

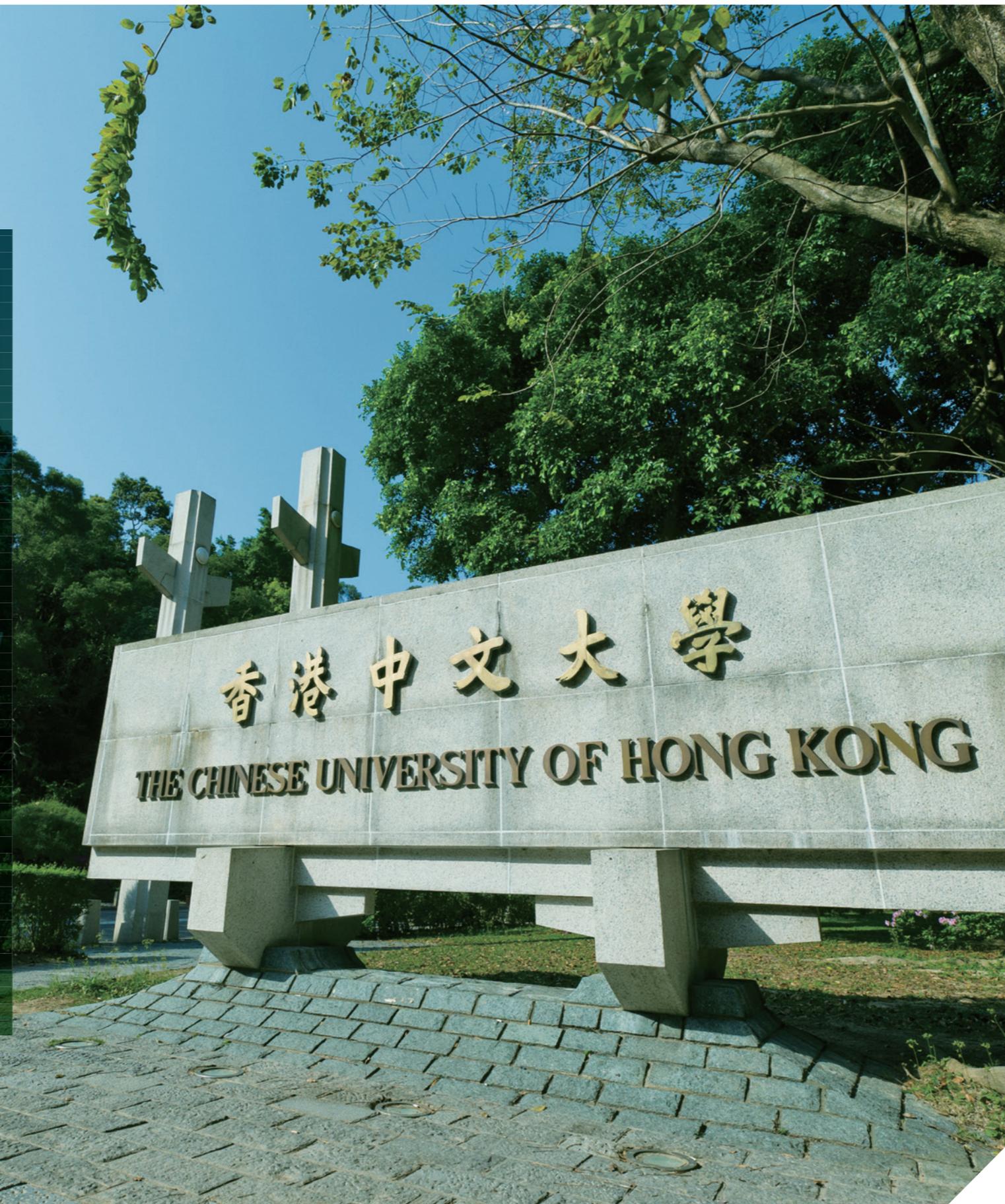
**CUHK  
2023-24**

# Engineering Today for Tomorrow

# CUHK

Founded in 1963, The Chinese University of Hong Kong (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 22<sup>nd</sup> 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

## CREATIVITY, INNOVATION AND LEARNING @ CUHK ENGINEERING

Founded in 1991 by our former Vice-Chancellor, the late Prof. Sir Charles Kao (2009 Nobel Laureate in Physics), the Faculty of Engineering has many distinguished professors, many of whom are at the forefront of their disciplines, and committed to teaching and advancing the state-of-the-art in Engineering by research.

The Faculty provides internationally accredited education programmes for our undergraduate students, and advanced research training for our research students. Currently with more than 3,000 undergraduate and graduate students, we offer a wide spectrum of academic programmes including artificial intelligence: systems and technologies, biomedical engineering, computer science and 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. Our students' learning activities go beyond the classroom and practical training in laboratories: we also offer field trips, international exchange, undergraduate summer research internship and work-study placements in industry.

The Faculty has gained recognition for its excellence in research. Our laboratories and research environment have been assessed as 4\* (world leading) by international panel of experts engaged by the Research Grants Council (RGC) in their most recent Research Assessment Exercise. Our professors work with industry to transfer knowledge and introduce new technologies which can serve the wider community and improve the quality of life and solve challenges in society. CUHK was the pioneer in Hong Kong's internet infrastructure and development. The fact that majority 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. Our professors have created many startup companies, with notable successes including SenseTime, the first Unicorn in Hong Kong 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 recent years.

Engineering lies at the core of changes in advancing the technology used in the world today. The mission of engineers is to create technologies for the betterment of mankind. The 21<sup>st</sup> century is seeing even more technological changes than the 20<sup>th</sup> century, with the accelerating changes as technology advances exponentially. The convergence of the Internet of Things, Artificial Intelligence, robotics, data science, biotechnology, materials engineering, microelectronics, autonomous vehicles, advanced manufacturing, and nanotechnology will disrupt every industry and every aspect of modern life. Engineering teaching and research excellence at CUHK will position our students to embrace the grand challenges facing the world in this century.

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

**Prof. Hon Ki TSANG**  
Interim 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

Computational Data Science  
Computer Science  
Learning Design and Technology  
Mathematics and Information Engineering  
Interdisciplinary Data Analytics + X  
Double Major Programme

### 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.

## Postgraduate Diploma

Financial Technology

## 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** (as of 30 June 2023)

**2,566** Undergraduate  
**594** Taught Postgraduate  
**910** Master of Philosophy & Doctor of Philosophy

**Staff** (as of 24 April 2023)

**138** Professoriate  
**24.5** Non-Professoriate  
**231** Research support

# 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-leading journals and conferences, and at the same time applied their research and development 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 former Vice-Chancellor Late 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.



## RGC Senior Research Fellow / Research Fellow

Prof. Raymond Yeung has been awarded the position of RGC Senior Research Fellow 2022/23 (Research and Development of Network Coding Technologies) with the support of over HK\$ 7 million from the Research Grants Council (RGC) in sponsorship of the prestigious fellowship. The award represents a great honour in recognition of Prof. Yeung's work in network coding.



Raymond Yeung

Sun Xiankai

Jonathan Choi

Prof. Jonathan Choi Chung-hang and Prof. Sun Xiankai received awards under the 2023-24 Research Grants Council (RGC) Research Fellow Scheme (RFS) in recognition of their distinguished research achievements. Prof. Choi received the award for his project, "Preclinical Translation of Spherical Nucleic Acid Nanostructures for Managing Cardiovascular Diseases" while Prof. Sun received the award

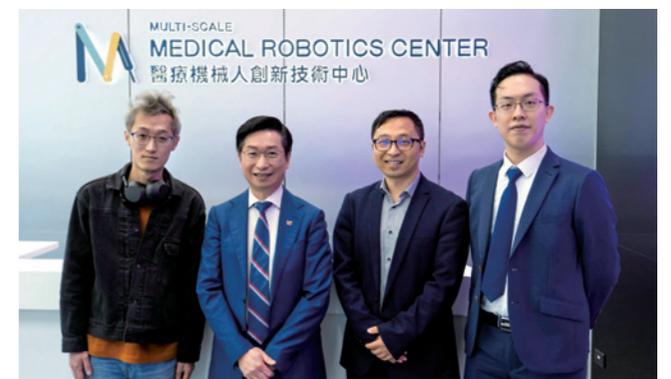
for his research project on "Phononic Integrated Circuits for Next-generation Phononic-optoelectronic Integrated Chips". They will be given the title "RGC Research Fellow" and receive a fellowship grant of about HK\$5.2 million each to support for research projects over a period of five years.

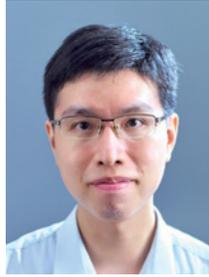
## The International Exhibition of Inventions of Geneva 2023

Prof. Raymond Tong Kai-yu and his team members won two awards in the International Exhibition of Inventions Geneva 2023. The first award is the Gold Medal with Congratulations from the jury, the Prize of Saudi Arabian Delegation with the project "A Powerful and Wearable Artificial Muscle (ExoMuscle)", and other award is the Silver Medal with the project "AR and VR TeleRehab and TeleFitness System".



Prof. Zhang Li and his cross-disciplinary team also won Gold Medal with Congratulation of the jury for the research project "RefluxChip – a Miniature, Battery-free Remote Sensing System for Real-Time Monitoring of Gastroesophageal Reflux Disease" at the International Exhibition of Inventions of Geneva 2023. This miniature, battery-free remote sensing system with an extended detection period enables real-time monitoring of gastroesophageal reflux disease in a non-invasive, inexpensive fashion.





Prof. Li Cheuk Ting has won the IEEE Information Theory Society Paper Award 2023. The paper “A Unified Framework for One-Shot Achievability via the Poisson Matching Lemma”, co-authored by Prof. Li Cheuk Ting (CUHK) and Prof. Venkat Anantharam (UC Berkeley),

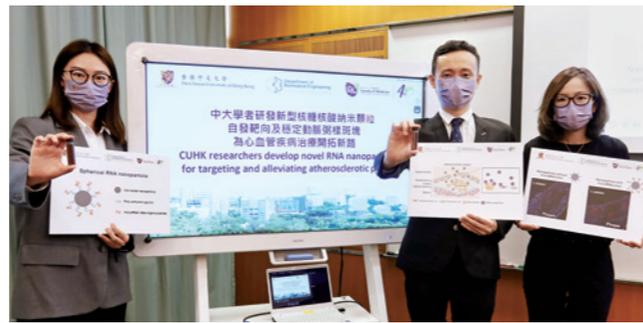
has been awarded the prestigious IT Society Best Paper Award. This marks the third time that the Department of Information Engineering has won this award, with previous wins in 2005 by Prof. Raymond Yeung for Network Coding and in 2016 by Prof. Nair for developing a new technique for Gaussian optimality.



Prof. Yu Bei, along with the alumni of the Department of Computer Science and Engineering Dr. Yang Haoyu, Mr. Li Shuhe, Miss Chen Wen, received the Best Paper Award from IEEE Transactions on Semiconductor Manufacturing 2022 for the paper “DeePattern: Layout Pattern

Generation with Transforming Convolutional Auto-Encoder”. This work is in collaboration with Cadence Inc. This paper proposed generative machine learning models to synthesize VLSI layouts through a pattern generation framework that reduces the challenging creation problem into two simpler subproblems with the aid of an efficient squish pattern representation.

A team led by Prof. Jonathan Choi Chung-hang has developed a novel RNA nanoparticle to offer a potentially safe, effective treatment for atherosclerosis. Research has shown that this RNA nanoparticle can naturally target receptors of plaque cells for delivering genes to atherosclerotic plaques, while alleviating atherosclerosis by modulating genes related to atherogenesis, consequently reducing and stabilising plaque without inducing severe toxicity.



## CUHK InnoHK Centres

InnoHK is a major initiative of the Hong Kong Special Administrative Region Government to develop Hong Kong as the hub for global research collaboration. This involves the establishment of world-class research clusters at the Hong Kong Science Park with research laboratories set up by world-renowned universities and research institutes to conduct collaborative researches. In a major contribution to

Hong Kong’s innovation agenda, the Faculty of Engineering has launched three research centres under AIR@InnoHK:

- Centre for Perceptual and Interactive Intelligence
- Hong Kong Centre for Logistics Robotics
- Multi-Scale Medical Robotics Centre



Prof. Chen Shih-Chi has been elected as a Fellow of Optica (formerly OSA) in 2022/23 for his seminal contributions in microfabrication and imaging based on novel manipulation of nonlinear light pulses. Prof. Chen has also been elected as a Fellow of the American

Society of Mechanical Engineers (ASME) in 2022/23 for his exceptional engineering achievements and contributions to the engineering profession and to ASME.



Prof. Liu Yunhui was awarded the Leader of the Year 2022 in the Education / Professions / Technology & Innovation category by Sing Tao News Corporation Limited for his significant contributions to Hong Kong. This annual event has been established with the aim of

recognizing and encouraging the achievements of Hong Kong’s finest individuals who have made outstanding contributions towards Hong Kong’s success and prosperity, linking it to mainland China and the international community.

Prof. Wong Kam Fai and his team won the First Prize of “Qian Weichang Chinese Information Processing Science and Technology Award 2022” of the Chinese Information Processing Society of China (2022 年中國中文資訊學會科學技術獎：“錢偉長中文資訊處理科學技術獎”一等獎) with the project on “Multilingual social media analysis technology development and industrialisation for the Guangdong-Hong Kong-Macao Greater Bay Area”.

This award is organised by the Chinese Information Processing Society of China (中國中文資訊學會), which is the highest science and technology award in the field of Chinese information processing awarded to researchers who have made major innovations and breakthroughs in this field.



# 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 active participation 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.

A Year 2 undergraduate Biomedical Engineering student, Jarinyagon Chantawannakul, has been awarded the Vice-Chancellor's Scholarship for Excellence in recognition of her outstanding achievements. "The scholarship recognises my past accomplishments, financially supports my educational pursuits, and opens me up to new opportunities. Although my career path is still unclear, I am sure I will work in the biomedical community," remarked Jarinyagon.



Although my career path is still unclear, I am sure I will work in the biomedical community," remarked Jarinyagon.

CUHK Asia Supercomputer Community (ASC) team won the Virtual Group Champion as well as the Group Award and Application Innovation Award in the ASC22 Student Supercomputer Challenge. There were over 300 competing teams in the preliminary, with 24 teams advancing into the finals, and team members were challenged to fine-tune and to improve industry benchmarks, software for computational physics, and large language models. Our competing team included members from AIST and CSC1 programmes.

The ASC Student Supercomputer Challenge stands as the world's most extensive competition in student supercomputing, expertly organized and sponsored by the ASC with support from esteemed institutions and experts across Asia, Europe, and America. ASC's primary goals encompass fostering international exchange and training for budding supercomputing talents, enhancing applications and research capabilities in the field, propelling the advancement of supercomputing technologies, and stimulating technical and industrial innovation.



An entrepreneurship team led by a Year 4 undergraduate Biomedical Engineering student, Chang Hing Lam Maurice, won the Champion of The Vice-Chancellor's Cup of Student Entrepreneurship Boot Camp (VCCE) 2023. A total amount of up to HK\$50,000 Project Development Fund has been given to assist the team in refining their project over a 6-month period. They founded a start-up company named Mindplus AI and use AI to help streamline the eye diagnosis process, tackling prominent issues such as handling low quality optical coherence tomography scans and improving early pathology detection.



eye diagnosis process, tackling prominent issues such as handling low quality optical coherence tomography scans and improving early pathology detection.

Miss Li Hang, an outstanding EE undergraduate student, was awarded the IET Prize 2022. Presented by the Institution of Engineering and Technology (IET) Hong Kong, the IET Prize recognizes students who have outstanding academic results and are active in extra-curricular activities, engineering institutions, and community service. The IET Prize delivers the IET's vision by underpinning the mission of: to inspire, inform and influence the global engineering community, supporting technology innovation to meet the needs of society.



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## Faculty of Engineering Robotics Team

The Engineering robotics team of the Faculty of Engineering received the Grand Prix Award at the Asia-Pacific Broadcasting Union's Asia-Pacific Robot Contest (ABU Robocon) in 2022. It was the second time CUHK took the award. Since ABU Robocon's inception in 2002, CUHK robotics team has advanced to six finals (2016, 2019, 2020, 2021, 2022 and 2023) of this international trophy, and in 2019 became the first Hong Kong team to win the championship.

CUHK robotics team triumphed in 2023 contest again. The team "The Lord of the Rings" got the Championship and Best Engineering Awards in the Robocon 2023 Hong Kong Contest, which is the 3<sup>rd</sup> triumph in three consecutive years! The team was selected to represent Hong Kong in the ABU Robocon after winning the championship at the Robocon 2023 Hong Kong Contest, and won the 1<sup>st</sup> Runner-up and Best Design Award in ABU Robocon 2023.

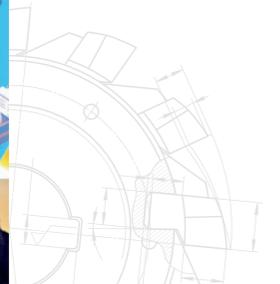


Two teams comprising three undergraduate students of Mechanical and Automation Engineering, Lam Yan Tung, Chian Hiu Ying, Yan Jiayin, and two

students of Energy and Environmental Engineering, Tsang Kit Yi and Yung Choi Yam received Second Prizes in the 3<sup>rd</sup> Guangdong-Hong Kong-Macao Undergraduate Engineering Practice and Innovation Ability Competition (UEPIAC) held on 25-26 March 2023 in Guangzhou.

Hosted by the Department of Education of Guangdong Province, the UEPIAC is a comprehensive ability competition for undergraduate students among universities in Hong Kong, Guangdong and Macau. It provides a platform for students to apply their engineering knowledge in real applications.

The CUHK team, which consisted of SEEM and FTEC students (Tong Kwan Ho; Ng Tsz Wing; Yip Pui Yan; Xue Feiyang; Hur Juhee) supervised by Prof. Daniel Long, has won the 2<sup>nd</sup> Runner-up in the CILTHK Student Day competition. The SEEM/FTEC team has tackled and presented the topic "How have the COVID-19 pandemic and Russia's invasion of Ukraine been reshaping the global seaborne trade routes of the energy commodity market?"



Prof. Chau Sze-yiu's team has been awarded the Best Paper Award at the 16<sup>th</sup> ACM Conference on Security and Privacy in Wireless and Mobile Networks organized by the Association for Computing Machinery (ACM). The paper, titled "The Devil is in the Details: Hidden Problems of Client-Side Enterprise Wi-Fi Configurators," is co-authored by a MPhil student Wu Ka-lok, two undergraduate students Hue Man-hong, Tang Ka-fun, and Prof. Chau Sze-yiu. This recognition is a testament to the team's hard work, dedication, and expertise in the field of wireless and mobile network security.

# 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 coursework and invaluable extra-curricular activities. The award of the ELITE Stream to qualified students will be officially recorded on the 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: <https://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.



## KEI Yat Long

### Financial Technology under ELITE Stream

As a local citizen living in Hong Kong, the international financial centre, bringing the latest technology to the financial service industry is one of my biggest interests. Therefore, I am grateful to enter the CUHK Fintech program, which lets us explore a wide range of knowledge, such as investment science, Fintech regulation policy, and machine learning. Besides the theoretical knowledge learned in lectures, I also obtained hands-on technical experience in project-based courses. Moreover, the fruitful experience of participating in the ELITE stream let us explore more in the research field with the additional challenging coursework. Through various extra-curricular activities, not only can we build connections with people in different areas but also sharpen our leadership and teamwork skills.



## WOO Pui Yung Anna

### Mathematics and Information Engineering under ELITE Stream

The program equipped me not only with solid engineering knowledge but also with problem-solving skills and abilities to generate innovative solutions. The ELITE stream also played an important role in my education. The ELITE courses were challenging and stimulating; e.g., some required me to learn a topic of my choice and give a presentation on it. Furthermore, I met many brilliant ELITE classmates. We exchanged ideas and also taught and motivated each other. Besides, I was provided with various experimental learning opportunities, e.g., research internships and a summit. I am super grateful to the program and the faculty for their support and education.



## 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 student exchange programmes with world-renowned 280 partner institutions in more than 35 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.



Caption: Professor Charles K. Kao and Lady Kao met the scholars at the inaugural ceremony of CUHK Professor Charles K. Kao Scholars Association.

## NGUYEN Hoang Son

### Artificial Intelligence: Systems and Technologies Recipient of Professor Charles K. Kao Research Exchange Scholarship

In 2023, I participated in a summer internship at School of Electrical Engineering and Computer Science at Oregon State University (OSU), Corvallis, U.S.A. The internship was inspiring for me as a young researcher, during which I was introduced to new research directions in data science and matrix factorizations. The experience of working on these interesting problems gave me new pointers on what future career path to pursue. However, the loveliest part of the trip was spending time with the welcoming people of Corvallis. I will always remember the trip to Silver Falls State Park



with other OSU students, or late-night BBQ under the stars with my lab mates, or a daytrip to an Oregon beach to have a look at Pacific Ocean from the other side for the first time in my life. The trip reminds me of how vast both the academic world and the actual world are, and that there is a lot more out there waiting for my future self to see.



## GLOBEX Summer Programme@PKU

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

## MA Daliang

### Financial Technology

The program's commitment to fostering cross-cultural understanding, academic excellence, and experiential learning is commendable. I am confident that the insights gained and the skills honed during this program will be invaluable in my future endeavors and contribute positively to the advancement of intelligent manufacturing and data science. As I reflect on

this journey, I am filled with gratitude for the opportunity to be a part of the GLOBEX Program, and I look forward to applying the knowledge and experiences gained in making a meaningful impact in the world of intelligent manufacturing.



## 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 nurtures 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 majors or minor programmes according to their orientations and interests 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 fostering their future career development, the Faculty has initiated 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 recruitment talks, technology seminars and workshops periodically such that students can keep abreast of the industrial trend.

## List of selected companies and organizations participating in the PIP

- ASMP Technology Hong Kong Limited
- China Mobile International Limited
- CITIC Telecom International CPC Limited
- CLP Holdings Limited
- Computer And Technologies Holdings Limited
- Deloitte Touche Tohmatsu
- GP Electronics (HK) Limited
- HKT Services Limited
- Hong Kong Air Cargo Terminals Limited (Hactl)
- Hong Kong Aircraft Engineering Co. Ltd. (HAECO)
- Hong Kong Applied Science and Technology Research Institute (ASTRI)
- Hong Kong Deposit Protection Board
- Hong Kong Disneyland
- Hong Kong Monetary Authority
- Huawei Technologies Co., Ltd.
- IBM
- Jane Street Group, LLC
- JPMorgan
- Microsoft Corporation
- Morgan Stanley
- MTR Corporation Limited
- PwC
- TENCENT
- The Hong Kong Jockey Club
- The Hongkong and Shanghai Banking Corporation Limited
- The Hongkong Electric Co. Limited
- The Hospital Authority
- The Jardine Engineering Corporation Limited
- VTech Telecommunications Limited



For more information, please visit the website of PIP:  
<https://pip.erg.cuhk.edu.hk>

# Undergraduate Programmes



Starting from the 2022 entry, the Faculty of Engineering has adopted programme-based admission, which enables our undergraduate students to enjoy greater flexibility in planning their study pathways. Prospective students can apply for any of the following undergraduate programmes through the JUPAS and non-JUPAS admission routes.

- Artificial Intelligence: Systems and Technologies (JS4468)
- Biomedical Engineering (JS4460)
- Computer Science and Engineering (JS4412)
- Electronic Engineering (JS4434)
- Energy and Environmental Engineering (JS4462)
- Financial Technology (JS4428)
- Information Engineering (JS4446)
- Mechanical & Automation Engineering (JS4408)
- Systems Engineering & Engineering Management (JS4458)

#### Four Interdisciplinary Programmes

- Computational Data Science (JS4416)
- Learning Design and Technology (JS4386)
- Mathematics and Information Engineering (JS4733)
- Interdisciplinary Data Analytics and X Double Major Programme (JS4760)

**'Predicting the future isn't magic, it's artificial intelligence.'**

– Dave Waters

# Artificial Intelligence: Systems and Technologies

## 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 across multiple disciplines, such as finance, medicine, manufacturing, robotics, multimedia, telecommunications, computational linguistics, etc. Yet there are still 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 this technology incurs.

The Artificial Intelligence: Systems and Technologies (AIST) programme aims to equip students with the skills needed to design and implement AI systems and technologies that can analyse, reason, and infer knowledge from big data, supported by a rigorous foundation of mathematics, basic sciences, data structures, statistics, algorithms, distributed computing, etc. These skills enable students to develop cutting-edge AI solutions that are of practical use to academia, industry, and society.

The AIST programme emphasizes fundamental mathematics, sciences and theories; and complements this knowledge with practical systems skill sets. Four optional specialized streams are offered for students to choose from, according to their personal 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 the tremendous current demand for well-trained talents in AI and related specializations. There is now a shortage of AI specialists in both local and global employment markets. According to the Innovation and Technology Bureau, the HKSAR Government's policies for 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. Equally, AI specialists are top among the 15 emerging jobs in the USA, with an annual growth of 74% in demand, according to a 2020 LinkedIn Emerging Jobs Report. For these reasons, CUHK aims to train talented AI engineers and scientists across the following industries: biomedical engineering and science; information and computing technologies; manufacturing and robotics; and intelligent 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	Customer Success Specialist	34%

Source: LinkedIn Emerging Jobs Report (2020).

## CHIU Long Him

2023 BEng (Artificial Intelligence: Systems and Technologies) graduate  
Start-Up Founder

During my enriching journey at CUHK, I have created cherished memories and embraced numerous opportunities that have profoundly shaped me. As a member of the pioneering batch of the AIST program, my fellow classmates and I encountered uncertainties, yet we discovered abundant pathways for personal and academic growth. The close-knit community within our major fostered strong bonds with classmates and underclassmen, enabling us to forge lasting connections.

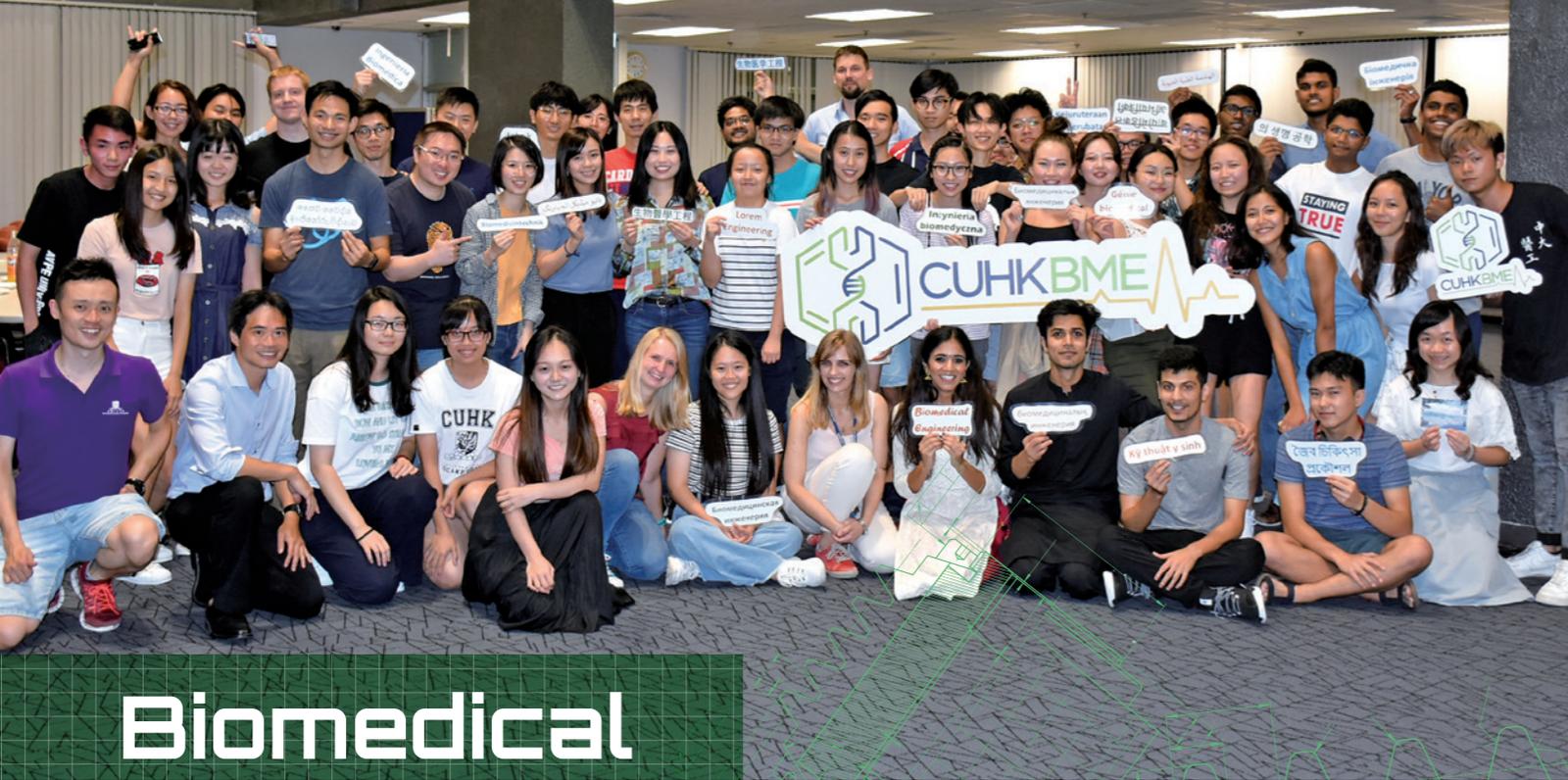
Thanks to the invaluable connections and knowledge I have gained at CUHK, I have been able to apply my academic expertise in AIST to successfully launch and operate my own startup with some CSE friends I met in the programme. This university has played a pivotal role in shaping my career path and creating opportunities for personal growth. The resources provided by CUHK, especially the PI Centre and EPIN, have contributed significantly in our



achievements. With support from CUHK, we have been able to transform our aspirations into reality. I will be forever grateful for the transformative experience and lifelong connections I have gained during my time at CUHK.

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- 🌐 [www.cse.cuhk.edu.hk/aist](http://www.cse.cuhk.edu.hk/aist)

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



# Biomedical Engineering

## Introduction

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 (BME) programme is offered by the Faculty of Engineering in extensive collaboration with the Faculty of Medicine. Students not only benefit from an education conducted 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.

## Programme Features

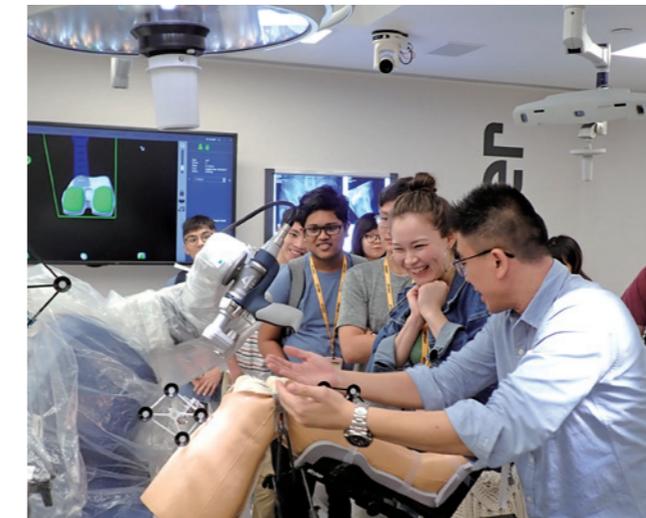
The programme's specialty areas are:

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



## Career Prospects

BME graduates work in hospitals, universities, government departments, and 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 also pursue careers in business, law and medicine.



SZE Hoi Kuen Patrick



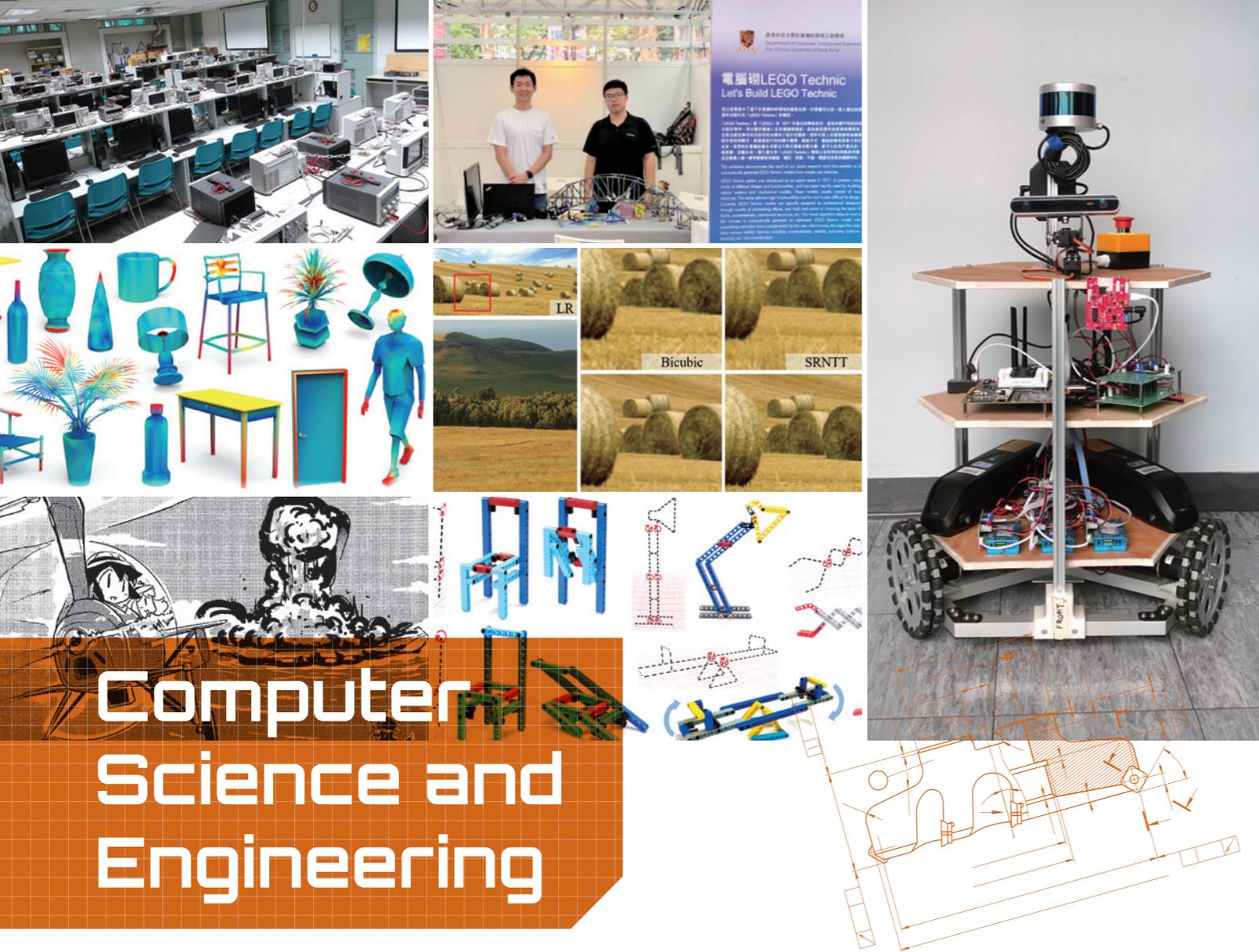
2023 BEng (Biomedical Engineering) graduate  
Engineering Assistant in Kowloon Central Cluster of Government Hospitals

The BME program is all about using engineering principles and techniques to solve real-world problems. As CUHK BME students, we're strong and equipped with everything a biomedical engineer might need. From studying biology, mathematics, physics, and medical knowledge, as well as gaining hands-on lab experience and programming skills, we're well-prepared for the exciting challenges that lie ahead!

In BME, we get to work on a variety of projects with professionals from different disciplines. By applying engineering in the medical field, we can even create our own biosensor! We also get to learn about medical devices, from their working principles to device regulations. CUHK BME has a strong research focus, with cutting-edge projects that have real-world applications. We're always given opportunities to participate in research projects and gain hands-on experience in the field.

Despite the challenges brought on by COVID and online learning, my university life has been incredibly fulfilling. During my Year 3 study, I had an amazing opportunity to participate in a three-month research internship at the University of Technology of Troyes in France. It was an unforgettable experience to work in the French National Standard research lab, surrounded by experts in optics and quantum mechanics!

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# Computer Science and Engineering

## Introduction

From 2022-23, students can be directly admitted to the Department of Computer Science and Engineering (CSE) through “department-based” admission. Upon completing the first year of study, CSE students will be invited to declare their major in Computer Engineering (CENG) or Computer Science (CSCI). Students with outstanding HKDSE results and good academic performance in their first year of study are guaranteed their first choice of major.

## The Computer Engineering (CENG) Programme

The CENG programme was formally established when the Faculty of Engineering was inaugurated in 1991, with an emphasis on both computer hardware and software. Our CENG 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. The CENG curriculum consists of courses in many 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 structure, operating systems, algorithm, software engineering;
- Very large-scale integrated circuit (VLSI) design: Computer-aided design and applications; and
- System connectivity: computer network; etc.

For more details, please visit <https://www.cse.cuhk.edu.hk/admission/cengn>

## The Computer Science (CSCI) Programme

The CSCI programme is the first computer science programme in Hong Kong, launched for more than 40 years. It is accredited by the Hong Kong Institution of Engineers (HKIE) and has gained an international reputation for excellent research and teaching. Overall, the CSCI programme focuses more on software innovation and aims to train students with a flexible curriculum that covers diverse and specialized areas such as 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, and theoretical computer science.

For more details, please visit <https://www.cse.cuhk.edu.hk/admission/cscin>

## 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, The Hongkong and Shanghai Banking Corporation Limited (HSBC), Apple, Deloitte, Facebook, Google, IBM, Intel, Microsoft, Yahoo, and various investment banking institutes. 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 chosen to further their studies in our postgraduate programme or programmes in internationally renowned universities overseas.

**‘Those who can imagine anything, can create the impossible.’**

– Alan Turing

## CHAO Yu

2020 BSc (Computer Science) graduate  
Software Engineer, Google

Most tech companies nowadays look for candidates with good algorithmic problem-solving skills, so I regard “Data Structures” (CSCI2100) and “Design and Analysis of Algorithms” (CSCI3160) as the two most essential courses in CS. Though the courses were very challenging and time-consuming, it made me comfortable in translating algorithmic ideas into actual working programs. CSCI3160 laid down the theoretical foundations and made me excel in analyzing the time and space complexities.

“Operating Systems” (CSCI3150), “Database” (CSCI3170), “Programming Languages” (CSCI3180) and “Computer Networks” (CSCI4430) are equally important; they came up a lot during knowledge-based interviews. I’m now working in Google’s Android Pixel team, topics from these courses still often pop up during my day-to-day job.



The courses offered by the CSE department give a solid foundation on both the practical and theoretical sides of CS. As the software industry becomes increasingly competitive, I feel quite lucky that I’ve undergone such rigorous academic training.

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# Electronic Engineering

## Introduction

The Department of Electronic Engineering was established in 1970 by the late Professor Charles Kao, former Vice-Chancellor of CUHK and a 2009 Nobel Laureate, who pioneered the use of optical fibres in communications. Our mission is to educate students to enhance their potential to become global leaders in electronic engineering and instil in them the desire to pursue knowledge and take electronic engineering into the future. This includes hardware, software, and design aspects of electronics as the core, ranging from materials, devices and circuits to systems and their applications for the betterment of humanity. The department's Bachelor of Engineering (BEng) honours degree is accredited by The Hong Kong Institution of Engineers (HKIE).

## Programme Features

The Electronic Engineering (EE) programme provides a broad and foundational engineering training course for modern society and generates rewarding career opportunities.

The courses in the EE programme are designed to develop 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 and machine learning
- Semiconductor devices and nanotechnology
- Photonics and optoelectronics
- Robotics, perception, and artificial intelligence

The work-study scheme of the Department of Electronic Engineering 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 high-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.

### DENG Piao



2023 BEng (Electronic Engineering) graduate  
Master student, Stanford University

During my undergraduate studies, I was fortunate to obtain an opportunity to participate in a research project on using millimeter wave radars to sense the water level in the drainage system, under the supervision of a world renowned professor. In this project, I got the chance to familiarize myself with the operation principle and signal processing algorithm of the Frequency Modulated Continuous Wave radar technology, as well as valuable hands-on experience with programming the millimeter wave radar and designing the peripheral circuits for the radar to operate. The comprehensive education I received from CUHK EE facilitated me with a solid foundation to carry out the research and design of the software as well as the hardware required for the project.

In the future, I wish to contribute to the development of hardware accelerators and hardware-software co-design to create more efficient and higher-performance computers.

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**'Art without engineering is dreaming. Engineering without art is calculating.'**

– Steven K. Roberts,  
author of *Computing Across America*

**'At EEEN, we do both art and engineering.'**

# Energy and Environmental Engineering

## Introduction

The Energy and Environmental Engineering (EEEN) 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 in 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 a fundamental education in energy principles, technologies and systems, the programme features a number of required and core elective courses co-designed with the Earth and Environmental Sciences Programme and the School of Architecture, and a host of elective courses from other Programmes including the Department of Geography and Resource Management, for a broader and more in-

depth grounding in 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 aspiring professionals. Students are able to participate in and benefit from the many campus and community projects and research topics offered by the university-based institutes as well as units on environmental studies and sustainable development. They 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 afford them strong career prospects. Students are 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 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 also pursue postgraduate studies in their specialized areas of interest in Hong Kong or overseas.

### HO Ka Chun, Gordon



**2022 BEng  
(Energy and Environmental Engineering) Graduate  
Graduate Trainee, CLP Holdings Limited**

Climate change and the energy crisis are the most pressing concerns of our times, but the ongoing development of new technologies gives us hope to combat them. Combining different facets of the energy and environmental industry, the EEEN programme offers a professional pathway to the sustainability field. I decided to study EEEN because of the tremendous opportunities and market needs for talents in the field. With cross-multidisciplinary courses, internships, competitions, and career-sharing sessions, I have gained not only textbook knowledge but also in-depth industry insights. The hands-on experiences in architecture, mechanical, and electronic design have equipped me to contribute to energy transition in Hong Kong after joining CLP Holdings Limited as a Graduate Trainee.

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### YEUNG Sze Hang, Candy



**2022 BEng  
(Energy and Environmental Engineering) Graduate  
Graduate Trainee,  
ATAL Building Services Engineering Limited**

EEEN is a holistic programme that covers not only textbook theory but also physical industry training. It gives us autonomy and support in academics, allowing us to progress our careers and pursue our dreams. EEEN provides diverse and in-depth course options for students to explore different fields both within and outside of the engineering industry and equips us to become professional consultants and engineers. I would like to thank my professors and all the amazing people that I have met at EEEN. The opportunities I had here have prepared me to become a Graduate Trainee at ATAL Building Services Engineering Limited. In the future, I hope to continue to make substantial contributions by applying what I have learned at EEEN to make our community a better place.





**'The major winners will be financial services companies that embrace technology.'**

– Alexander Peh, PayPal and Braintree.

# Financial Technology

## Introduction

Financial Technology (FinTech) is an emerging engineering discipline that focuses on applying technological innovations to financial practices. Leveraging cutting-edge developments in engineering – in particular information technology and data sciences – FinTech represents an unprecedented opportunity to revolutionize the nature of traditional financial service industry at all levels. Examples of FinTech developments include virtual banks, crowdfunding, digital currencies, and robo-advisory services – with many more applications constantly developing.

## Programme Features

The purpose of the FinTech programme is to educate and equip students with the essential knowledge and capabilities they need 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 endeavour to grow into an international FinTech hub.

This programme is built upon a strong collaboration between the Faculty of Engineering and the Faculties of Business Administration, Law, and Social Science. It offers multi-disciplinary training to equip students with both a solid technological education in engineering innovations

and a comprehensive understanding of the business and legal environment for FinTech. New course offerings, including Financial Infrastructures, E-Payment Systems and Cryptocurrency Technologies, Internet Finance, and Financial Informatics, bring state-of-the-art developments in the field to our undergraduate education programme 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 theory to real-world cases. In addition, the programme offers a double major programme in FinTech-IBBA with the Faculty of Business Administration, as well as a dual degree programme in Financial Mathematics and FinTech with Peking University.



## CHEN Yu

2021 BEng (Financial Technology) graduate  
Global Markets Engineering Analyst  
Goldman Sachs

I chose FinTech as my major because it allowed me to take courses from two different disciplines. During my four years on the FinTech programme, I acquired a wide range of knowledge, from pricing techniques for financial derivatives to cyber security. These courses have deepened my understanding of how to deploy technological solutions in the finance world. The programme also offers fantastic internship and research opportunities, where we were able to apply what we had learned to real-life scenarios. Equipped with finance knowledge and coding capability, my classmates and I became thinkers, developers, and creators. We can predict the pain points in business and utilize software engineering to develop solutions to these problems.



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## 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, and related fields. Employers of the recent graduates include HSBC, BOCHK, Goldman Sachs, and Deloitte. Recent internship placements include DBS, Haitong Securities, Hang Seng, HSBC, HKMA, and Zhong An Insurance.

Nurturing engineering leaders for building a connected and secure smart society of the future



# Information Engineering

## Introduction

The study of Information Engineering (IE) encompasses elements of Computer Science, Electronic Engineering, Data Science, Information Security, Information Theory, Telecommunication Networking, and Artificial Intelligence, and their integration. The gained knowledge and skills will find wide applications in emerging areas such as Artificial Intelligence of Things, Big Data Analytics, B5G/6G, Cloud/Edge Computing, Computer Vision, Cryptocurrency, Industry 4.0, the Metaverse, Smart Cities, and more. The multi-disciplinary nature of our programme is what makes it unique, challenging, and rewarding. Our IE department, established in 1989 as the first IE department and remaining one of a kind in Hong Kong, is devoted to nurturing and educating engineering leaders for the information world of today and tomorrow. Our professors are dedicated educators and world-class researchers. Many of them had extensive experience with

leading research institutions worldwide before joining the department. We have a strong presence in the top-tier venues of the global scientific community, as well as strong connections within the local IT industry in Hong Kong.

## Programme Features

IE involves the generation, transmission, networking, processing, analysis, and application of information in engineering systems. Key areas of study include:

- Cyber security: applied cryptography, system security, cloud computing security, digital forensics, secure software engineering, web programming and security, blockchains, E-payment systems and cryptocurrency technologies
- Artificial Intelligence of Things: machine learning, reinforcement learning, Internet of Things algorithms, probabilistic models and inference algorithms for machine learning, AI foundation models, systems and applications

- Big data and multimedia: multimedia coding, image and video processing, web-scale information analytics, programming big data systems, data science, social media analytics
- Networked systems and applications: internet protocols and systems, building scalable internet services, Internet of things systems, mobile networking, network software design and programming, mobile/web application development
- Telecommunications: optical networks, wireless communications, analogue and digital circuits, embedded systems, switching systems, teletraffic theory, network coding, information theory, stochastic processes

Students have great flexibility to pursue their own interests and may choose to specialize in one or two of the five Streams of Specialisation - *Big Data*, *Telecommunications*, *Cyber Security*, *Networked Systems and Applications*, and *Information Science 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 practical problems. Our graduates have embarked on successful careers in companies including Morgan Stanley, PwC, Société Générale, HSBC, SmarTone, IBM, MTR, Google, and more, or have started their own businesses, overseas or locally. Each year, around 10% of our graduates go on to further study, undertaking masters or doctorate degrees both overseas and locally. Their destinations include top universities such as CMU, MIT, Stanford, UC Berkeley, Caltech, Cambridge, Georgia Tech and more.

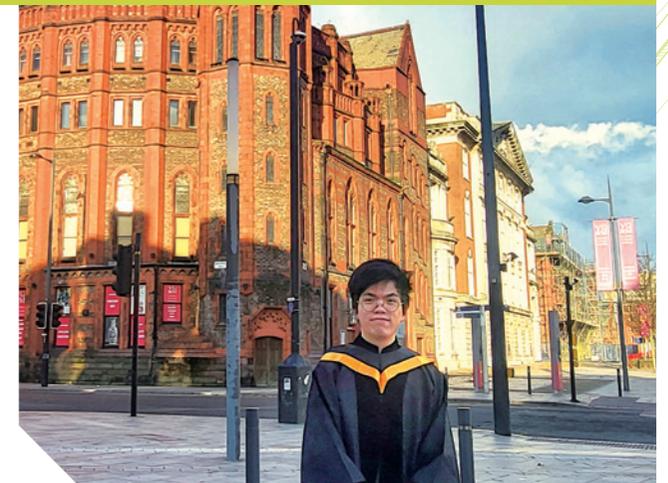
## CHAN Lok Hei Paul

2023 BEng (Information Engineering) graduate  
Graduate IT Engineer at Motorola Solutions.

My years at CUHK were truly transformational, filled with enriching experiences both inside and outside the classroom. One of my most unforgettable moments was my exchange study at the University of Liverpool. This opportunity broadened my horizons, gave me global exposure, and fostered lifelong friendships with people from diverse backgrounds.

Throughout my time at CUHK Engineering, I was constantly challenged to think critically and innovatively. The IERG program equipped me with essential skills, such as problem-solving, teamwork, and adaptability, which have proven invaluable in my professional journey.

Moreover, the supportive community of professors, mentors, and peers at CUHK Engineering played a significant role in my personal and intellectual growth. They inspired me to push boundaries and strive for excellence



in everything I do. I made the most of my time at CUHK Engineering by embracing every opportunity that came my way and never stopping my pursuit of learning. These experiences shaped me into who I am today and helped me achieve my dreams.

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*'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

# Mechanical and Automation Engineering

## Introduction

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, covering subject areas such as mechanics and materials, thermodynamics, mechanical design, manufacturing processes, mechatronics and robotics.

## Programme Features

The curriculum offers a fundamental grounding 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

choice, such as computer-aided design and graphics, robotics, mechatronics, intelligence systems, 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 future professionals. The department also provides summer internships, work-study programmes and international exchange opportunities for its undergraduate students.



## 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.

### SY Hiu Yin, Emily



2020 BEng  
(Mechanical and Automation Engineering) Graduate  
Graduate Trainee, ATAL Engineering Limited

I am grateful to CUHK, particularly the MAE department which has helped me to explore my ambitions and launch my career as an engineer. Upon graduation, I joined ATAL Engineering Limited. The MAEG programme meant I was qualified for my work of upgrading wastewater and stormwater drainage services, including but not limited to the San Wai Sewage Treatment Works and the Yuen Long Effluent Polishing Plant. For example, the knowledge I gained in the major core course 'Fluid Mechanics' has enabled me to calculate pressure drop and perform pipework sizing. In addition, my specialization in Robotics and Automation has helped me to alleviate the shortage of welders and accelerate construction by implementing a robotic arm. The MAEG programme combines mechanical engineering knowledge and programming, keeping pace with the times. It has also paved the way for me to embark on my Master of Data Science with a fellowship presented by the University Grants Committee.

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### KWAN Lok Bond, Boris



2016 BEng  
(Mechanical and Automation Engineering) Graduate  
Project Engineer, Airport Authority Hong Kong

I chose MAE as it offers unparalleled exposure within the field of engineering, ranging from classic engineering theories to the familiarisation with and application of programming and computer-aided design (CAD). The programme has allowed me to acquire all-round knowledge as well as discover my interests to further pursue after graduation.

It is evident that artificial intelligence and CAD will be hot topics in the next decade, and I consider MAE the perfect complement to these areas. This has proved to be the case, as I have decided to pursue a career with AAHK, in which engineers are required to manage mechanical systems such as the Automated People Mover and Baggage Handling System while taking the initiative in proposing innovative engineering solutions to different challenges.



*'Not enough of our society is trained how to understand and interpret quantitative information.'*

– Neil DeGrasse Tyson



# Systems Engineering and Engineering Management

## Introduction

The Department of Systems Engineering and Engineering Management (SEEM) 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.

## 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 a broad class of industries which include logistics and supply chain management, banking, healthcare system, and so on. There are three sub-areas within this specialization stream:
- Financial Engineering – emphasizes on the use of advanced quantitative techniques and information technologies to manage and execute financial 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 – combines interdisciplinary knowledge 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.

## Wisely NATALIA

2021 BEng  
(Systems Engineering and Engineering Management) graduate

Software Engineer, JP Morgan Chase

As a technology and business enthusiast, I found SEEM to be the perfect major that fits my interest and aspirations. The wide array of courses offered that tackle problems from varying industries have helped me gain a broader understanding of how the market works and the different ways we can optimize its operation. From a mathematical to management approach, SEEM has equipped me with different skill sets to solve problems from multiple perspectives. It was a rewarding experience to take this program for my undergraduate studies. I highly recommend it to fellow students who are interested in solving business problems through technical approaches!



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## Programme Overview

This new programme focuses on in-depth academic training in the domain of computational data science. It aims to equip students with the capabilities of applying both:

- (1) high-performance parallel and distributed computing for big data manipulation, and
- (2) data-driven statistical procedures, methodologies and theories for mining patterns, making predictions, and discovering sciences from large and complex datasets.

Such capabilities enable students to develop cutting-edge massive data analytics and management solutions that are of practical interest to academics, industry, and society.

## Programme Features

- Solid inter-disciplinary curriculum;
  - “Computer Science/Statistics + X” programme; and
  - Several specializations (i.e., the X component) that apply the core knowledge of computational data science to different science, engineering, and medicine disciplines:
- (a) Computational Data Science;
  - (b) Computational Physics;
  - (c) Computational Medicine; and
  - (d) Computational Social Science

## UNDERGRADUATE RESEARCH TRAINING

All students of our programme are required to take a 6-unit research-driven project course to work with professors of the University Central Cluster on real-world interdisciplinary problems. Via the project, students will learn how to formulate scientific or industrial problems into data science problems and tackle them with computational and statistical methods. As a result, our graduates will be well-prepared to join the workforce to solve practical computational data science problems upon graduation.

## LOCAL/INTERNATIONAL COMPETITIONS

A variety of non-classroom activities throughout the school year will be arranged. In particular, students are encouraged to participate in project competitions in data analytics or related disciplines, such as supercomputing contests, programming contests, Knowledge Discovery and Data Mining Cup, Microsoft Imagine Cup, etc. Through the competitions, students will learn how to address real-world problems in computational data science. Both the hands-on experience and ranking from the competitions will be a huge plus for students’ future job search and career development.

## CAREER PROSPECTS

Computational data science is a rapidly evolving interdisciplinary field that is in high demand. Future graduates will be prepared for careers that create order and derive meaning from huge amounts of data. This program prepares graduates for careers require the deep knowledge and skills of machine learning, database management, and high-performance computing with an adequate statistics background. Future alumni could work as business intelligence analysts, data-mining engineers, data modelers, data scientists, engineers and developers, data warehouse architects and research analysts, etc.

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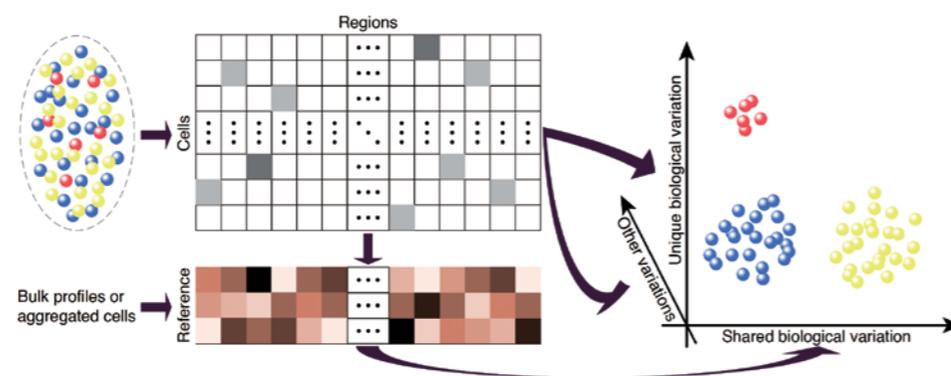
## JOINT PROGRAMME

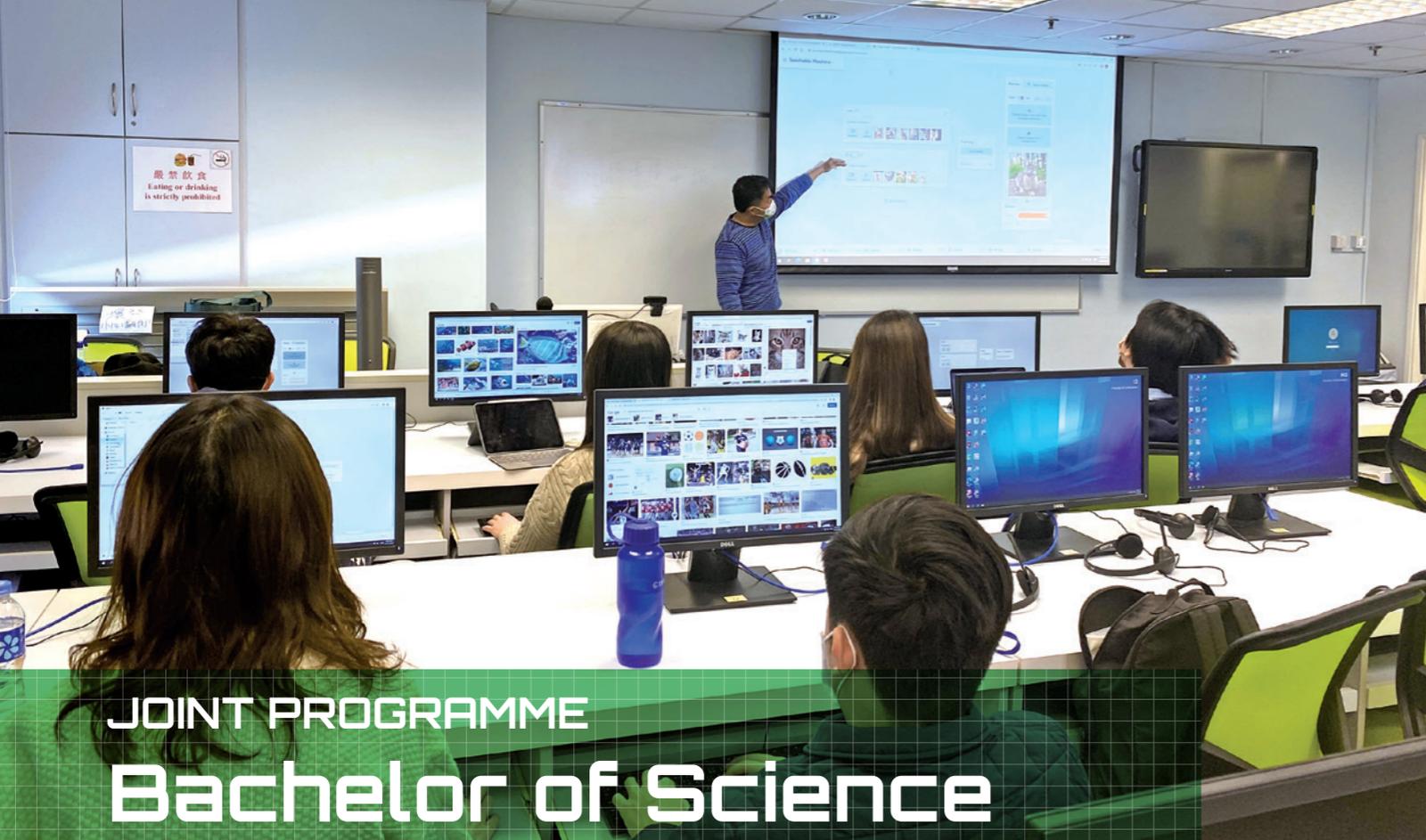
# Computational Data Science

Offered by Department of Computer Science and Engineering and Department of Statistics

## Introduction

The data-driven era creates strong interests and needs of analyzing, storing, distributing, and sharing massive amounts of data using sophisticated data analytics and machine learning algorithms and methodologies, with applications in multiple disciplines including science, social science, finance, public health, medicine, engineering, and telecommunications. Huge job demand of data analysts in both local and global employment markets has been witnessed.





# JOINT PROGRAMME Bachelor of Science Learning Design and Technology Programme

## Programme Overview

The Bachelor of Science Programme in Learning Design and Technology is a 4-year integrative programme jointly offered by the Faculties of Education, Engineering and Science. Its design is based on the latest re-formulation of the science of education in which education is cast as “a metadiscipline or discipline of disciplines” to equip learners with knowledge, competencies, and leadership to facilitate learning and development in and beyond the formal education settings. Graduates of the programme will be equipped with multi-disciplinary knowledge in education, technology, and science with education and learning sciences serving as the unifying threads. Not only will students be provided with internship opportunities to consolidate theory-practice integration, but they will also carry out research projects to synthesize multi-disciplinary knowledge and action-science competencies.

## Programme Features

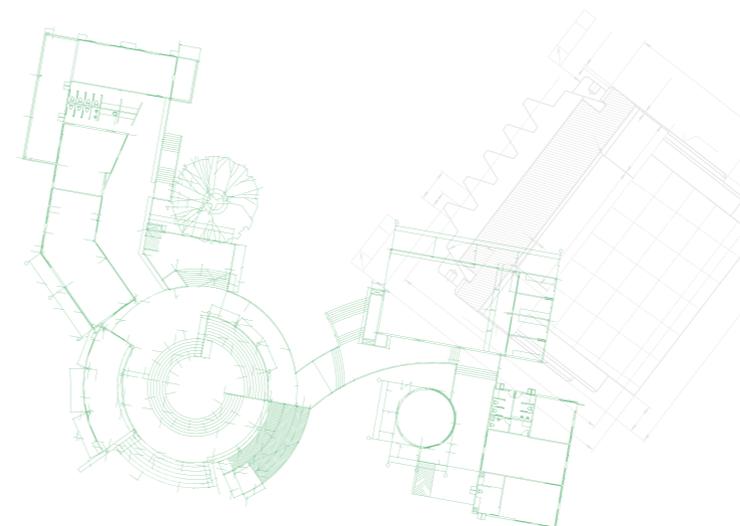
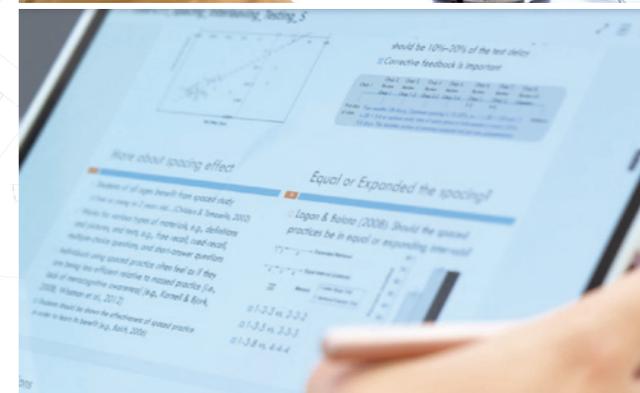
- Integrative, multi-disciplinary programme in education, technology and science
- Theory-driven, action-science oriented, and lab-based learning approach
- Integrated STEM education with technology-based and multi-media instruction in multicultural contexts
- Service learning competencies through education and community engagement
- Research in technology, science and transdisciplinary studies in and beyond STEM education
- Articulation with the teacher professional programmes in technology- and/or science-related teaching and other research-based postgraduate programmes in education and/or technology-related disciplines

## Career Prospects

Graduates can pursue professional careers in schools, school-sponsoring bodies, government sectors, non-governmental organizations (especially those specializing in solving social problems by means of education), education-related companies and industries in local, regional, and global settings including the Greater Bay Area. They are also equipped to serve in a variety of settings where there is an interface between education and STEM, including industries, businesses, schools, non-governmental organizations, and other new and emerging education-related industries. Additionally, graduates who want to pursue a teaching career can continue their study in the teacher professional programmes to obtain a technology- and/or science-related teaching qualification.

### LDTE-related careers:

- Learning designers / strategists
- Learning technology specialists
- Multimedia learning specialists
- Technology-supported learning environment designers
- STEM education designers
- Science / technology teachers
- Educational product developers
- E-learning consultants / trainers
- Technology managers / officers
- Educational data analysts
- Education officers / administrators / researchers



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Math is our passion and Engineering is our profession.

# JOINT PROGRAMME Mathematics and Information Engineering

## Introduction

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

## Programme Features

The programme places a strong emphasis on research and the students enjoy a variety of opportunities to take up research work during the summer. A significant proportion of graduates from this small programme have pursued graduate studies in the top schools worldwide, including MIT, Stanford, Berkeley, Caltech, etc.

## Career Prospects

The career prospects of graduates of this programme are very promising thanks to the unique combination of abstract mathematical thinking abilities and solid engineering know-how for tackling problems. Career opportunities are available in a diversity of fields including, but not limited to:

- Research – students pursue postgraduate studies in areas related to mathematics, information engineering, or computer science
- Information analysis – graduates work in analysing and processing information in quantifiable forms for the finance and banking industries
- Engineering – engineering careers related to networking, security, and system management are open to graduates in this field.

## YU Tingyang

2023 BSc (Mathematics and Information Engineering) graduate

Currently a PhD student in Communication and Computer Sciences at École Polytechnique Fédérale de Lausanne.

I joined the MIEG programme as I was attracted by its interdisciplinary nature. The comprehensive training from both Math and IE benefited me throughout my undergraduate study. For example, the advanced knowledge from probability theory intrigued me to apply random walk algorithm to solve practical problems and won the Best Project Award that year. With a stronger mathematical background, I independently learned many different areas and finally found my interest after this broad exploration.

MIEG also gives students a flexible atmosphere to take courses among IE, CS or Math departments



and encourages students to enroll in postgraduate courses which contain advanced and interesting topics. Consequently, my study plan is very personalized as I adapt it to my own interests.

Our programme also provides a supporting environment for students who want to have more intercultural experiences. I exchanged at the University of Toronto supported by IE Award for Academic Exchange. I also luckily received the overseas exchange opportunity and worked at the University of California, Davis supported by Professor Charles K. Kao Exchange Scholarship. These experiences enhanced my communication skills and equipped me as a collaborative person.

This programme is like magic for me: it gathers a group of students who are both passionate and curious, and there are so many professional and respectful professors who generously support students and kindly guide their journey. I sincerely hope that more students with passion and curiosity can join this programme!

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admin-mieg@ie.cuhk.edu.hk

<https://www.ie.cuhk.edu.hk/programmes/bsc-in-mieg>



# 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 in Integrated Business Administration (IBBA) upon completion of both programme requirements.

### 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 eventually do not join the second degree in Business Administration will be awarded a Minor in IBBA in recognition of the credit units earned from the IBBA courses if they have fulfilled the relevant academic requirements of the IBBA Minor programme.

[www.erg.cuhk.edu.hk/ergbba](http://www.erg.cuhk.edu.hk/ergbba)

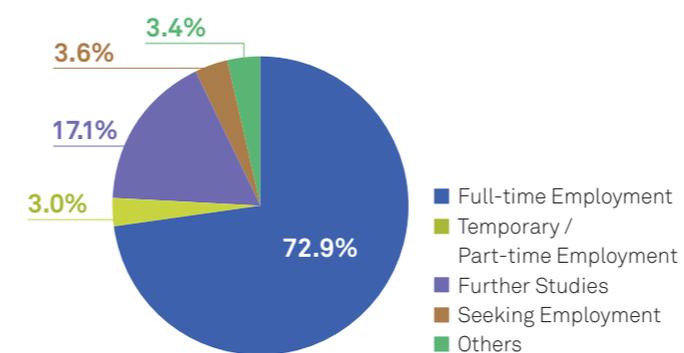


# Career Prospects

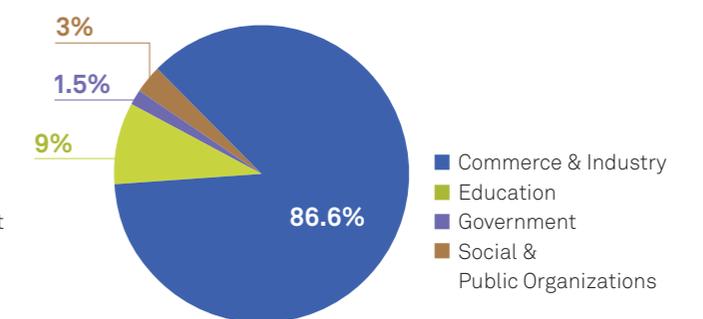
Graduates of the Faculty of Engineering of The Chinese University of Hong Kong have always been put on the top priority by employers. The multi-disciplinary and multi-talent training offered by the Faculty prepares its students best for a wide magnitude of career choices both in the business and government 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 2022

### (1) Employment Status



### (2) Sectors of Employing Organizations



## Career Fields

IT: Computer Hardware & Engineering	54.5%
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: Software Design & Development	
IT: System Solution & Services	
IT: Telecommunications	
Mechanical Engineering	9.5%
Teaching: Primary / Secondary / Tertiary / Teaching Assistant / Teaching: Others	5.5%
Banking / Finance / Middle Office / Business Consultant / Insurance / Wealth Management	4.9%
Administration / Management	4.4%
Scientific / Research Work	4.0%
Sales / Marketing	3.7%
Medical Devices & Instrumentation / Medical & Health Services	2.9%
Industrial Engineering & Product Design / Manufacture	1.8%
Statistical / Actuarial Work	1.8%
Environmental Services	1.5%
Logistics / Shipping	1.1%
Social Work / Community Work	1.1%
Others	1.1%
Art / Design	0.4%
Accounting / Auditing	0.4%
Customer Service	0.4%
Legal Services	0.4%
Hotel Management / Tourism / Catering Services	0.4%
Purchasing / Trading	0.4%

## 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 the Faculty of Engineering, CUHK.

# 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). To be admitted to CUHK, an applicant must first fulfill the university and programme-specific subject requirements. Please refer to the website of the Office of Admissions and Financial Aid (<https://admission.cuhk.edu.hk/jupas/requirements.html>) for further information.

## Non-JUPAS (Local) Admission

Local applicants holding other qualifications can apply through the non-JUPAS admission scheme. These qualifications include Associate Degree/Higher Diploma, 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 the Office of Admissions and Financial Aid for further information.

<https://admission.cuhk.edu.hk/non-jupas-yr-1/requirements.html>

## 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 the Office of Admissions and Financial Aid for further information.

<https://admission.cuhk.edu.hk/international/requirements.html>

## 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 23 units (normative period of study may be shortened by up to one year).

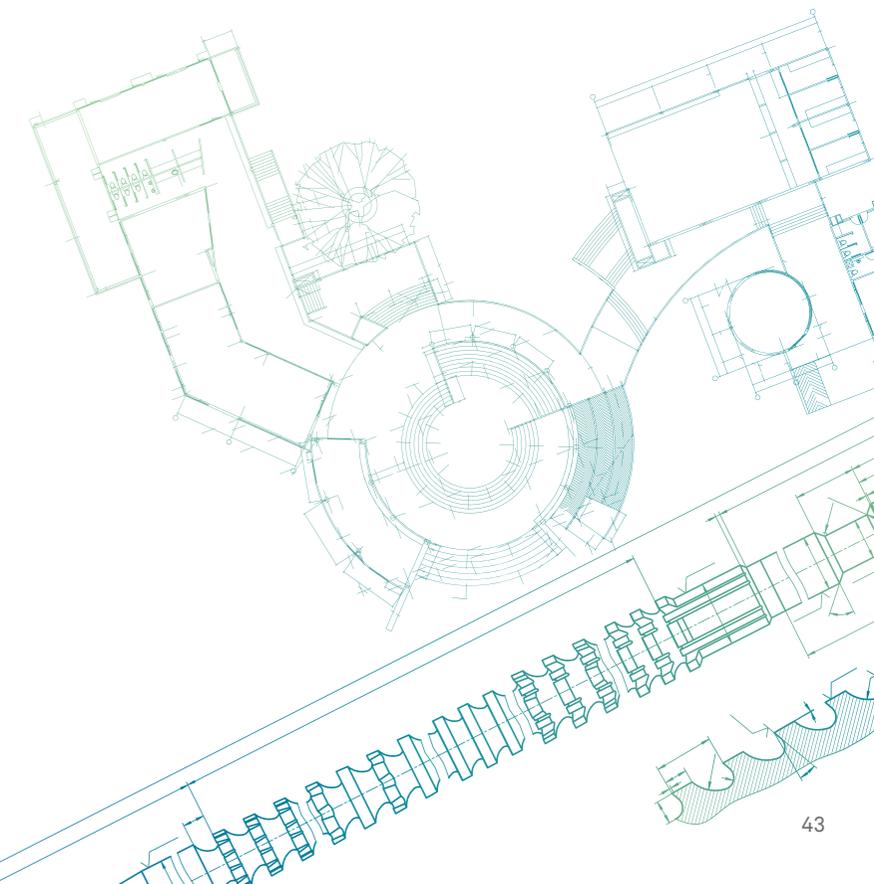


## Senior-Year Admission for Sub-degree Holders

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 2024-25 entry, nine engineering programmes offer senior-year places, namely, Biomedical Engineering, Computer Engineering, Computer Science, Electronic Engineering, Energy and Environmental Engineering, Financial Technology, Information Engineering, Mechanical and Automation Engineering, and 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 (<https://admission.cuhk.edu.hk/sc/mainland/requirements.html>) 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 2023-24 entry, about 50 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 the 2023-24 entry is listed for reference. Scholarship information of the 2024-25 entry will be announced through the Office of Admissions and Financial Aid) <a href="http://admission.cuhk.edu.hk">admission.cuhk.edu.hk</a>	
Achievements (Marks in any best 5 subjects)	Scholarships by the Faculty	Achievements	Scholarships by the University
35 marks	(i) Cash award of HK\$56,000 (renewable)	Level 5** in 7 or more subjects	(i) Full Tuition (renewable) (ii) Annual allowance of HK\$37,900 (renewable); and (iii) Up to a total of HK\$80,000 for one or multiple outgoing exchange programmes or overseas learning activities
33-34 marks	(i) Half Tuition (renewable); and (ii) Cash award of HK\$30,000 (renewable)	Level 5** in 6 subjects	(i) Full Tuition (renewable) (ii) Annual allowance of HK\$27,900 (renewable); and (iii) One-off amount of up to HK\$30,000 for an outgoing exchange or overseas learning activity
30-32 marks	(i) Half Tuition (one-off); and (ii) Cash award of HK\$30,000 (one-off)	Level 5** in 5 subjects	(i) Scholarship of HK\$30,000 (renewable); and (ii) One-off amount of HK\$10,000 for an outgoing exchange or overseas learning activity
		Level 5** in 4 subjects	(i) Scholarship of HK\$25,000 (one-off); and (ii) One-off amount of HK\$10,000 for an outgoing exchange or overseas learning activity
		Level 5** in 3 subjects	(i) Scholarship of HK\$12,000 (one-off); and (ii) One-off amount of HK\$10,000 for an outgoing exchange or overseas learning activity
		Level 5** in 2 subjects	(i) Scholarship of HK\$8,000 (one-off)
		Level 5** in 1 subject	(i) Scholarship of HK\$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 (for Admission Scholarship)

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

Remarks:

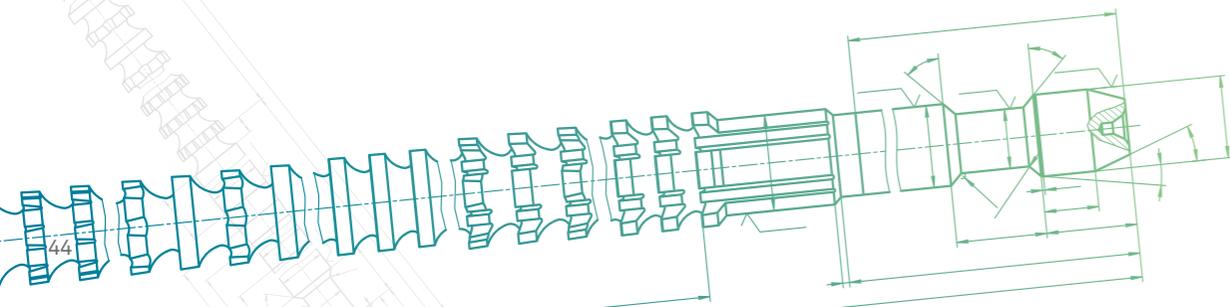
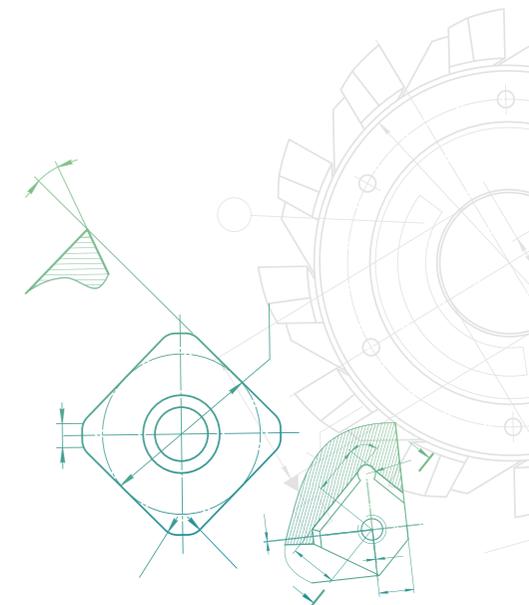
Mathematics Extended Module 1 or 2 is counted as one subject for scholarship considerations.

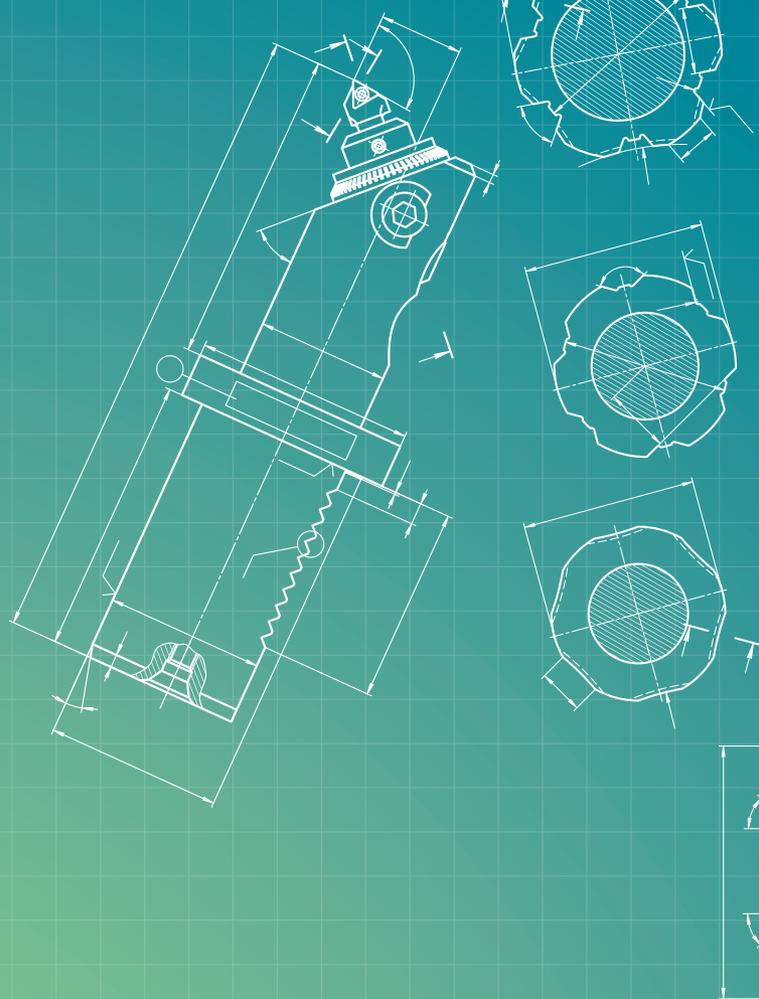
## For Non-JUPAS (Local) and International Students

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

HK\$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

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