its students to undertake research projects under supervision of professors in summer. This programme gives students exposure to research environment, and grooms them for graduate studies.

International Exchange

The University has exchange agreements with over 230 higher education institutions in 30 countries/regions covering Asia, Australia, Europe, and the Americas. To broaden students' international exposure, the Faculty also offers numerous overseas summer study programmes and internship opportunities.



Professor Charles K. Kao Research Exchange Scholarship

To pay tribute to Prof. Charles K. Kao for his achievements in science and technologies and to commemorate his being awarded the Nobel Prize in Physics 2009, the University has set up the Charles K. Kao Scholarship Endowment Fund to support outstanding students of Engineering and Physics to go on research exchange at prestigious institutions overseas.



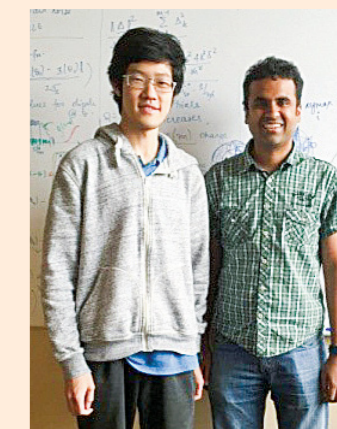
Professor Sir Charles K. Kao and Lady Kao meet the scholars at the inaugural ceremony of the CUHK Professor Charles K. Kao Scholars Association.

Bai Ziqian

Computer Science graduate

Recipient of Professor Charles K. Kao Research Exchange Scholarship

It was my great honor to be able to participate in this overseas research exchange program, during which I conducted research on the ECE department of Carnegie Mellon University about coded distributed computing for speeding up machine learning computations, supervised by Prof. Pulkit Grover. This wonderful experience not only enhanced my academic background, but also gave me an insightful understanding of the life in USA, and more specifically, a university student's life in Pittsburgh, and plenty of opportunities for making friends with talented minds.



GLOBEX Summer Programme@PKU

The programme, in collaboration with Peking University (PKU), supports engineering students to study both engineering and cultural courses in the College of Engineering, PKU.

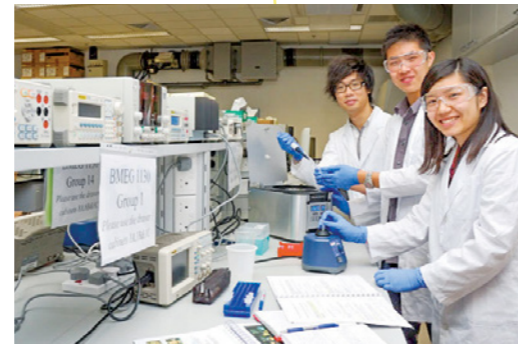


Leong Samantha Antonio
Biomedical Engineering graduate

It was in class that I met amazing and brilliant minds. There were students who were not afraid to speak up, challenge new ideas and question unclear concepts. There were students who could combine knowledge from other GLOBEX courses and use it in their own design in presentations. There were friends I made that were brilliant not only in engineering, but also in other fields that I share an interest in. This month-long exchange was a never-ending stream of constant self-improvement. Needless to say, this exchange is very beneficial.

General Education

General Education plays a vital role in the University's mission to provide a balanced undergraduate education for all students. It equips students with the intellectual capacity for understanding critical issues, ideas, and values of humanity and of modern society. Engineering students, other than professional knowledge, should also equip themselves with broad knowledge to be successful. The University offers a wide range of general education courses that nurture students to be educated persons capable of making informed judgment, serving the community and taking up the challenges of this ever-changing world.



Double Majors and Minor Programmes

Engineering students can flexibly pursue second major or minor programmes according to their orientation and interest in other disciplines such as Business Administration, Economics, Journalism and Music, etc. Students developing multiple talents in combination of the Engineering major and minor programmes would certainly gain advantages after graduation.

Placement and Internship Programme

To assist students in developing their future career, the Faculty has been running the Placement and Internship Programme (PIP) for decades. Many students take the option of a one-year industrial full-time placement before they continue their final year of study. They will be engaged in a supervised training in an organization normally for a period of twelve months, during which they will be exposed to real working environment and will take part in projects working together with experienced engineering professionals. The comprehensive and intensive training provide students with valuable working experience.

The Faculty also collaborates with companies to hold regular recruitment talks, technology seminars and workshops such that students can keep abreast of the industrial trend.



List of selected companies participating in the PIP

- Asia Satellite Telecommunications Co. Limited
- ASM Pacific Technology Limited
- CLP Holdings Limited
- Fujitsu PC Asia Pacific Limited
- Google
- Hewlett Packard HK SAR Limited
- Hong Kong CSL Limited
- Hong Kong Deposit Protection Board
- Hong Kong Monetary Authority
- Hong Kong Science and Technology Parks Corporation
- IBM
- ITE Smartcard Solutions Limited
- LinkPOWER Technology Co. Limited
- Microsoft
- Chief Information Office, Office of the HKSAR Government
- OKIA Optical Co. Limited
- Securities and Futures Commission
- Smartone Telecommunications Holdings Limited
- Sun Hung Kai Real Estate Agency Limited
- The Hong Kong Jockey Club
- The Hong Kong and Shanghai Banking Corporation
- The Hong Kong Mortgage Corporation Limited
- The Hong Kong School Net Limited
- Thomson Reuters Hong Kong Limited
- TNS
- VTech Telecommunications Limited

For more information, please visit the website of Centre for Innovation and Technology, Faculty of Engineering:
<https://pip.erg.cuhk.edu.hk>



Curriculum

To offer greater flexibility for students, the Faculty broad-based admission and programme-based admission would run in parallel.

A wide choices of 11 engineering programmes

Broad-based admission	Programme-based admission
<ul style="list-style-type: none"> • Computer Engineering • Computer Science • Information Engineering • Mathematics and Information Engineering • Mechanical and Automation Engineering • Systems Engineering and Engineering Management 	<ul style="list-style-type: none"> • Artificial Intelligence: Systems and Technologies • Biomedical Engineering • Electronic Engineering • Energy and Environmental Engineering • Financial Technology

Under the broad-based admission line, the Faculty admits applicants with HKDSE qualifications for its six undergraduate programmes, i.e. Computer Engineering, Computer Science, Information Engineering, Mathematics and Information Engineering, Mechanical and Automation Engineering, and Systems Engineering and Engineering Management. Applicants can simply put down JUPAS code: JS4401 for application for the six programmes.

Students in the first year of study will not have a specific major. They will study common Faculty Foundation Courses, and at the same time, explore their interests in different areas of engineering. The first-year experience is particularly important for new students to transit smoothly from high school to university as well as from pupil to self-directed learners, therefore each new student will be assigned an Academic Advisor who plays a crucial role not only in providing individualized advice on study planning but also in helping students tackle and mature from such developmental changes and challenges.

Eligible students will be asked to prioritize their preferred majors after completing their first year of study. Their preferences will be given due consideration in the major allocation process. The Faculty aims to assign as many students as possible to their most preferred programmes, as long as the programmes have sufficient resources and facilities (e.g., laboratory spaces and equipment) to ensure quality teaching and learning. In the academic year 2019-20, almost 80% of students were allocated to their top prioritized programme.

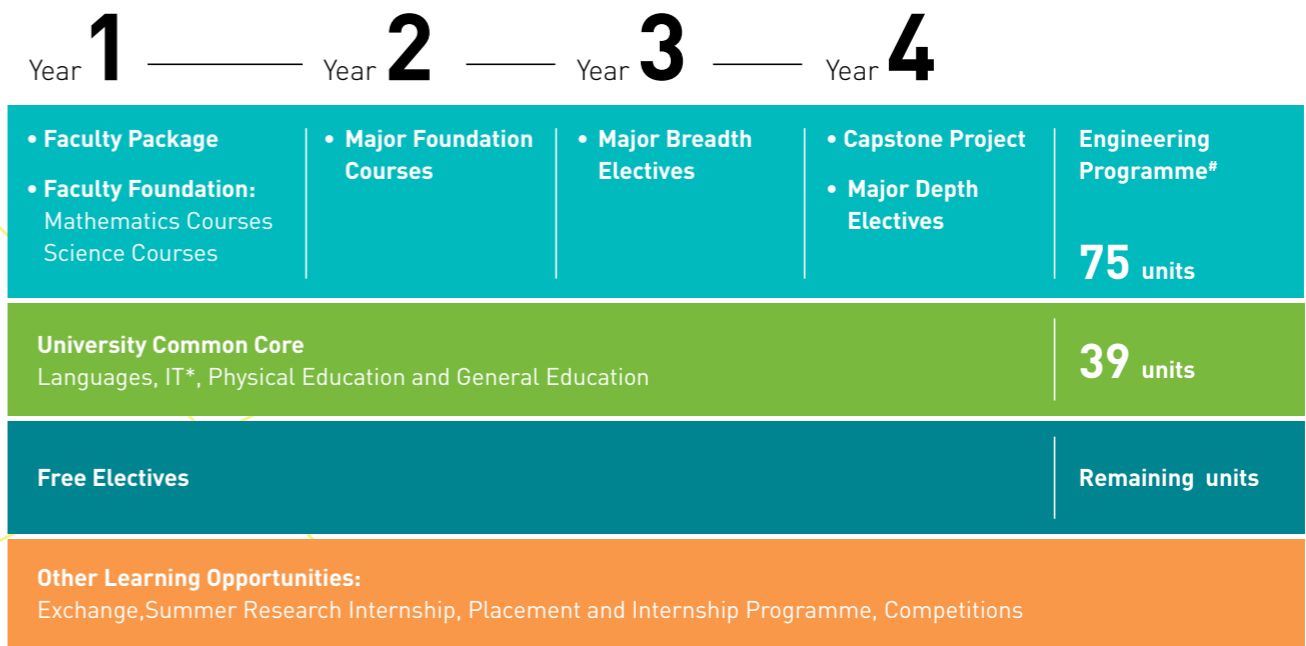
Artificial Intelligence: Systems and Technologies, Biomedical Engineering, Electronic Engineering, Energy and Environmental Engineering, and Financial Technology adopt programme-based admission.



Engineering Undergraduate Curriculum

The curriculum is built on a credit-unit system, and the normative period of study is four years. Students have to complete 123 units and satisfy the University requirements under separate categories. The overall curriculum structure is as follows:

Requirements	Units
University Common Core	39 units
<ul style="list-style-type: none"> • English • Chinese • Physical Education • IT* • General Education 	9 6 2 1 21
Major Programme #	75 units
<ul style="list-style-type: none"> • Faculty Package • Faculty Foundation Courses • Major Foundation, Required and Elective Courses 	9 Minimum 11 Up to 49
Free Electives	Remaining units
Total units for graduation:	At least 123 units



Total units of requirement | 123 units

* The 1-unit course will be exempted for Engineering graduates.

The major requirement of the Mathematics and Information Engineering Programme is 84 units.

Undergraduate Programmes



COMPUTER ENGINEERING

The Computer Engineering (CE) programme was formally established when the Faculty of Engineering was inaugurated in 1991. The CE programme is a balanced programme with an emphasis on both computer hardware and software. Our CE programme distinguishes itself from others by offering specialized training for students in computer design, mobile embedded systems, microprocessors, and very large-scale integrated circuit (VLSI) design.

With the advancement in VLSI and microprocessors, innovative products such as smartphones, 3D TVs, digital cameras, supercomputers, computer games, etc. are invented continuously. Given the new challenges and opportunities ahead, our CE programme is designed to equip graduates to meet those demands.

“Engineering is the application of scientific principles toward practical ends.”

- Steve McConnell



Programme Features

The CE curriculum consists of courses in the following areas:

- Application: mobile embedded devices, computer graphics, multimedia processing;
- Computer hardware: circuitry theory, logic system design, computer architecture and interfacing, computer arithmetic;
- Computer software: programming, data structures, operating systems, algorithm, software engineering;
- Very large-scale integrated circuit (VLSI) design: computer-aided design and applications;
- System connectivity: computer network.

Other advanced topics include:

- Hardware-accelerated bio-related processing;
- Hardware-aided security;
- Multi-core systems and architecture;
- Reconfigurable computing;
- Super-computing.

Career Prospects

Many of our CE graduates have successfully pursued their careers in local and international companies such as Intel, Microsoft, IBM, and Google. Others have chosen to further their studies in our postgraduate programme or programmes in internationally renowned universities overseas.



Luk Sze Chai, Alvin

2019 BEng (Computer Engineering) graduate
Programmer, Qualcomm Innovations (Asia) Limited

I love studying software design and building up models. A tiny change in the system can come up with a very different outcome, and I am hooked on exploring the interrelationship between them. Thus, I choose CUHK's Computer Engineering programme without any hesitation when applying for universities.

The CE programme helped me to build up a solid foundation in logic, systems, and theories. It also places equal emphasis on providing practical experience. I am able to implement the knowledge and create my own projects. For example, in my final year project, after repeated trials and adjustments in both the algorithm and hardware design, I am able to find out an optimized way to improve the precision and efficiency of an obstacle avoidance motor car.

Studying in the CE programme is not an easy task, particularly when I need to handle tones of assignments and laboratory exercises at the same time. However, it is a good turning point to skill up my time management. On the other hand, teachers are always enthusiastic about discussing complex topics with us, inspiring us to search for breakthroughs.

The CE programme progressively leads me to master the latest computer engineering developments, and I am confident to apply what I have learnt in my future career.

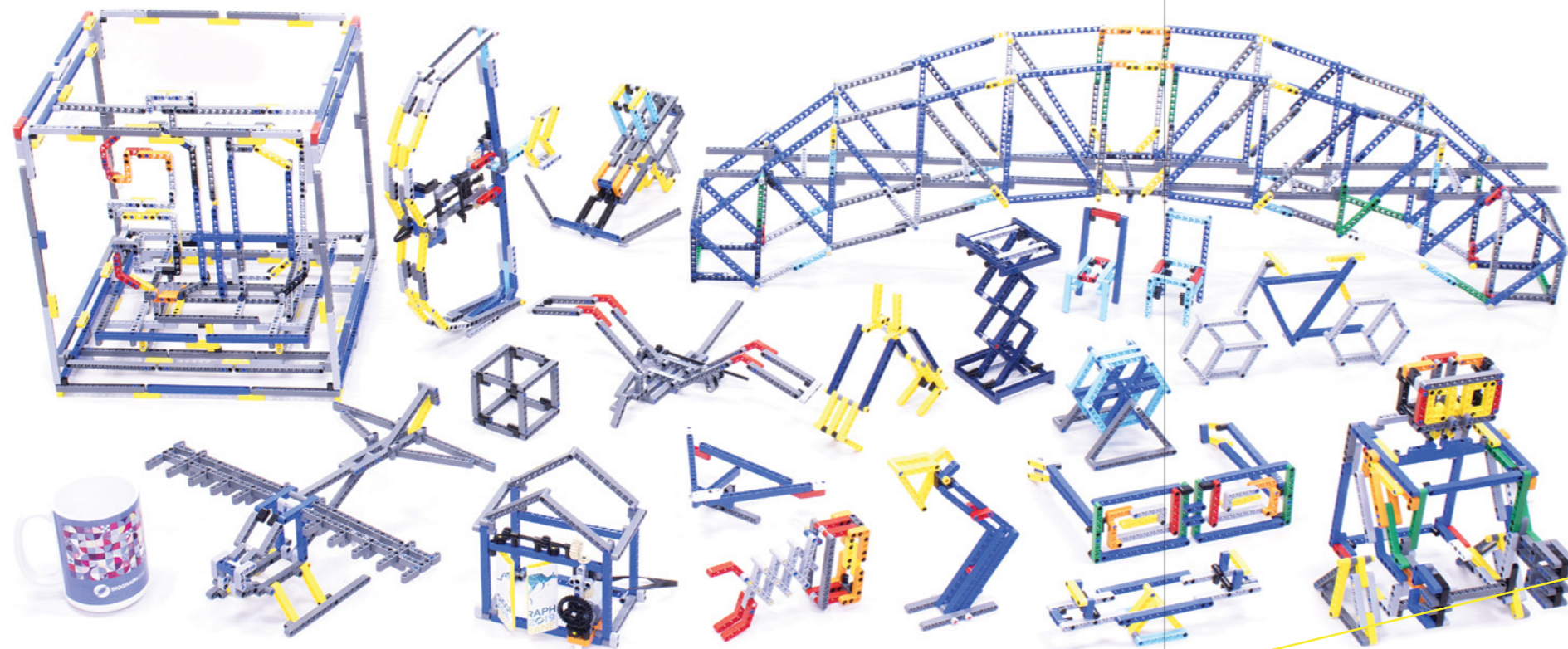


COMPUTER SCIENCE

The Computer Science (CS) programme was launched by the Department of Computer Science and Engineering more than 30 years ago. It is accredited by the Hong Kong Institution of Engineers (HKIE) and has gained an international reputation for excellent research and teaching.

“Computer programming is an art, because it applies accumulated knowledge to the world, because it requires skill and ingenuity, and especially because it produces objects of beauty.”

- Donald Knuth



Programme Features

The CS programme covers the following areas:

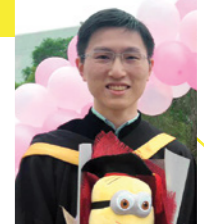
- Artificial Intelligence
- Big Data Analytics
- Bioinformatics
- Computer and Network Security
- Computer Systems and Networking
- Computer-aided Design
- Databases
- Digital Hardware Technologies
- Information Systems
- Internet
- Multimedia Technology
- Programming Languages
- Software Engineering
- Theoretical Computer Science

Career Prospects

Over the years, the Department of Computer Science and Engineering has built up a large alumni network in the computer industry of Hong Kong. Many of our graduates have taken up important positions in various organizations and companies, such as the HKSAR Government, Intel, Microsoft, IBM, and Google. Through this network, our graduates can enjoy a comparative advantage in professional career development. Apart from choosing to work in the industry, some graduates have entered our Master and Doctoral programmes or similar programmes in world-renowned universities overseas for postgraduate education.

Chan Chun Sum, Maxwell

2019 BSc (Computer Science) graduate
IT Graduate Trainee, Cathay Pacific Airways



Computer programming has been one of my favorite studies since secondary school. It has been amazing that just a few lines of simple code can solve complex problems and perform various works. Thus, I have no doubt to place CUHK's Computer Science programme as my first choice.

The CS programme allowed a high degree of flexibility in learning. I could have a try in different fields, such as artificial intelligence, database, rich media, network security, etc., to explore my study interest and strengthen the relevant technical skills. I could then proceed to the more advanced topics for in-depth learning. The courses were challenging and demanding, yet helped me to build up a problem-solving mindset and self-confidence, which are of critical importance to my personal and career development in the future.

Apart from studying, I joined a six-week IT internship programme in Melbourne in Year 2. It was a valuable and eye-opening opportunity for me to gain practical work experience in an actual workplace, and learn to be more independent and explore the cultural differences between Hong Kong and foreign countries.

After graduation, I joined the Cathay Pacific Airways IT Graduate Trainee programme. My job duties would rotate across different departments. Someday, I would become an all-round expert in application development.



INFORMATION ENGINEERING

The Information Engineering (IE) programme is designed to nurture and educate engineering leaders for the Information World of today and tomorrow. We offer all-round training in the areas of communications systems and networks, Internet engineering, cybersecurity, mobile and cloud computing, multimedia processing, big data, as well as software engineering. Our professors are dedicated educators and world-class researchers. Many of them have extensive experience with leading research institutions world-wide before joining the department.

Knowledge is Power;
Information is King.

Programme Features

Information Engineering encompasses the generation, distribution, analysis and application of information in engineering systems. Key areas of study include:

- Telecommunications: Optical Networks, Wireless Communications, Analog and Digital Circuits, Switching Systems, Teletraffic Theory, Network Coding, Information Theory;
- Internet and Applications: Internet Protocols and Systems, Network Software Design and Programming, Online Social Networks, Internet of Things, Network Economics, Mobile Networking;
- Big Data and Multimedia: Image and Video Processing, Multimedia Coding, Web-scale Information Analytics, Programming Big Data Systems, Building Scalable Internet Services, Social Media and Human Information Interaction;
- Cyber Security: Applied Cryptography, Web Programming and Security, Digital Forensics, Security and Privacy in Cyber Systems.

Students may choose to specialize in one or more of the 5 streams — **Big Data, Communications, Cyber Security, Internet Engineering** and **Enrichment Streams**.

The programme is accredited by the Hong Kong Institution of Engineers (HKIE).

Career Prospects

IE graduates are equipped with solid engineering knowledge and analytical problem solving skills to create innovative solutions for important practical problems. Our graduates have embarked on successful careers in companies like Morgan Stanley, HSBC, Smartone, IBM, MTR, Google, and more, or have started their own business. Each year, around 10% of our graduates further studies overseas or locally. Their destinations include top schools like CMU, MIT, Stanford, Berkeley, Caltech, Cambridge, and more.



Yang Zheyuan

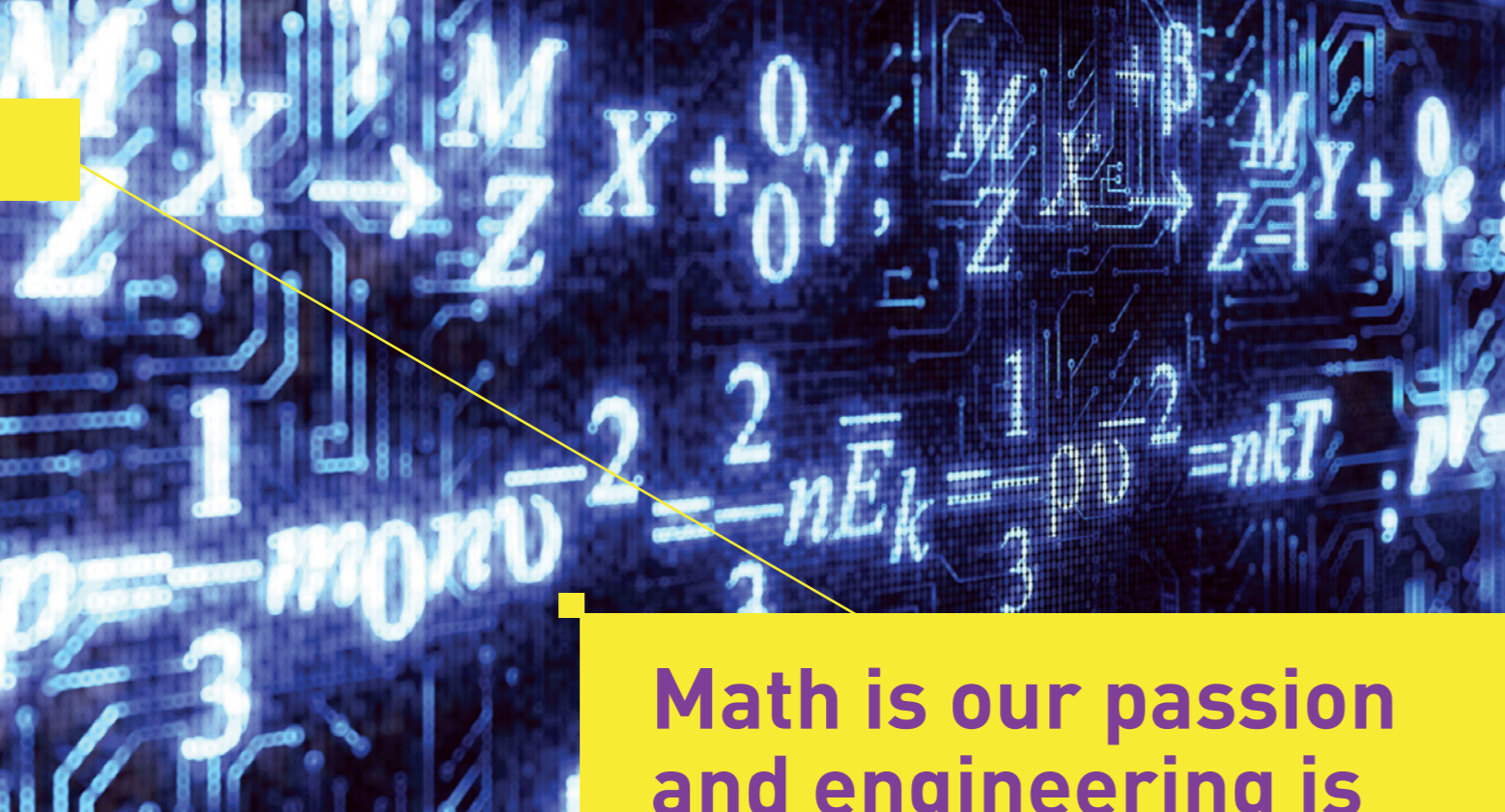
2019 BEng (Information Engineering) graduate
PhD student in Information Engineering at CUHK

The well-structured curriculum offered by the Department of Information Engineering has equipped me with a solid knowledge foundation. Thanks to its breath and depth, this curriculum covers a variety of streams which can inspire students with different interests. Its breadth and depth are quite reasonable. Besides, our professors are dedicated to teaching students with patience.

Other than lectures and labs, the Department of Information Engineering also offers a summer research programme for undergraduate students to develop their research skills. I have done two such summer research internships, during both of which I have learned a lot thanks to the professional instructions by the supervisors.

I have also got an opportunity to participate in a one-term exchange programme at another prestigious university — the University of Illinois at Urbana-Champaign, USA-granted by the CUHK Office of Academic Links and the Department of Information Engineering through an IE award. This unique exchange experience has given me more confidence when facing challenges.





**Math is our passion
and engineering is
our profession.**

MATHEMATICS AND INFORMATION ENGINEERING

This programme is offered jointly by the Departments of Mathematics and Information Engineering to provide students with diversified and advanced knowledge in the interdisciplinary study of mathematics and engineering. This demanding and boutique programme aims at educating a new generation of cutting-edge information scientists who are well-trained in the basics of communications, computer networks, algorithm design, and formal mathematics.

Programme Features

The programme places strong emphasis on research and encourages independent studies under the supervision of professors from both Departments. Students will have opportunities to take up research work during their later years of study and a significant fraction of graduates from this small programme get to pursue graduate studies in the top schools worldwide.

Career Prospects

The career prospects of graduates are very promising because of the unique combination of abstract mathematical thinking abilities and solid engineering know-how for tackling problems. Career opportunities cover a diversity of fields including (but not limited to):

- Research — pursue postgraduate studies in areas related to mathematics, information engineering, or computer science;
- Information analysis — analyse and process information in quantifiable forms for the finance and banking industries;
- Engineering — engineering careers related to networking, security, and system management.



Tang Sum Yee

2019 BSc (Mathematics and Information Engineering) graduate
Technology Analyst J.P. Morgan.

I have been interested in studying mathematics since my time as a high school student. MIE is a rigorous and comprehensive programme that enabled me to explore both mathematics and its applications. The MATH courses have provided a thorough mathematical training that has significantly enhanced my problem-solving skills and my ability to think abstractly; while IE courses have provided the relevant background for solving real-world problems. Studying in these two disciplines has given me a solid foundation that has enabled me to go for advanced studies.

During my years at CUHK, I have been able to broaden my horizon thanks to the participation in an overseas exchange programme and various internships. In particular, participating in the exchange programme has allowed me to explore other disciplines such as financial mathematics. After my graduation, I have joined J.P. Morgan as a Technology Analyst and I have found the training beneficial to my future career.



The Mechanical and Automation Engineering (MAE) programme emphasizes the impact of modern automation technologies on current and future developments in the field of mechanical engineering. The programme stresses a balanced curriculum in both basic theory and hands-on practice, and covering subject areas such as mechanics and materials, thermodynamics, mechanical design, manufacturing processes, mechatronics and robotics.

MECHANICAL AND AUTOMATION ENGINEERING

“Engineers should press forward with development to meet the diversified needs of people.”

- Harold Chestnut (1981), American electrical engineer, control engineer and manager at General Electric



Programme Features

The curriculum covers the fundamental knowledge in the areas of mechanical and automation engineering, including mechanics and materials, thermodynamics, control, manufacturing, and electronics. Students can pursue more in-depth knowledge in the subjects of their choices, such as computer-aided design and graphics, robotics, mechatronics, intelligence system, engineering optimization and MEMS. Students may choose to specialize in one of the following three streams or not to specialize in any stream:

- Design and Manufacturing
- Mechatronics
- Robotics and Automation

Courses in business, technical communications, engineering ethics, design application and final year projects are included in the programme to enhance students' training as professional practitioners. The Department also provides summer internships, work-study programmes and international exchange opportunities for its undergraduate students.

Lam Miu Ling, Cherry

2000 BEng, 2002 MPhil, and 2008 PhD (Mechanical and Automation Engineering) graduate
Associate Professor, School of Creative Media, City University of Hong Kong

I am a media artist and associate professor in School of Creative Media at City University of Hong Kong. I received my BEng, MPhil and PhD degrees all from the Department of Mechanical and Automation Engineering with a focus on robotics and wireless sensor network research. I was an engineer in Hong Kong Aero Engine Services Limited before the PhD Programme. Upon PhD graduation, I was awarded a prestigious fellowship by the Croucher Foundation to support my postdoctoral research at the California Nanosystems Institute at UCLA. My current research projects focus on bioinformatics and physical intelligence.

As a media artist, I create artworks on the cutting-edge technologies and at the intersection of art, technology and science. The trainings on computer science, engineering design, and electronics obtained from MAE Department equipped me to explore new art dimensions by introducing novel ingredients to media arts. The MAEG Programme is not only practical for the development of engineering perspectives and researches, but also offering the possibilities to bridge across multiple disciplines.



Career Prospects

Upon graduation, MAE students find career opportunities as mechanical engineers, production engineers, control engineers and design engineers and other professions that rely on the programme's engineering training. They can also pursue graduate studies in their specialized areas of interest in Hong Kong or overseas.

Ho Chung Yan

2016 BEng (Mechanical and Automation Engineering) and 2017 BBA (Integrate BBA) graduate
Graduate Engineer, Airport Authority Hong Kong

It is my passion in the aviation industry that motivated me to become an engineer. During my five-year study, I have learnt much practical knowledge in engineering field including robotics and material engineering. I have participated in the Robocon HK competition 2016 which utilized much of what I have learnt and resulted us in championship. Also, I could further apply them in my internship in the air cargo terminal. My energy management skills were applied on the cooling fan installation project and the theory of electronics was important when handling with the conveyor system.

Besides, I seized the opportunities provided by MAE to explore more beyond our study in CUHK. In 2015, I went on an exchange program in the Engineering Department in University College London to learn more engineering management skills. Furthermore, I joined the double-degree program majoring in Marketing, IBBA as well to train our mindset to be more innovative which is essential for an engineer. After graduated, I am now working in the Airport Authority Hong Kong as a graduate engineer which fulfilled my passion. In my current career, the tasks I need to handle are more complicated and are not only related to the engineering discipline.





SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT

The Department of Systems Engineering and Engineering Management uses information technologies and mathematical tools to tackle the problems that arise in the study of complex, man-made systems such as supply chains, financial markets, logistics management, transport networks and business operations. Our undergraduate programme offers students a well-rounded education that equips them with the knowledge and skill-set necessary to compete not only in Hong Kong — a major financial and logistics centre with a thriving service industry — but also in the knowledge- and technology-based global economy.

“Not enough of our society is trained how to understand and interpret quantitative information. This activity is a centerpiece of science literacy to which we should all strive — the future health, wealth, and security of our democracy depend on it. Until that is achieved, we are at risk of making under-informed decisions that affect ourselves, our communities, our country, and even the world. — Neil DeGrasse Tyson

Programme Features

Our undergraduate programme offers intensive training in the fundamentals of information systems, decision sciences, technology management and entrepreneurship. In addition, the programme offers the following two specialization streams:

- Business Information Systems — focuses on the design, analysis and management of effective systems for storing, communicating and extracting information, which form the backbone of modern-day business and industrial operations.
- Decision Analytics — equips students with decision analytical skills such as statistical models, system simulation and optimization methods. The students will incorporate such skills in the decision making in the following areas.
 - Financial Engineering — emphasizes on the design and analysis of innovative financial instruments and strategies, as well as the use of advanced quantitative techniques and information technologies to manage and execute those strategies.
 - Logistics and Supply Chain Management — concerns with the coordination and management of material, financial and information flows of an enterprise's operations.
 - Service Engineering and Management — a newly introduced specialization, which combines interdisciplinary knowledge, such as information technologies, cognitive science, economics, marketing, etc., to support operations and create value in the ever-growing service industry.

Career Prospects

Training in Systems Engineering and Engineering Management provides exposures to interdisciplinary knowledge and a solid understanding of both technical and economic aspects of complex systems.

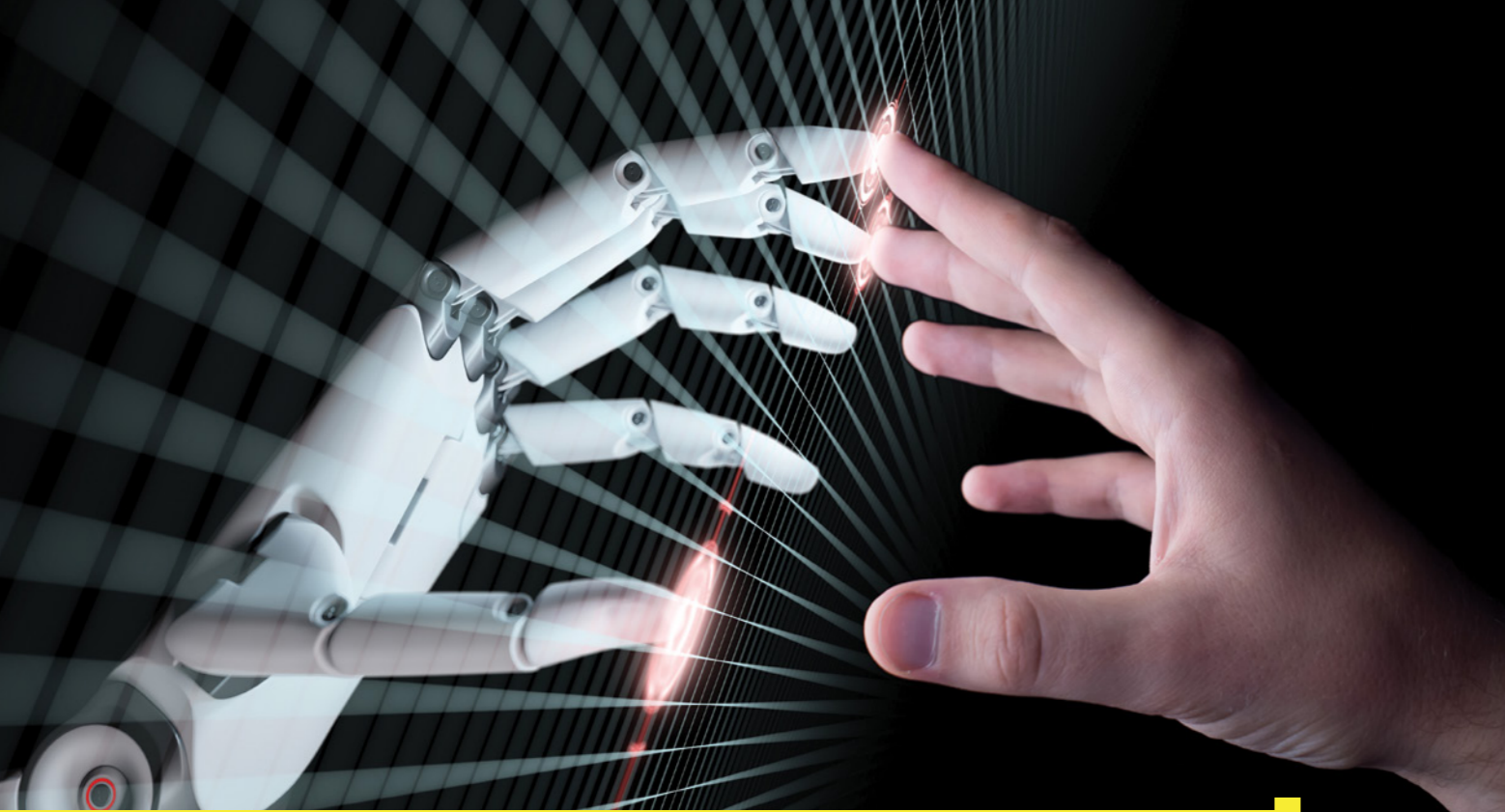
Our graduates typically take up positions in logistics management, financial analysis, consulting, information technologies and related fields. Many are currently enjoying very successful careers in organizations such as HSBC, Deloitte, IBM, P&G and Kelly Logistics.

Ying Yau Kit, Stanley

2019 BEng (Systems Engineering and Engineering Management) graduate
Business Development in FinTech

I am proud to have chosen SEEM as my major. The programme features an excellent balance between technology and commerce. In this era where technology is becoming increasingly relevant in everyday business, SEEM has offered me valuable insights into both information systems, data analytics and investment science. Knowledge in these areas has helped me to succeed in my current role as a Business Development associate in a fast-growing European FinTech, where I am responsible for strategizing and assisting the company's expansion in Asia. In this fast-changing environment, the ability to grasp and apply new business and technology concepts swiftly is a strong advantage, and the learnings and training I have received from SEEM have definitely laid a solid foundation for my entrepreneurial career. Lastly, I must express my sincerest gratitude to my supervisors and professors in SEEM for supporting and guiding my personal and professional development throughout the years.





“Our intelligence is what makes us human, and AI is an extension of that quality.” – Yann LeCun

ARTIFICIAL INTELLIGENCE: SYSTEMS AND TECHNOLOGIES



Automatic “manga filling style” conversion on Western comics and Japanese-style manga

Programme Features

Artificial Intelligence (AI) is an emerging engineering discipline that focuses on technological innovations in enabling computing systems to behave and discover new knowledge with human-like intelligence. It is a broad area that covers many specializations, such as machine learning, deep learning, knowledge representation/inference, large scale computing systems and distributed systems, logic/constraint programming, human-computer interactions, natural language processing, big data analytics, etc. It has evolved in multiple disciplines, such as finance, medicine, manufacturing, robotics, multimedia, telecommunications, computational linguistics, etc. On the other hand, there are critical challenges on how to innovate and design solid and rigorous solutions for AI, as well as how to properly address the ethical and societal issues with AI.

The AIST programme aims to equip students with the capabilities of designing and implementing AI systems and technologies that can analyze, reason, and infer knowledge from massive information, backed by rigorous foundations of mathematics, basic sciences, data structures, statistics, algorithms, distributed computing, etc. Such capabilities enable students to develop cutting-edge AI solutions that are of practical interest to academia, industry, and society.

The AIST programme emphasizes on fundamental mathematics, sciences, theories, and complements the knowledge with practical systems skill sets. Four optional specialized streams are offered for students to choose according to their interests:

- Biomedical Intelligence
- Intelligent Multimedia Processing
- Large-scale Artificial Intelligence – Theory and Systems
- Intelligent Manufacturing and Robotics

Career Prospects

The AIST programme is designed to meet today’s tremendous demand for well-trained talents in AI and related specializations. There is now a manpower shortage of AI specialists in both local and global employment markets. According to the Innovation and Technology Bureau, the HKSAR Government’s policies in innovation and technology such as re-industrialization, the expansion of the Science Park in Tseung Kwan O Industrial Estate, and the establishment of HK-Shenzhen Innovation and Technology Park in Lok Ma Chau Loop, are expected to create 50,000 jobs for people with knowledge and skills in high-end technologies. On the other hand, AI specialist is the top among the 15 emerging jobs in the USA, with an annual growth of 74% in demand, according to LinkedIn 2020 Emerging Jobs Report. For these reasons, CUHK aims to train talented AI engineers/scientists for the following industries: biomedical engineering/science, information and computing technologies, manufacturing and robotic, as well as intelligence multimedia processing for various Internet companies.

Rank	Emerging Jobs	Annual Growth in Demand
1	Artificial Intelligence Specialist	74%
2	Robotics Engineer	40%
3	Data Scientist	37%
4	Full Stack Engineer	35%
5	Site Reliability Engineer	34%

Source: LinkedIn 2020 Emerging Jobs Report

Biomedical engineering is an interdisciplinary field in which engineering and technology are innovatively applied to solve biological and medical problems for the benefit of mankind. The Biomedical Engineering programme is offered by the Faculty of Engineering in deep collaboration with Faculty of Medicine. Students not only benefit from learning at the forefront of the engineering and medical fields through the programme's core courses, but also enjoy the flexibility to choose from a wide variety of electives that allow them to focus on areas critical to their chosen careers.

The field is responsible for the development of medical engineering technology such as MRIs, brain-computer interface cardiac pacemakers, orthopaedic implants, rehabilitative devices, medical robotics, minimally-invasive endoscopes, etc. Biomedical devices are being developed at the micro- and nano-scale to enable diagnosis and therapeutics at the molecular and cellular levels. Students can take advantage of the breadth of cutting-edge biomedical engineering research available on campus through collaborative research in the Faculties of Engineering and Medicine.

BIOMEDICAL ENGINEERING



Technology and innovation is transforming our Health. Biomedical Engineers are enabling the transformation.

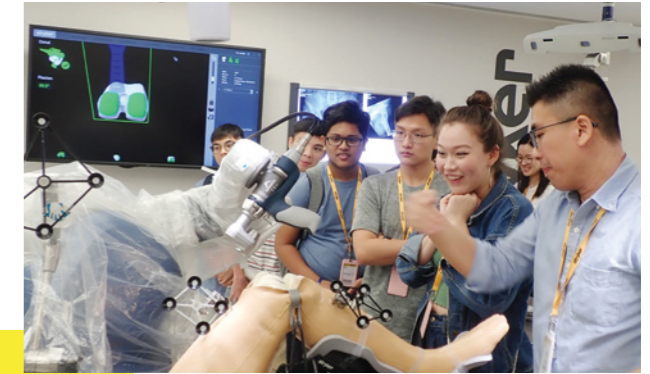
Programme Features

The programme's specialty areas are:

- Medical Instrumentation and Biosensors
- Biomedical Imaging, Informatics and Modeling
- Molecular, Cell and Tissue Engineering

Career Prospects

BME graduates work in hospitals, universities, government departments, other public organizations as well as industries. The careers available to programme graduates cover the entire value chain of BME, namely research and development, manufacturing, quality assurance, consultancy, distribution and sale, clinical engineering, regulatory affairs and entrepreneurship in technology. Graduates are also well equipped to pursue advanced study in engineering and biomedical sciences. Some graduates are also pursuing their careers in business, law and medicine.



Ng Wing Yin, Ben

2019 BEng (Biomedical Engineering) graduate

Research Assistant, The Chow Yuk Ho Technology Centre for Innovative Medicine, CUHK

When I had to declare my major program (as a Year 1 broad-based Engineering student), I quickly chose BME as my first priority. And it turns out that this choice was definitely correct. As an interdisciplinary program, BME provides knowledge not only for engineering, but also knowledge of how to relate engineering techniques to real medical problems. We can study multiple fields of BME such as biomaterial, medical robotics, and neuroengineering etc. All these have broadened our horizon on cutting-edge biomedical techniques.

Now, I am a research assistant of the Chow Yuk Ho Technology Centre for Innovative Medicine, CUHK, focusing on soft robot control and development of endoscope. The undergraduate study in BME has equipped me with a solid foundation in

engineering and medical science, and chances of exploring different interesting topics. These help me to be more well-prepared for my current research, and even my possible future study.



Shyngys Moldir

Biomedical Engineering student (Year 3)

I vividly remembered being asked what would make me think BME is different from other engineering and sciences majors in an admission interview. I took a deep breath and believed biomedical engineering incorporate a wide range of sciences disciplines including physics, mathematics, chemistry and biology.

In my first year of study in CUHK, I gained a priceless experience through summer training in hospital, medical devices companies and various local university laboratories. It was so wonderful that I was offered something more than pure knowledge but continuous inspiration, motivation and practical use. I also met many new friends from all different regions like South Korea, Kyrgyzstan, Bangladesh, Kazakhstan, India and many others.



ELECTRONIC ENGINEERING

The Department of Electronic Engineering was established in 1970 by Late Prof. Charles Kao, former Vice-Chancellor of CUHK and a 2009 Nobel Laureate who pioneered the use of optical fibres in communications. The Electronic Engineering programme (JUPAS code: JS4434) features a dynamic and adaptive curriculum that covers a wide range of topics, including integrated circuits and electronic devices, optoelectronics and optical communication, microprocessors and computer architecture, telecommunication and wireless systems, multimedia and signal processing, medical instruments and telemedicine, electronic materials, and nanotechnology. The courses offered are designed to convey both theoretical and practical knowledge and provide balanced training in both hardware and software skills. The department was ranked No. 1 in Hong Kong according to the QS World University Rankings by Subject 2016 and the Shanghai Ranking's Global Ranking of Academic Subjects 2017.

Programme Features

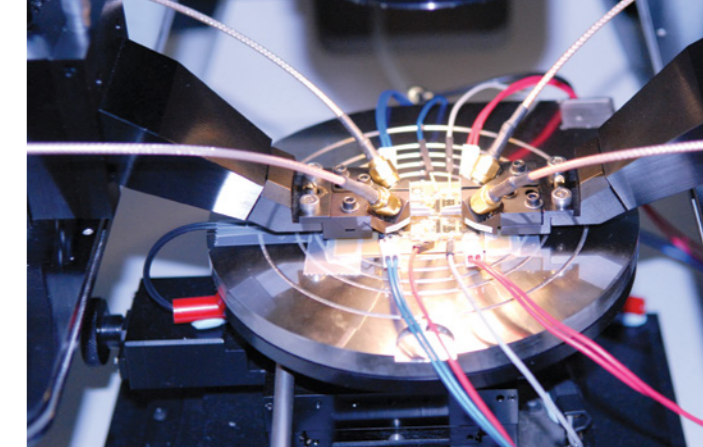
The Electronic Engineering (EE) Programme provides the broadest and most foundational engineering training for modern society and generates rewarding career opportunities. The courses EE offered are designed to convey both theoretical and practical knowledge and to provide balanced training in both hardware and software skills. The major topics of study include:

- Integrated circuits
- Wireless and microwave engineering
- Digital signal processing and communications
- Multimedia technology
- Semiconductor devices and nanotechnology
- Photonics and optoelectronics
- Medical devices and systems

The work-study scheme in the Electronic Engineering programme allows students to spend one year working full-time in selected electronics or IT companies. Under the Personal Tutor scheme, professors meet regularly with students to provide advice on their academic and personal development. Thanks to the generous support and patronage of professional societies, local industry and distinguished alumni, the department is able to offer a large number of scholarships to our undergraduates.

Career Prospects

Programme graduates pursue successful careers in a wide range of hi-tech industries and business sectors including telecommunications, computer hardware, information technology, e-commerce, technology services, industrial manufacturing, and product design and development. Some of the graduates also choose to pursue postgraduate studies in local or overseas institutions.



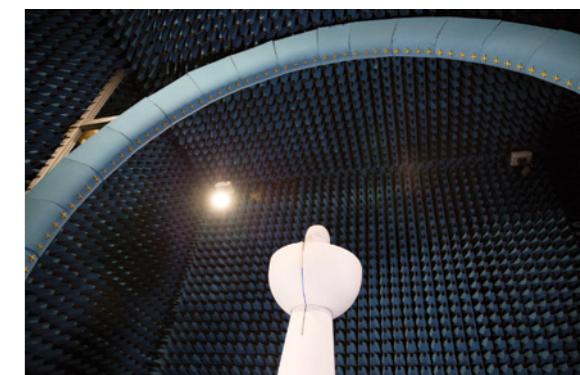
Chan Joi Hei, Joshua

2017 BEng (Electronic Engineering) graduate
Graduate Engineer, MTR Corporation Limited

After my graduation from CUHK EE, I embarked on the Graduate Development Programme in MTR. As a Graduate Engineer, I am privileged to obtain ample opportunities in developing the managerial skills and technical knowledge ranging from maintenance strategies for rolling stocks and infrastructure to the stringent design criteria for different engineering systems during the 2-year cross-functional rotation. The past holistic training in CUHK EE helps me pick up new knowledge in workplace more quickly and comprehensively to embrace the cutting-edge technologies and proactively propose value-added solutions in a pursuit of delivering a safe, reliable and efficient railway service to Hong Kong's commuters.



I used to think that engineer was simply a career. It now turns out that engineer to me is a meaningful job carrying the commitment of shaping a better society and a better world.



ENERGY AND ENVIRONMENTAL ENGINEERING

The Energy and Environmental Engineering programme at CUHK provides students with the engineering knowledge and training needed to tackle a broad spectrum of energy issues pertaining to sustainable, environmental and building technologies. The programme provides a strong platform and broad-based perspective for learning and understanding the relations and trade-offs between energy and environment, and the ensuing engineering challenges to attaining viable solutions.



Programme Features

Interdisciplinary by design, the Programme strongly leverages the relevant expertise and capabilities offered by CUHK as a comprehensive university. In addition to the fundamental knowledge of energy principles, technologies and systems, the Programme features a number of required and core elective courses co-designed with the Earth System Science Programme and the School of Architecture, and a host of elective courses from the Environmental Science Programme and the Department of Geography and Resource Management, for a broader and in-depth education on the environmental impact of pollution in urban settings. Students are able to pursue any one of the three streams of study according to their personal and career interests: the Sustainable Energy Technology stream for enhanced coverage of renewable energy generation, system design, storage, distribution and management; the Green Building Technology stream for fundamental knowledge of environmental performance assessment and energy management of urban buildings; and the Environmental Engineering stream for principles of natural and built environments, and air pollution monitoring and control challenges.

The Programme also includes courses in technical communications, engineering ethics, design application and final year projects to enhance students' training as professional practitioners. Students are able to participate in and benefit from the many campus and community projects and research topics offered by the university-based institutes and units on environmental studies and sustainable development. They can also enjoy ample opportunities for summer internships, work-study programmes and international exchanges.

Career Prospects

The knowledge and skills gained by students of the Programme will afford them strong career prospects. They will be employable in current and emerging areas of energy systems, environmental monitoring and control, sensor instrumentation, and smart and green building technologies, among other areas. They can land jobs in government, electric companies and power grid enterprises, building and construction industries, consulting firms and green groups, renewable technology companies and vehicle industries, to cite just some of the possibilities. They can also pursue postgraduate studies in their specialized areas of interest in Hong Kong or overseas.



Wong Wai Kun, Carol

2017 BEng (Energy Engineering) graduate
Start up in business

Being a citizen of the global village, I am passionate in making a better world by energy and environmental aspect. CUHK Energy Engineering programme offers great diversity of courses which equipped me to be engineering professional. Energy, building service, environmental science and related technologies are taught and investigated in courses which are specialized and unique among the other undergraduate programmes in Hong Kong.

Participating in one-year placement has broadened my horizon and equipped me with workplace skills, which is a valuable experience. Energy and environmental problems are always the most challenging crises for the globe. As a graduate of CUHK energy engineering, I am contributing to environmental protection. The all-rounded courses not only provided me with knowledge combined with mechanical, chemical and electrical background, but also developed my creativity and problem-solving skills as an engineer. I am so glad that I have taken Energy Engineering as my major in CUHK.

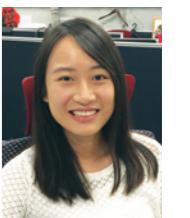


Wong Hoi Yi, Jane

2017 BEng (Energy Engineering) graduate
Graduate Trainee, CLP Power Hong Kong Limited

Energy is invisible, but you can find it everywhere. Upon the rapid growth of population and urban development, from the energy source to the process of generating and using energy effectively, all these become essential topic to me. That's why I study Energy Engineering which covers all the critical energy and environmental-related issues, such as renewable energies, battery storage, green building design and energy efficiency of electrical transmission.

Apart from the knowledge on architecture, mechanical and electronic design, the energy programme fully equips students with many hands-on experiences on the courses, solar car competition, exchange programme, internship and solid supports from the professors. After graduation, I find all these trainings and practical experience did strengthen my technical skills, so as to get the desirable job and continue to pursue my career in the engineering field.



FINANCIAL TECHNOLOGY

Financial Technology (FinTech) is an emerging engineering discipline that focuses on employing technological innovations in financial practices. Leveraging on the cutting-edge developments of engineering, in particular information technology and data sciences, it demonstrates an unprecedented potential to revolutionise the nature of traditional financial service industry in a fundamental way. Examples of FinTech developments include but are not limited to virtual banks, crowdfunding, digital currencies, and robo advisory services.

“ Technological innovations will be the heart and blood of the banking industry for years to come and if big banks don’t make most of it, the new players from FinTech and large technology companies will surely win.”

- David M. Brear

Programme Features

The mission of the FinTech programme is to educate and equip students with the essential knowledge and capabilities to apply technological innovations to financial services, and to nurture leadership and entrepreneurship for the next generation of financial talents in support of Hong Kong’s endeavor to grow into an international FinTech hub. This new programme is built upon a strong collaboration between Faculty of Engineering and Faculties of Business Administration, Law, and Social Science. It offers multi-disciplinary training, which will equip students with both solid technological education in engineering innovations and insightful understanding of the business and legal environment for FinTech. New course offerings, including Financial Infrastructures, E-Payment Systems and Cryptocurrency Technologies, Internet Finance, Financial Informatics, bring to our undergraduate education state-of-the-art developments in the field for the first time. Closely collaborating with the Hong Kong Monetary Authority (HKMA) and Hong Kong Applied Science and Technology Research Institute (ASTRI), the programme also organises internships and overseas exchange to encourage students to apply theories to practices. In addition, the programme partners with Peking University (PKU) to offer a dual degree programme in Financial Math and FinTech, in which students study for two years at PKU and two years at CUHK.

Career Prospects

Programme graduates will be ideally suited for positions that require strong quantitative and technological skills in the financial service industry. Prospective career opportunities include investment and commercial banking, insurance, asset management, Internet finance, government regulatory agencies, FinTech startups, and so on. Graduates can also pursue further advanced studies in finance, management sciences and engineering, computer sciences, information engineering and related fields. Recent internship placements include DBS, Haitong Securities, Hang Seng, HSBC, HKMA and Zhong An Insurance.

Chen Yu FinTech student (Year 4)

I participated in the internship programme jointly offered by the FinTech programme and Haitong Securities on artificial intelligence. During the internship, I applied what I have learned from courses to improve work efficiency and developed automation for some financial procedures. I was also impressed by the professional working environment and social responsibility of the company. This is a valuable experience for me.



Double Degree Option

Engineering and Business Administration Double Degree Option

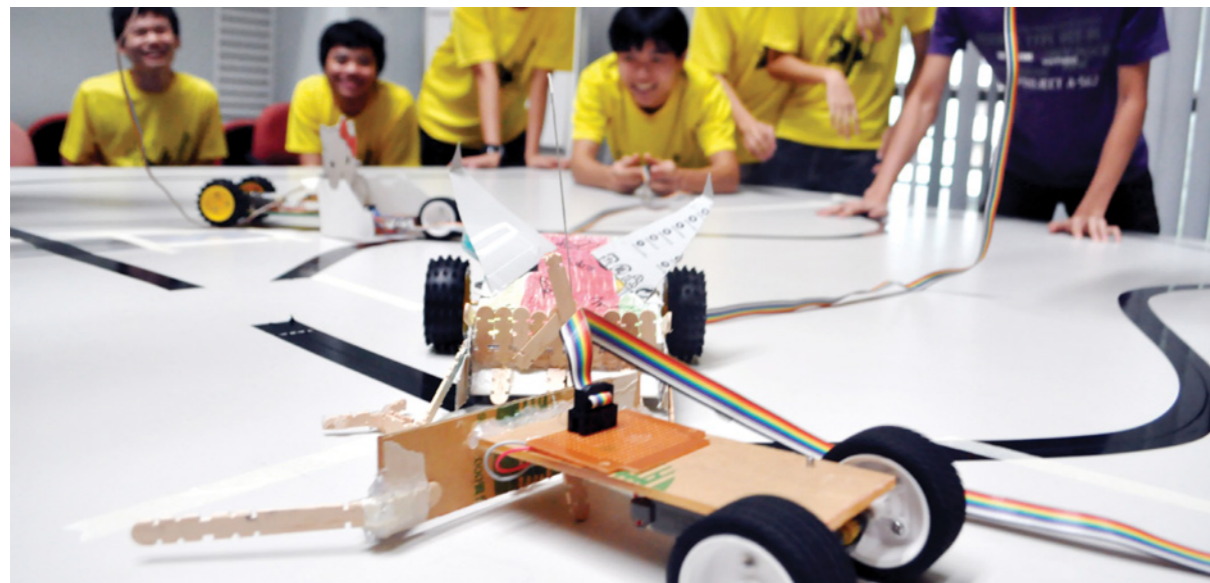
Hong Kong has transformed into a technology-enabled service economy, and the demand for engineers has changed. There are growing desires for many enterprises from small scale to large corporates like banking and finance to recruit professionals with IT and related expert knowledge. Students graduated from this double degree option will be equipped with both strong technical and business knowledge, making them extremely competitive in the job market.

Programme Structure

Eligible students could pursue their first bachelor degree at the Faculty of Engineering with a selected major (BMEG, CENG, CSCI, ELEG, EEEN, FTEC, IERG, MAEG or SEEM), and after completing the first degree, pursue the second bachelor degree at the Faculty of Business Administration for one year. Students would be awarded a Bachelor of Engineering and a Bachelor of Business Administration (BBA) in Integrated Business Administration (IBBA) upon completion of both programmes' requirements.

Programme Features

- No admission quota
- Students will first complete the Engineering degree before completing their second degree in the last year on self-financed basis. Students will need to take some Business Administration courses during the study period of the first degree.
- Students who eventually do not join the second degree in Integrated Business Administration will be awarded a Minor in Integrated Business Administration in recognition of the credit units earned from the BBA courses if they fulfill the relevant academic requirements of the IBBA Minor programme.



www.erg.cuhk.edu.hk/ergbba

Career Prospects

Graduates of the Faculty of Engineering of The Chinese University of Hong Kong have always been put on the top priority by employers. The multi-disciplinary and multi-talent training offered by the Faculty prepares its students best for a wide magnitude of career choices both in the business and government sectors. Quite a number of engineering graduates started their own business and become successful entrepreneurs. Apart from this, many of our graduates have pursued their postgraduate studies and taken up the teaching and research work in local and overseas prestigious institutions.

Job Statistics of Full-time Engineering Graduates 2019

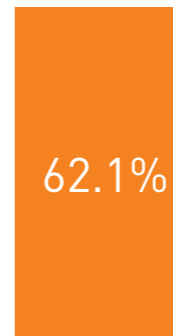
Employment Status



Career Fields

- IT: Computer Hardware & Engineering
- IT: Data Communications & Network / Internet Engineering
- IT: eBusiness
- IT: Electronic Engineering
- IT: Engineering Consultancy
- IT: Financial & Quantitative Analysis / Engineering
- IT: Information Systems Administration & Management
- IT: Multimedia & Digital Entertainment
- IT: Software Design & Development
- IT: System Solution & Services
- IT: Telecommunications
- Mechanical Engineering
- Banking / Finance / Business Consultant/ Insurance / Wealth Management
- Administration / Management
- Medical Devices & Instrumentation
- Scientific / Research Work
- Sales / Marketing / Customer Service
- Logistics / Shipping
- Teaching
- Architecture / Surveying / Construction
- Others/ Disciplined Service
- Industrial Engineering & Product Design / Manufacture
- Accounting / Auditing
- Art / Design
- Retail Management
- Hotel Management / Tourism / Catering Services

Sectors of Employing Organizations



Successful entrepreneur's story – An energetic social mobile solution company

Computer Science & Engineering graduate Louis Li is passionate about making a direct impact with his solid experience in engineering design. His team at RedSo develops new solutions to manage web-based mass queuing systems and prevent website crash due to high online traffic. The system allows operators to control traffic peaks of a website that may expect hundreds of thousands of visitors for high-demand sales events, flash sales and/or quota allocations.

"The covid-19 outbreak has made desperate crowds to crash websites for surgical masks, but I am glad my team has ultimately helped deliver smooth experience for end users. Technology does play a vital role in our life and I believe engineering is a great career changing the world in a better way" says Li. Together with his business partner Eric Ng, Louis has grown the team to over 30 employees, many of whom are also graduates of CUHK Engineering.



Admissions

JUPAS Admission

Secondary school students taking the Hong Kong Diploma of Secondary Education (HKDSE) Examination should apply for admission through the Joint University Programmes Admissions System (JUPAS). The JUPAS code of CUHK Broad-based Engineering Programme is JS4401.

Admission is based on the Best 5 HKDSE subject results with subject weighting. For details of subject weighting, please refer to the table below:

Subject	Minimum Level	Subject Weighting
Chinese Language	3	1
English Language	3	1
Mathematics	3	1.5
Liberal Studies	2	0.5
One Science subject from the following: Biology / Chemistry / Combined Science / Physics / Mathematics Extended Module 1 or 2	3	1.5 (1.75 for M1/M2, if applicable)
Preferred subjects: Biology / Chemistry / Combined Science / Physics / Information and Communication Technology / Design and Applied Technology / Mathematics Extended Module 1 or 2		Preferred subjects: 1.5 (1.75 for M1/M2, if applicable)
Any other subjects		Any other subjects: 1

In addition to the requirements above, bonus points will be awarded to the 6th and 7th subjects, if any.

Please visit <http://admission.cuhk.edu.hk/jupas> for calculation of admission scores.

2020 Admission Grades of HKDSE Examination *(for reference only)*

Subjects	CHIN	ENGL	MATH	LBST	SCI Elective	Elective 2 (applicable to M1/M2)
Lower Quartile	3	3	5	3	5	4

Non-JUPAS (Local) Admission

Local applicants holding other qualifications can apply through the non-JUPAS admission scheme. These qualifications include Associate Degree/Higher Diploma, HKALE, GCE-AL, IAL, IB, SAT/AP and other overseas qualifications for university admission. Applications will be assessed on a case-by-case basis. Please refer to the website of Office of Admissions and Financial Aid for further information.

<http://admission.cuhk.edu.hk/non-jupas-yr-1>

International Students Admission

Applicants who require a student visa to study in Hong Kong can apply through this scheme. Applicants must possess relevant high-school or post-secondary qualifications, which include GCE-AL, IAL, IB, SAT/AP, GSAT (Taiwan), OSSD (Canada), ATAR (Australia), and other relevant qualifications. Applications will be considered on a case-by-case basis. Please refer to the website of Office of Admissions and Financial Aid

<http://admission.cuhk.edu.hk/international>

Admission with Advanced Standing

A non-JUPAS (local) or international applicant may apply for "Admission with Advanced Standing" if he/she meets specific requirements with relevant qualifications (including GCE-AL, IAL, IB, associate degree/higher diploma). For students admitted with Advanced Standing, the minimum number of units for graduation may be reduced by up to 24 units (normative period of study may be shortened by up to one year).



Senior-Year Admission for Sub-degree Holders

Applicants holding the qualification of associate degree or higher diploma could apply for direct admission to senior year places. Applicants admitted to the senior year places are generally expected to complete their undergraduate studies in two years. For the 2020-21 entry, nine engineering programmes offer senior year places. They are Biomedical Engineering, Computer Engineering, Computer Science, Electronic Engineering, Energy and Environmental Engineering, Financial Technology, Information Engineering, Mechanical and Automation Engineering, Systems Engineering and Engineering Management.

Admission through National Colleges and Universities Enrolment System

Mainland students, who are current Gao Kao candidates, are welcome to apply through the National Colleges and Universities Enrolment System. Applicants may refer to the website of Recruitment of Mainland Students

<http://admission.cuhk.edu.hk/sc/mainland> for details.

Admission Scholarships

The Office of Admissions and Financial Aid, colleges, academic and administrative departments altogether offer plenty of scholarships each year. These scholarships provide not only recognition and encouragement to outstanding students, but also some financial support to needy students. The Faculty offers various entrance scholarships to newly admitted students with excellent entrance results in public exams. For the 2020 entry, about 70 students were awarded the Faculty Admission Scholarships.

Award Criteria for Admission Scholarships

For JUPAS students

Dean's Award (Remarks)		Scholarships by the University Information of 2020 entry is listed for reference. Scholarship information of 2021 entry will be announced through the Office of Admissions and Financial Aid. Website: admission.cuhk.edu.hk	
Achievements (Marks in any best 5 subjects)	Scholarships by the Faculty	Achievements	Scholarships by the University
35 marks	Cash award of \$56,000 (renewable)	Level 5** in 6 or more subjects	(i) Full Tuition (renewable); (ii) Annual Allowance of \$20,000 (renewable); AND (iii) One-off Exchange Scholarship of \$30,000
33-34 marks	(i) Half Tuition (renewable); AND (ii) Cash award of \$30,000 (renewable)	Level 5** in 5 subjects	(i) Half Tuition (renewable); AND (ii) One-off Exchange Scholarship of \$10,000
30-32 marks	(i) Half Tuition (one-off); AND (ii) Cash award of \$30,000 (one-off)	Level 5** in 4 subjects	(i) Half Tuition (one-off) (ii) One-off Exchange Scholarship of \$10,000
		Level 5** in 3 subjects	(i) Scholarship: \$10,000 (one-off) (ii) One-off Exchange Scholarship of \$10,000
		Level 5** in 2 subjects	Scholarship: \$5,000 (one-off)

Students eligible for scholarships have the opportunity to be awarded for both scholarships by the University and the Faculty. The exact amount is subject to the University regulations.



Calculation of Marks

Conversion Table							
HKDSE Level	5**	5*	5	4	3	2	1
Mark	7	6	5	4	3	2	1

Remarks:

Mathematics Extended Module 1 or 2 is counted as one subject for scholarship considerations.

For Non-JUPAS (Local) and International students

Admission scholarships will be provided to non-JUPAS (local) and non-local applicants admitted with outstanding entrance grades in public examinations such as GCE-AL, IAL, IB diploma, etc.

For Sub-degree holders

\$10,000 scholarship for students admitted to the Faculty with the qualification of "Distinction" of their Associate Degree or Higher Diploma from institutions in Hong Kong.

Faculty Office

Faculty of Engineering
Room 606, Ho Sin Hang Engineering Building,
The Chinese University of Hong Kong,
Shatin, N.T., Hong Kong
Tel: (852) 3943 8446
Email: info@erg.cuhk.edu.hk
Website: www.erg.cuhk.edu.hk



Centre for Innovation and Technology (CINTEC)

Technology Transfer | Industrial Collaboration | Incubation
Rm 601-2, Ho Sin Hang Engineering Building, CUHK
Tel: (852) 3943 8221
Email: enquiry@cintec.cuhk.edu.hk
Website: www.cintec.cuhk.edu.hk

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