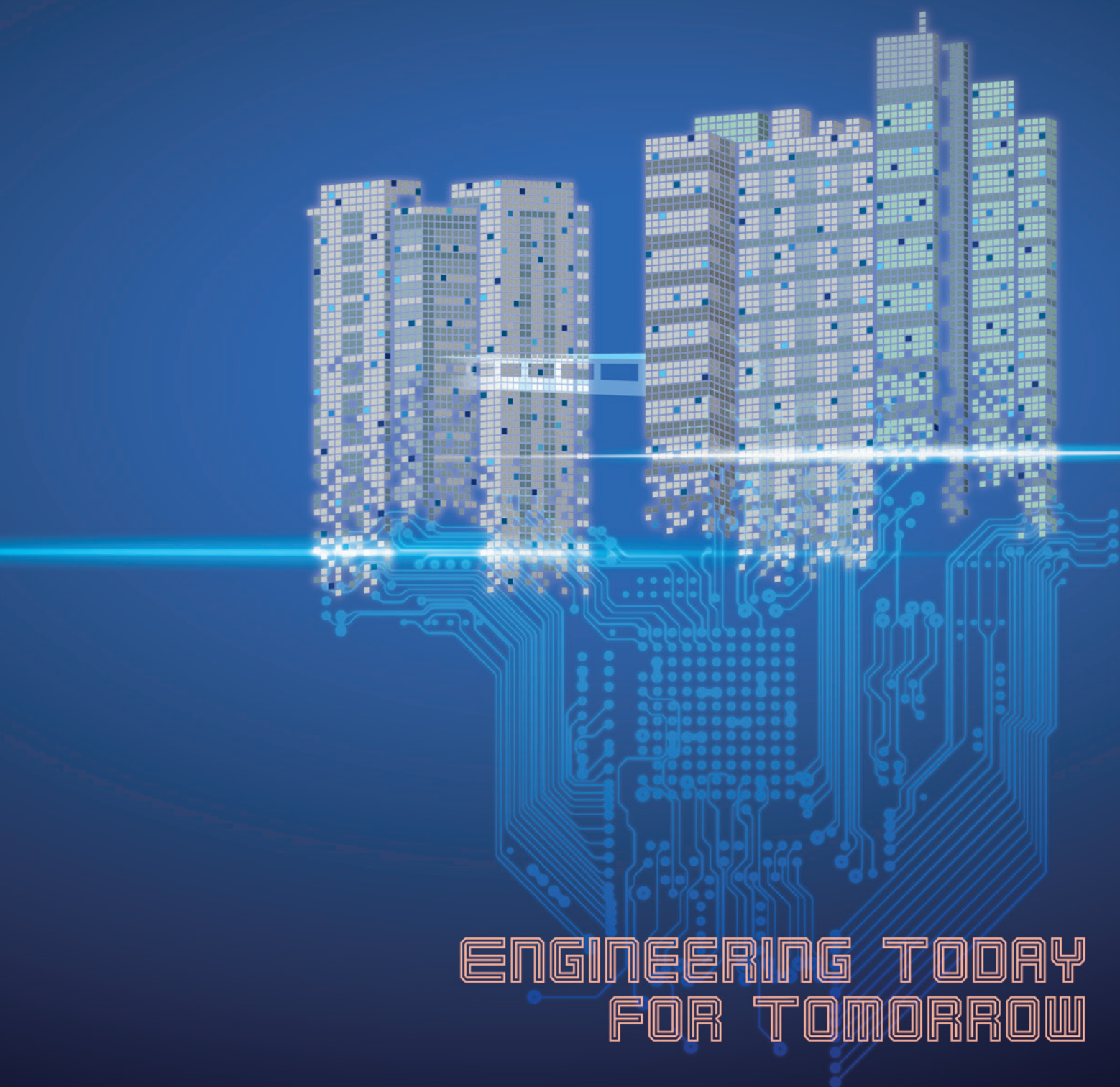
CUHK 2024-25

FACULTY OF ENGINEERING



ENGINEERING TODAY FOR TOMORROW

CUHK

Founded in 1963, The Chinese University of Hong Kong (CUHK) is a forward-looking comprehensive research university with a global vision and a mission to combine tradition with modernity, and to bring together China and the West. As a top university in Hong Kong and Asia, CUHK aims to nurture students with both specialized knowledge and wisdom for life. 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 a wide array of excellent undergraduate and postgraduate programmes.

CUHK undertakes a wide range of research programmes in many subject areas, and strives to provide scope for all academic staff to undertake consultancy and collaborative projects with industry. The University's insistence on the highest standards of research has won it an enviable research reputation. CUHK's high-quality basic and applied research in all disciplines underpins the first-class education it offers. The University has long promoted interdisciplinary research excellence on a local, national and international scale.

Contents

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 4000 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 is widely recognized 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 in the latest 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. That most of today's internet traffic in Hong Kong still goes through CUHK's routers is a testimony and legacy of our pioneering contributions on the internet in 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 HK 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 21st century is seeing even more technological changes than the 20th 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. Please contact us if you wish to learn more or wish to visit the facilities as a prospective student.

Prof. Hon Ki TSANG
Dean of Engineering

Faculty of Engineering

Faculty Mission

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

There are six departments in the Faculty of Engineering:

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

Degree Programmes

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

Bachelor of Engineering

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

Bachelor of Science

- Computer Science
- Aerospace Science and Earth Informatics & X Double Major Programme
- Computational Data Science
- Interdisciplinary Data Analytics & X Double Major Programme
- Learning Design and Technology
- Mathematics and Information Engineering

Double Degree Option

Engineering and Business Administration*

Postgraduate Diploma (full-time/ part-time)

Financial Technology

Master of Science (full-time/ part-time)

- Biomedical Engineering
- Computer Science
- E-Commerce and Logistics Technologies
- Electronic Engineering
- Financial Technology
- Information Engineering
- Mechanical and Automation Engineering
- Systems Engineering and Engineering Management

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

* 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.

Facts and Figures

Students (as of 5 July 2024)

2,541	Undergraduate
735	Taught Postgraduate
983	Master of Philosophy & Doctor of Philosophy

Staff (as of 5 July 2024)

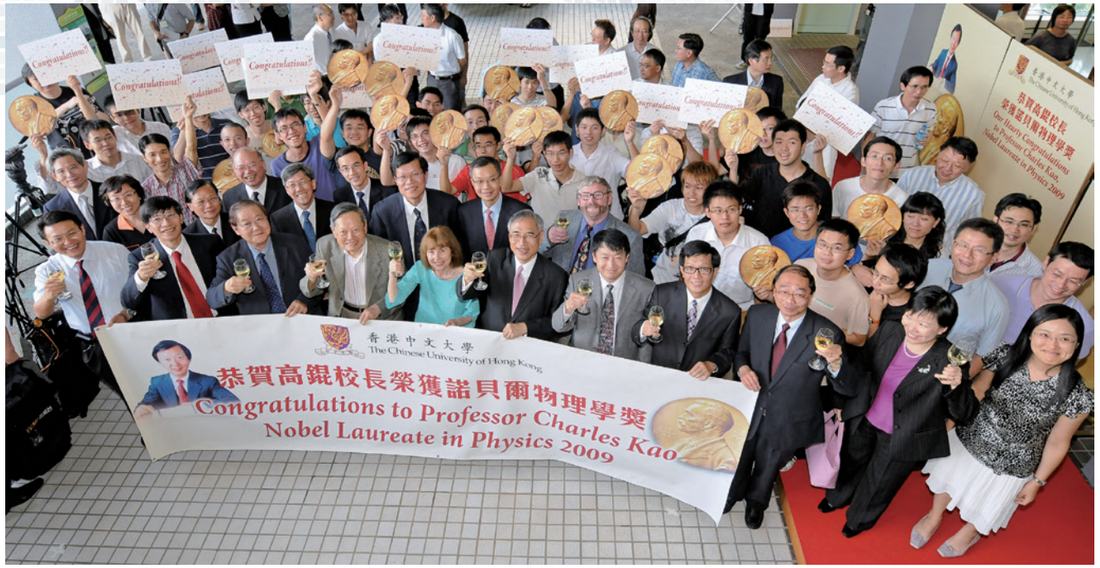
143	Professoriate
30.5	Non-Professoriate
314	Research support

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-class journals and conferences, and at the same time applied their R&D results into practical usage. Their efforts were well recognized by the public, and many of them were awarded different international prizes and honours.

Father of Fibre Optics

The 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.



CUHK InnoHK Centres

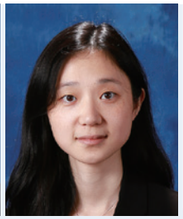
InnoHK is a major initiative of the Hong Kong Special Administrative Region Government to develop Hong Kong as the hub for global research collaboration. This involves the establishment of world-class research clusters at the Hong Kong Science Park with research laboratories set up by world renowned 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, one of InnoHK's two research clusters focusing on AI and robotics technologies:

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

RGC Senior Research Fellow / Research Fellow

Professor Michael Lyu Rung-tsong and Professor Zhao Ni received awards under the 2024-25 Research Grants Council (RGC) Senior Research Fellow Scheme (SRFS) in recognition of their distinguished research achievements. Professor Lyu received the award for his project "Evaluation, Exploration, and Application of Large Language Models on Code Intelligence" while Professor Zhao received the award for her research project on "Development of Optical Sensing Technologies for Early Detection and Ambulatory Monitoring of Cardiovascular and Cerebral Diseases". They will be given the title "RGC Senior Research Fellow" and receive a fellowship grant of about HK$8 million each to support for research projects over a period of 60 months.

Michael Lyu Rung Tsong



Zhao Ni

Yu Bei

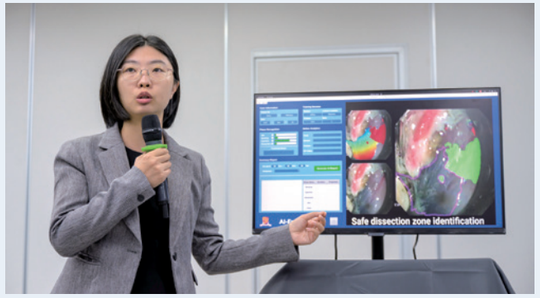
Professor Yu Bei received award under the 2024-25 RGC Research Fellow Scheme (RFS) for his project "Machine Learning Driven VLSI Mask Optimisation". He will be given the title "RGC Research Fellow" and receive a fellowship grant of about HK$5.3 million to support for research project over a period of 60 months.

Five Engineering projects receive funding from ITC's RAISe+ Scheme

Five project teams led by Faculty of Engineering Professors received funding support from the inaugural Research, Academic and Industry Sectors One-plus Scheme (RAISe+ Scheme) of The Innovation and Technology Commission (ITC) of the Hong Kong government. A signing ceremony was held on 28 May 2024. The projects cover a diverse range of innovative areas from advanced engineering, biomedical to biotechnology, demonstrating a high level of technology which enables the translation of research outcomes into product developments. Being granted funding for five projects, Faculty of Engineering received the highest number of awards among CUHK's universities in Hong Kong.

Prof. Tong Kai-yu Raymond, Professor and Founding Chairman of the Department of Biomedical Engineering, has been recognized as the recipient of the University Education Award 2023 (General Faculty Members). This is the highest recognition of excellence in education and teaching at CUHK, and it is only awarded to one recipient annually.

At CUHK BME, we believe in the power of education to transform lives. Our dedicated faculty members continuously strive to provide an enriching learning experience for our students, while also pushing the boundaries of teaching and research in the department.



Prof. Dou Qi helps to train a new Artificial intelligence (AI) platform to assist early-stage gastrointestinal cancer treatment, when CUHK Medicine has proved AI-assisted colonoscopy increases adenoma detection rate by 40%.

AI technology has rapidly been deployed in endoscopic diagnosis and treatment. According to Prof. Dou, to train AI-Endo, 47 complete ESD video clips consisting of over 2 million frames that span a long period of 12 years were compiled, which allowed it to learn the entire surgical workflow and dissect each real-time action. The AI interface is able to discern real-time procedures while the doctor performs ESD, guide the doctor through the whole process, and provide data for postoperative analysis and review. The result of this interdisciplinary research work has been published in the international journal Nature Communications.

Prof. Yu Bei receives the prestigious DAC Under-40 Innovator Award for contributions in Machine Learning Driven EDA. The award nomination highlighted Prof. Yu's pioneering contributions in the integration of machine learning with EDA, particularly in areas such as high-performance EDA algorithms, design space exploration, and optimization methodologies. His research has greatly advanced the efficiency and effectiveness of EDA tools, facilitating more robust and scalable design processes for semiconductor devices.

Prof. Yu's work has been instrumental in bridging the gap between theoretical research and practical applications, bringing innovative solutions to industry challenges. His efforts in developing machine learning algorithms for EDA have led to significant improvements in design quality and productivity, proving vital for the continued advancement of semiconductor technology.

Prof. Li Hongsheng has been awarded the Smart Traffic Fund (STF) with his project "AI for Generating High-definition Maps of Hong Kong from Ground-Aerial-Sky Multi-sensor Data" for a grant of HK$7.2million. The project aims to develop novel AI techniques for generating high-definition (HD) maps and semi-HD maps for Hong Kong from ground-aerial-sky multi-modal sensors with a view to providing accurate road attributes which are valuable for enhancing efficiency of road space and the safety of the assisted and automated driving vehicles.

Prof. Chen Shih-Chi was selected as a winner of the Falling Walls Breakthrough of the Year 2023 in the category of Engineering and Technology. Prof. Chen is recognized for his development of a revolutionary nanoscale 3D printing platform based on femtosecond projection that achieved a record-setting resolution of 20 nm, a printing rate of 400mm3/hour, and a lower cost at US$1.5/mm3. It supports nanofabrication with 20 different materials, addressing critical fabrication challenges in nanotechnology, photonics, energy, and biotechnology. The Year Award, initiated by the Berlin-based Falling Walls Foundation, showcases and celebrates the most recent breakthroughs in science and society from all around the world.

Prof. Liao Wei-Hsin won the 2023 Leonardo Da Vinci Award from the American Society of Mechanical Engineers (ASME). Prof. Liao is the first scholar from Hong Kong to win the ASME Leonardo Da Vinci Award in its 45-year history. The ASME commended Prof. Liao for his outstanding contributions to the design and invention of machines and devices for human motion assistance, with applications in prostheses, exoskeletons and wearables such as smartwatches and wristbands. The Award was established in 1978 to recognize eminent achievement in the design or invention of a product which is universally recognized as an important advance in machine design.

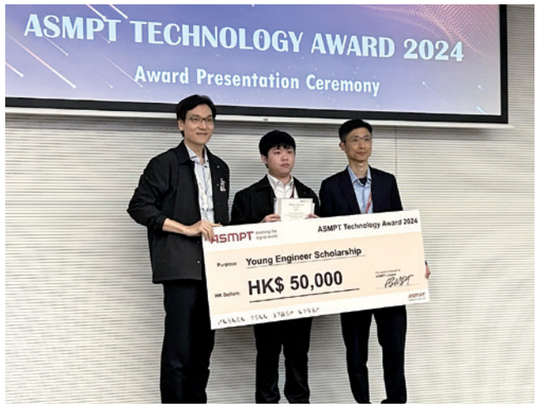
Prof. Xing Guoliang has been awarded HK$39.17 million for his five-year project, "Foundation Models-Empowered Ambient Intelligence Systems for Early Diagnosis, Personalized Intervention, and Complex Cross-Disease Interplay Analysis of Aging-Related Degenerative Diseases". The project proposes Koala, the first ambient intelligence system that leverages Foundation Models to provide non-invasive, personalized diagnosis, intervention, and cross-disease analysis for dementia and sarcopenia. It will involve 1,000 subjects from three Hong Kong hospitals, making it the largest cross-disease cohort study of its kind. The research aims to develop comprehensive health solutions and explore the relationship between sarcopenia and dementia, potentially improving diagnostic and therapeutic approaches for both conditions.

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.

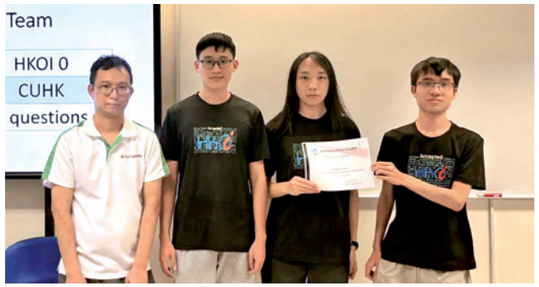
Student Achievements

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.



Lam Man Ho and Li Eric John, final-year Computer Science students from the Department of Computer Science and Engineering, won the Silver Award from the ASMPT Technology Competition 2024 with their project "On the Psychology of Large Language Models".

The ASMPT Technology Award promotes technological innovation in Hong Kong and recognizes students for their accomplishments in technology. The winning project, supervised by Prof. Michael R. LYU and advised by Mr. Jen-tse HUANG, demonstrates a comprehensive evaluation of Large Language Models, assessing their psychological and sociological aspects through various benchmarks, including personality traits, emotions, and decision-making in diverse environments.



Programming Team "HKOI 0", formed by three UG students from the Department of Computer Science and Engineering: Hsieh Chong Ho, Ng Hiu Tsun, Wai Ka Hei, won the ACM-HK Programming Contest and advanced to the ICPC (International Collegiate Programming Contest) World Finals.

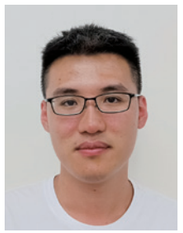
"HKOI 0" competed in various ICPC regional contests for several months, fighting for one of the 17 World Finals spots assigned to the Asia East Continent region, which consists of hundreds of teams from all the top universities in Mainland China, Hong Kong, and Macau. They are the only team who could solve all 7 challenging programming problems in the 4-hour contest for Hong Kong University programming teams, and the only team from Hong Kong which has qualified for the World Finals at Astana of Kazakhstan this year.

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.

Faculty of Engineering Robotics Team

The robotics team of the Faculty of Engineering received the Grand Prix Award at the ABU Robocon in 2024. It was the third 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, 2023 and 2024) of this international trophy, and in 2019 became the first Hong Kong team to win the championship.

CUHK robotics teams triumphed in 2024 contest again. The teams "Wonder Seed" and "Golden Farmer" won the Championship and the First Runner-up respectively in the Robocon HK Contest 2024. This is the 4th triumphs in four consecutive years for CUHK robotics team!



Mr. Lau Chin Wa Ken, a current PhD student in Information Engineering, has been awarded the 2024 IEEE Jack Keil Wolf ISIT Student Paper Award with his paper, "An Entropic Inequality in Finite Abelian Groups Analogous to the Unified Brascamp-Lieb and Entropy Power Inequality." The winning paper, co-authored with his supervisor, Prof. Chandra Nair, was presented at the 2024 IEEE International Symposium on Information Theory in Athens, Greece, in July 2024. Ken graduated from the BSc in Mathematics and Information Engineering programme in 2019-20.

The student research team comprising Mr. Chan Hoi Fung Ronaldo and Miss Xiao Can from the MAE Department won the International Sustainability Award in the James Dyson Award for their invention "E-COATING". This marks the first time a team from the Greater China region has won this international award. The Award encourages aspiring engineers to apply their knowledge and discover new ways to improve lives through technology.

E-COATING is a cooling coating embodies the principles of circular economy. It is made from recycled waste glass, manufactured at a lower cost, and capable of reducing the indoor temperature of buildings without using electricity.

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 2nd 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?".

The joint team of the MAE student group and Shenzhen Polytechnic University Team A Group received six awards in the Guangdong-Hong Kong-Macao Greater Bay Area Tertiary Institution Innovation Project GBA Invitational Competition organised by The Hong Kong Institution of Engineers in the Hong Kong Engineers Week 2024. The six awards include the Champion in Most Creative Remote Control Car Design Award, 1st Runner-up in Fastest Remote Control Car Award, 1st Runner-up in Most Eco-Friendly Bridge Design Award, 2nd Runner-up in Most Creative Bridge Design Award, 2nd Runner-up in Best Sandcastle Design Award and 2nd Runner-up in Best Teamwork Award.

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 course works and invaluable extra-curricular activities. The award of the ELITE Stream to qualified students will be officially recorded on academic transcript together with a certificate. A series of stimulating and inspiring courses will be offered exclusively for ELITE students. There are exclusive scholarships, special exchange opportunities, social and scholarly events specially organized for ELITE students.

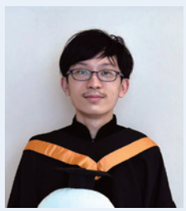
Details of the entrance, coursework requirements and declaration procedures for the Stream can be viewed at: www.erg.cuhk.edu.hk/elite

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 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 280 world-renowned 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.

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

NGUYEN Hoang Son

Artificial Intelligence: Systems and Technologies

Recipient of 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, 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

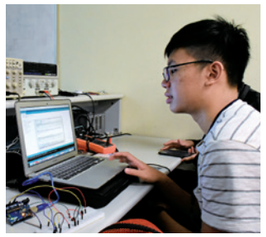
The programme collaborated with Peking University (PKU) supports engineering students to study both engineering and cultural courses in the College of Engineering, PKU.

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 nurture students to be educated persons capable of making informed judgment, serving the community and taking up the challenges of this ever-changing world.

Double Majors and Minor Programmes

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

Placement and Internship Progamme

To assist students in fostering their future career development, the Faculty has initiated the Placement and Internship Progamme (PIP) for decades. Many students take the option of a one-year full-time industrial 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 under supervision of 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 participating in the PIP

- ASMPT 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 Hong Kong and Shanghai Banking Corporation Limited
- The Hongkong Electric Co. Limited
- 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 and Automation Engineering (JS4408)
- Systems Engineering and Engineering Management (JS4458)

Interdisciplinary Programmes

- Aerospace Science and Earth Informatics & X Double Major Programme (JS4750)
- Computational Data Science (JS4416)
- Learning Design and Technology (JS4386)
- Mathematics and Information Engineering (JS4733)
- Interdisciplinary Data Analytics & X Double Major Programme (JS4760)

Artificial Intelligence: Systems and Technologies

‘Predicting the future isn’t magic, it’s artificial intelligence.’

– Dave Waters

Introduction

Artificial Intelligence (AI) is an emerging engineering discipline that focuses on technological innovations that enable 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.

Programme Features

The 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

As there is now a shortage of AI specialists both locally and globally, with the support of a pool of top-tier AI talent and sophisticated scientific research facilities, our programme aims to train talented AI engineers and scientists for the following industries: biomedical engineering/science, information and computing technologies, manufacturing and robotics, and intelligent multimedia processing for Internet companies.

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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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 programme is offered by the Faculty of Engineering in extensive collaboration with 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.

LIU Zhaoyu

2023 BEng (Biomedical Engineering) graduate

Currently pursuing his Master's degree at Johns Hopkins University

Embarking on my journey in Biomedical Engineering at CUHK, I have been fortunate to work with exceptional and supportive professors such as Prof. Duan, Prof. Gao, and Prof. Tong. The BME department's emphasis on interdisciplinary collaboration has also allowed me to work with Prof. Urs from the psychology department, broadening my perspective and enriching my learning experience. The department's introduction course was instrumental in helping me navigate the diverse fields within BME. Through engaging with different professors' research areas, I discovered my passion for combining engineering principles with medical applications. The summer research opportunities further solidified my interest, as I explored my own topics and focused on areas that excited me, pushing the boundaries of my knowledge and creativity.

With this strong foundation from CUHK, I recently graduated and had the incredible opportunity to pursue a master's degree at Johns Hopkins University (JHU) for BME, thanks to the great support and guidance I received from CUHK BME department. In this new environment, I am able to explore different research topics and learn advanced experimental techniques that I am interested in, and also participate in exciting projects with different people around the world. However, looking back from now, I realized that I am able to explore effortlessly actually stems from my experience of actively exploring, which is a priceless gift I received from CUHK BME.

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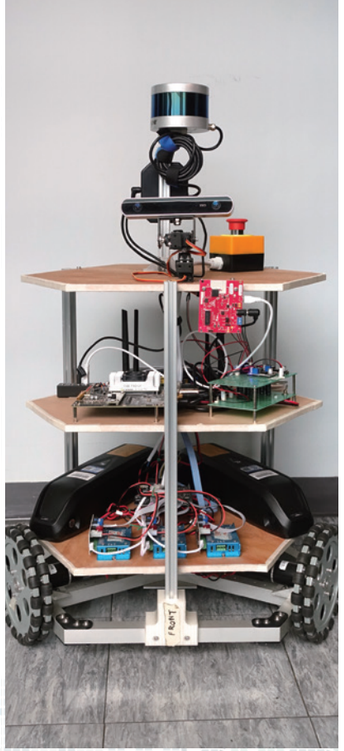
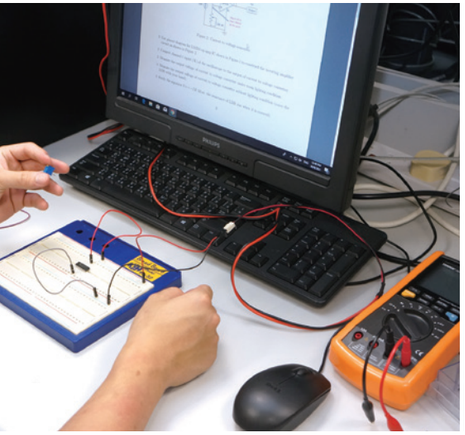




Computer Science and Engineering

Introduction

Starting from 2022-23, students can now be directly admitted to the Department of Computer Science and Engineering through the “department-based” programme Computer Science and Engineering (BCSE). Upon completing the first year of studies, BCSE 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 of their choice of major.

Programme Features

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. It is accredited by the Hong Kong Institution of Engineers (HKIE). 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;
- System connectivity: Computer network; etc.

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.

Career Prospects

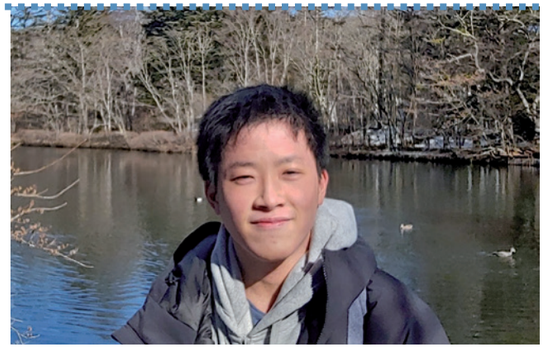
Over the years, the Department of Computer Science and Engineering has built up a large alumni network in the computer industry of Hong Kong. Many of our graduates have taken up important positions in various organizations and companies, such as the HKSAR Government, The Hongkong and Shanghai Banking 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

YUEN Lok Kan Ethen

2024 BSc (Computer Science) graduate,
Software Engineer, Nex Team Inc.



Studying Computer Science at CUHK has been an incredible journey filled with challenges. Most of my time at CUHK was spent on the CUHK ICPC Programming Team, operated under the CSE Department. Throughout the years, we spent hours every day discussing algorithms and practicing our skills through contests. Thanks to the Department’s support, we could travel and compete with world-class Asian programmers. I’m proud of our team’s achievements, including winning Gold Awards at multiple regionals and the continental final. It shows that Hong Kong can nurture talents whose abilities are on par with the best in the world.

What I liked about the Computer Science curriculum is the emphasis on theoretical knowledge, taught through courses like Data Structures, Formal Languages and Automata Theory, and Principles of Programming Languages. The importance of these courses is often overlooked by many people as they seem too abstract and impractical. However, they have been fundamental in building my understanding of how computers work. I think that is what differentiates studying Computer Science from solely trying to land a job as a Software Engineer.

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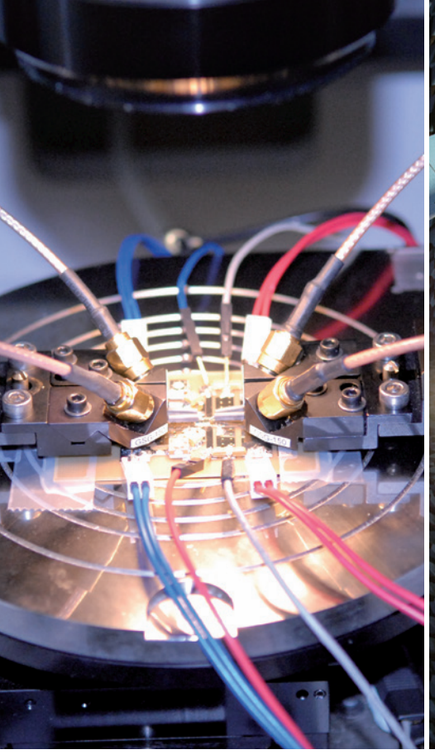
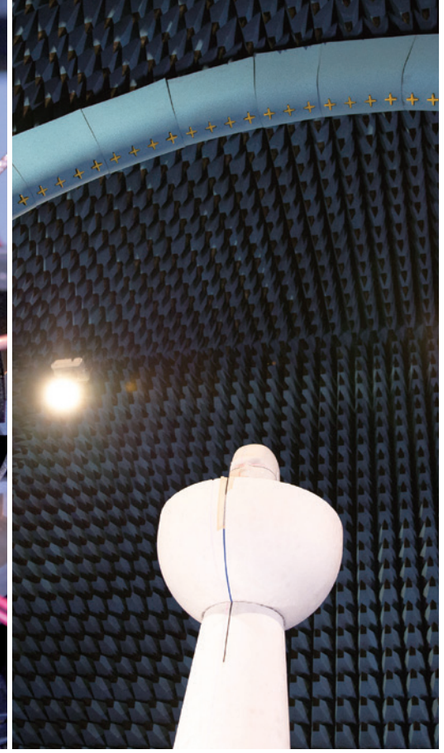
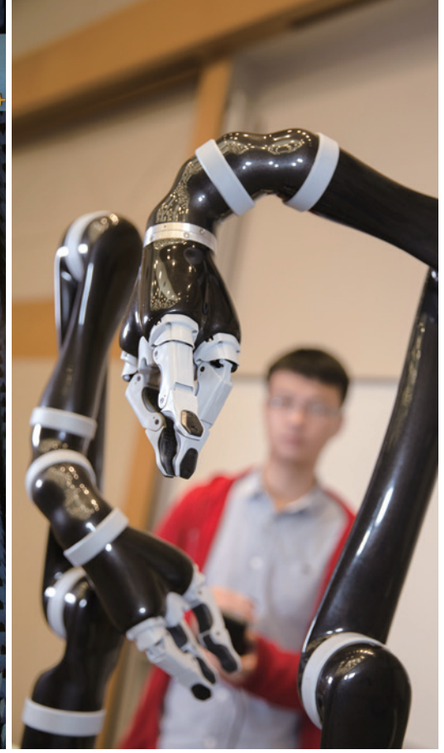
CENG: https://www.cse.cuhk.edu.hk/admission/cengn/
CSCI: https://www.cse.cuhk.edu.hk/admission/cscin/

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 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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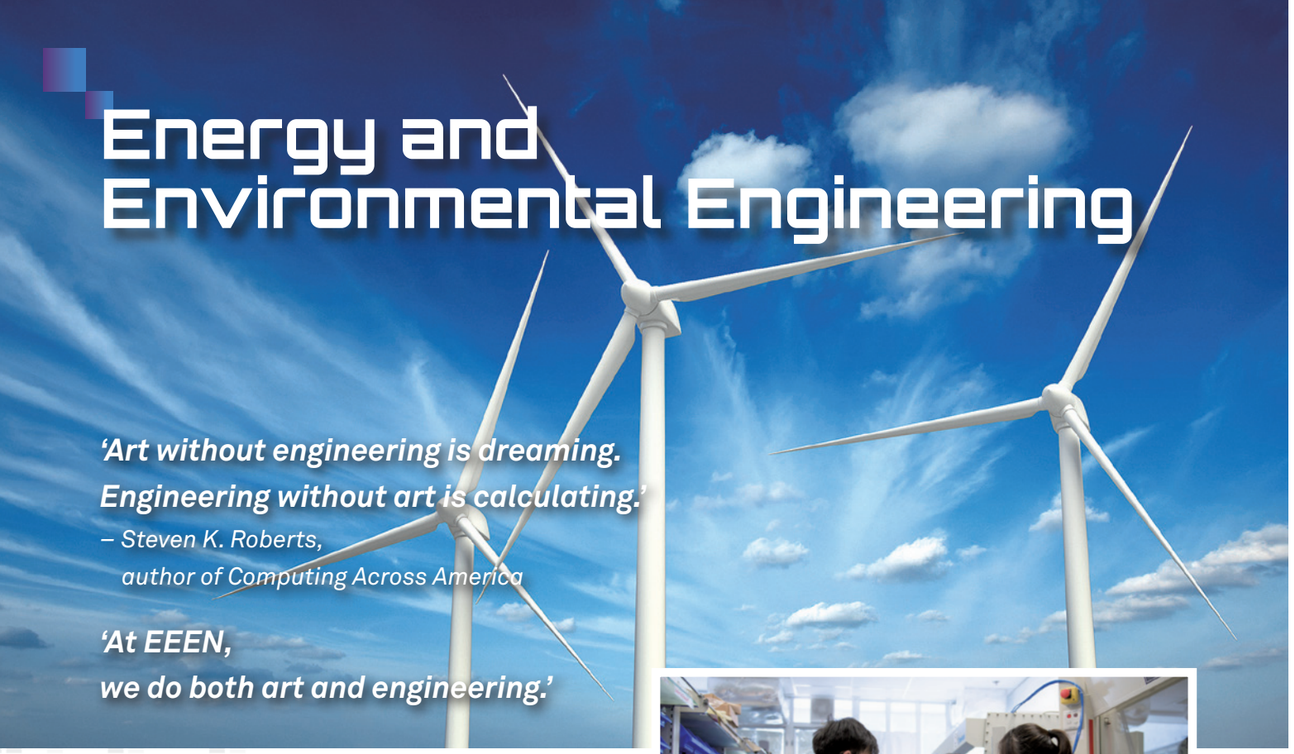
Energy and Environmental Engineering



'Art without engineering is dreaming. Engineering without art is calculating.'
– Steven K. Roberts,
author of Computing Across America

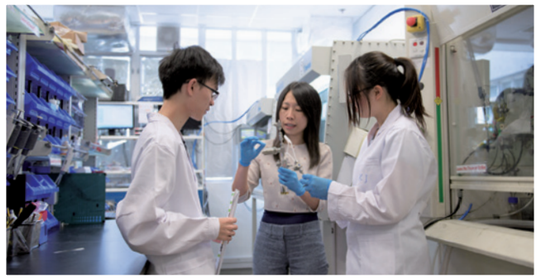
'At EEEN, we do both art and engineering.'

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.

SIN Tsun Ting, Edwin

2023 BEng (Energy and Environmental Engineering) graduate

Environmental Engineering Graduate,
Environmental Protection Department,
The Government of the HKSAR

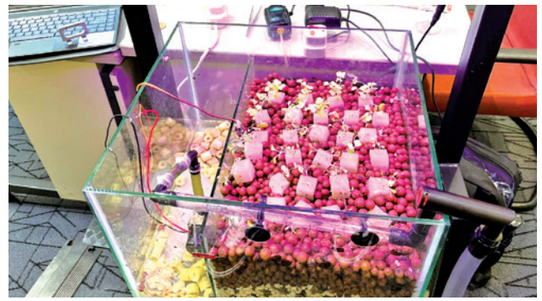
The EEEN programme offers a wide variety of courses from different faculties and departments across CUHK, presenting an ideal environment for nurturing multidisciplinary engineering talents. The wide-ranging course offerings allow me to build extensive technical knowledge in areas such as thermofluids, power systems, hydrology, air pollution, and environmental impact assessment. This equips me with the comprehensive engineering skills needed to thrive in the workplace and prepares me for a career as an energy and environmental engineer. I would like to express my sincere gratitude to all the professors, lecturers, and tutors I met at CUHK for their dedicated teaching and unwavering support throughout my university journey.

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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'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, a dual-degree programme in Finance and FinTech with Shanghai Jiao Tong University, as well as a dual-degree programme in Financial Math and FinTech with Peking University.

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.

IP Wing Yan

2023 BEng (Financial Technology) graduate

Technology Associate, Morgan Stanley

My major is Financial Technology, which is under the department of SEEM. The programme covered a broad variety of topics, from financial mathematics to information systems. It offered me ample exposure in both finance and technology, as well as the combination of these two subjects, that is, applying the latest technology in the financial world. The training in this programme has also strengthened my analytic skills and attention to details. These knowledge and skills helped me secure a job in one of the top-tier investment banks in the world, Morgan Stanley. My current role is a technology associate under the Institutional Securities Technology Department, where I am responsible for developing and optimizing the Fixed Income Risk Calculation System in the firm.

If I had a second chance, I would still choose this programme to study in my university life. It has taught me a lot and paved my professional career path.

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Information Engineering

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

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: Systems and Applications, 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.

CHEN Tingzhu, Arya

2024 BEng (Information Engineering) graduate

Master student, Imperial College London

My four years at CUHK were a transformative journey of growth. I chose Information Engineering in my second year due to its diverse curriculum and broad field coverage. What impressed me most were the lab courses, where theory and practice seamlessly merged, deepening my understanding and application of knowledge. These labs honed my problem-solving skills, critical thinking, and attention to detail — skills that have been invaluable in my continued studies and work.

I am deeply grateful for the professional and friendly professors in the IERG programme. Their engaging courses and patient guidance beyond the classroom encouraged me to embrace challenges and continue my academic journey. The vibrant campus life, coupled with the supportive community, made my experience even more enriching. CUHK Engineering provided me with the most precious and unforgettable educational experience of my life, equipping me for every leap forward in my future endeavours.

I will always cherish the memories and lessons learned during my time at CUHK.

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

- Design and Manufacturing
- Mechatronics
- Robotics and Automation

Courses in business, technical communications, engineering ethics, design application and final year projects are included in the programme to enhance students' training as future professional. 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, 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 ambitious and land 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 San Wai Sewage Treatment Works and 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 study in Master of Data Science with a fellowship presented by the University Grants Committee.

LEE Ka Ki, Karen

2023 BEng (Mechanical and Automation Engineering) graduate

Graduate Engineer, Airport Authority Hong Kong

The MAEG programme provides a comprehensive curriculum that integrates mechanical engineering with automation technologies. This approach encourages an interdisciplinary mindset, training me to combine knowledge and skills from diverse fields such as electronics, computer science, and materials science.

A key strength of the programme is the emphasis on hands-on projects and industry training. These practical learning experiences have enhanced my problem-solving abilities and equipped me with the skills needed to tackle real-world engineering challenges.

The programme has prepared me for a graduate job at the Airport Authority. My previous learning on control systems, programmable logic controllers, sensors, and actuators has boosted my understanding of the design, installation, and maintenance of the mission-critical automated systems in the airport.

This blend of theoretical knowledge and practical application has built a solid foundation for my career in engineering.

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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.

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YAN Pui Hang

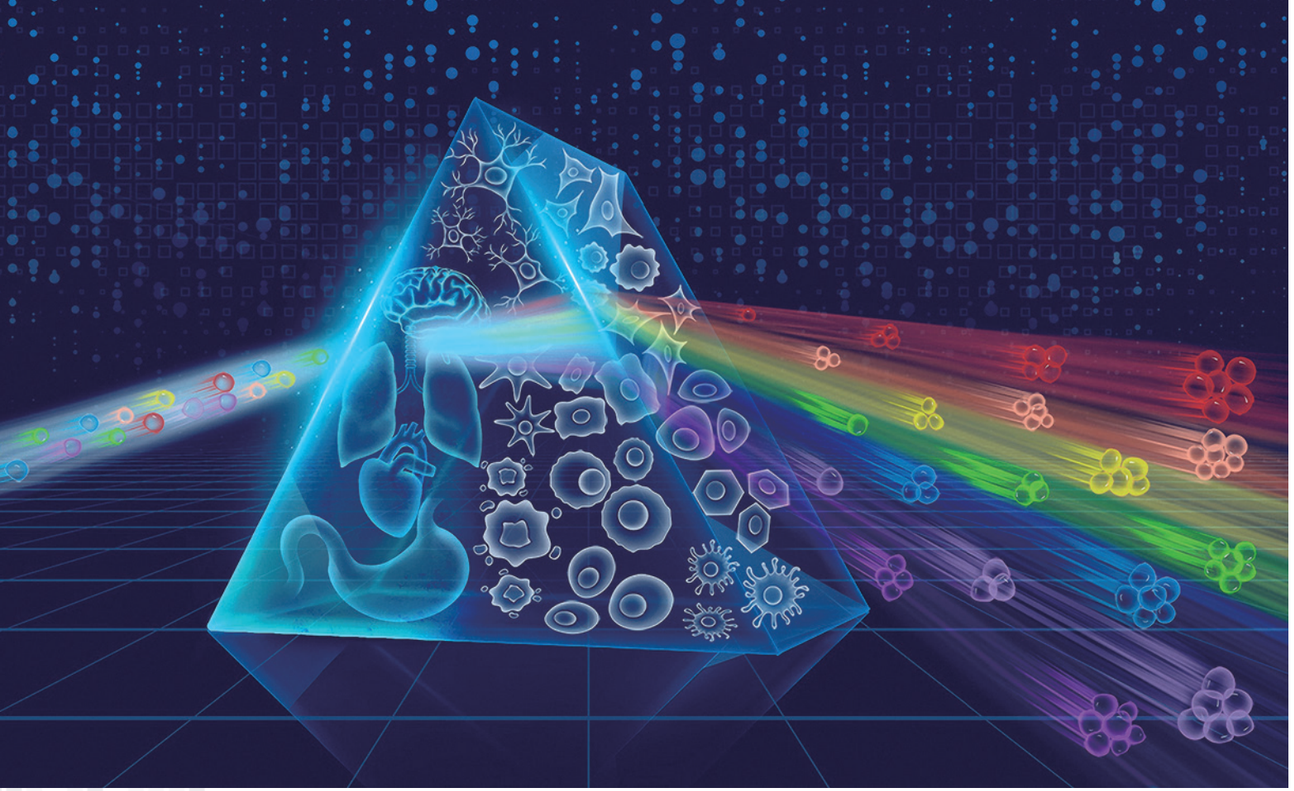
2024 BEng (Systems Engineering and Engineering Management) graduate

Currently preparing to study for a master's degree in Japan

If you want to study an engineering program but do not want to be limited to one or two fields, then SEEM is absolutely suitable for you. Here, you will not only learn algorithms and programming languages, but also gain in-depth understanding of system engineering principles and practices from multiple perspectives, including system design, data processing, development, operation, and management. In the real world, talents who are good at management and possess engineering skills are in short supply. At this point, practical knowledge of system engineering and engineering management will come in handy.

In addition, not only does the program offer a wide range of industries to work in after graduation, but the training provided by the SEEM program also offers more choices for my future studies compared to other engineering programs, such as business management, computer science, and data science.

I hope you can choose the subject you like and have a wonderful university life!



JOINT PROGRAMME

Computational Data Science

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

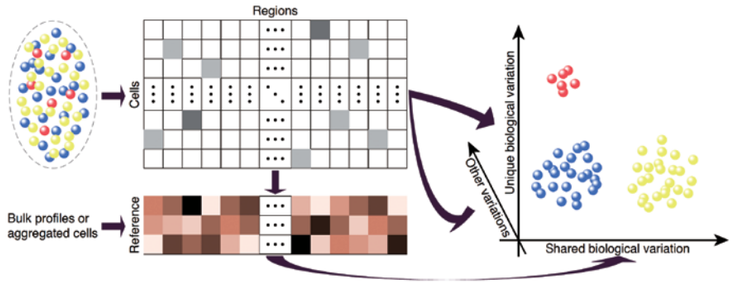
Introduction

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.

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;
- 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;
(d) Computational Social Science

CDAS	
Faculty Package	Programming Linear Algebra Advanced Calculus
Major Foundation	Discrete Mathematics Data Structure Probability Statistics Python R, SAS C++
Required courses	Algorithms & Computer Systems Artificial Intelligence Operating Systems Machine Learning / Data Mining / Statistical Learning Survey Methods / Statistical Computing / Bayesian Learning Statistical Inference / Applied Regression Analysis Nonparametric Statistics / Categorical Data Analysis
Research	Final Year Project
Practicum	
Stream elective courses	Computational Data Science Computational Physics Computational Medicine Computational Social Science Engineering Leadership, Innovation, Technology and Entrepreneurship (ELITE) Stream (Faculty of Engineering)

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 that 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.

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.

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https://www.cdas.cuhk.edu.hk

JOINT PROGRAMME

Learning Design and Technology

Introduction

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

MAZAYA Naura Olif

Learning Design and Technology Student

Studying a multi-disciplinary programme gives me wide and different perspectives from the perspectives of education, science, and technology. I can be taught by professors from various expertise (such as research, academia, and technology) and collaborated with classmates from different backgrounds to gather ideas from different perspectives about how education technology is such a powerful tool for today's world and the future's world. I am most excited because of the wide range of courses that the LDTE programme offers align with my passion and interest. I am ready for many more exciting learning experiences to come during my study years on this vibrant campus!

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www.fed.cuhk.edu.hk/ldte/

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. Many 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.

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https://www.ie.cuhk.edu.hk/mieg

SHIU Chun Hei, Michael

2024 BSc (Mathematics and Information Engineering) graduate

PhD student, The University of British Columbia

Engineering is the study of modeling and finding solutions to problems around us, and mathematics is the key to helping with solve the problems. The Mathematics and Information Engineering Programme allows me to understand engineering challenges from a mathematical perspective, and explore the applications of mathematics. Taking courses offered by different departments provided me with complementary training in abstract thinking and concrete implementations, which is crucial in academic research.

The best aspect of MIEG is the small cohort, which feels like a family. Like-minded students can collaborate on academic work while supporting each other at the same time. Additionally, MIEG provides numerous opportunities for academic research and industry internships, allowing students with different career plans to pursue their dream.

Double Degree Option

Engineering and Business Administration Double Degree Option

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

Programme Structure

Eligible students could pursue their first bachelor degree at the Faculty of Engineering with a selected major (BMEG, CENG, CSCI, ELEG, EEEN, FTEC, IERG, MAEG or SEEM), and after completing the first degree, pursue the second bachelor degree at the Faculty of Business Administration for one year. Students would be awarded a Bachelor of Engineering and a Bachelor of Business Administration (BBA) in Integrated Business Administration (IBBA) upon completion of both 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 Integrated Business Administration will be awarded a Minor in Integrated Business Administration in recognition of the credit units earned from the IBBA courses if they have fulfilled the relevant academic requirements of the IBBA Minor programme.

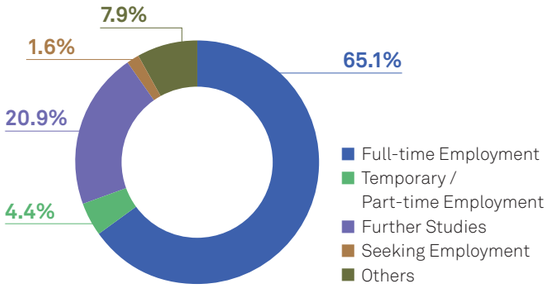
www.erg.cuhk.edu.hk/ergbba

Career Prospects

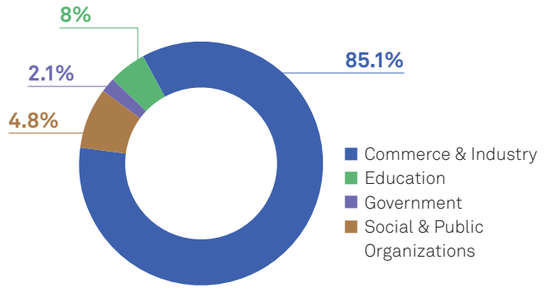
Graduates of the Faculty of Engineering of The Chinese University of Hong Kong have always been put on the top priority by employers. The multi-disciplinary and multi-talent training offered by the Faculty prepares its students best for a wide magnitude of career choices both in the business and government 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 2023

(1) Employment Status



(2) Sectors of Employing Organizations



Career Fields

IT: Computer Hardware & Engineering IT: Data Communications & Network / Internet Engineering IT: eBusiness IT: Electronic Engineering IT: Engineering Consultancy IT: Financial & Quantitative Analysis / Engineering IT: Information Systems Administration & Management IT: Multimedia & Digital Entertainment IT: Software Design & Development IT: System Solution & Services IT: Telecommunications	54.6%
Banking / Finance / Middle Office / Business Consultant/ Insurance / Wealth Management	8.6%
Teaching: Primary / Secondary / Tertiary/ Teaching Assistant / Teaching: Others	6.2%
Mechanical Engineering	4.5%
Others	4.5%
Administration / Management	4.2%
Scientific / Research Work	3.5%
Medical Devices & Instrumentation / Medical & Health Services	3.1%
Architecture / Surveying / Construction	2.1%
Industrial Engineering & Product Design / Manufacture	1.7%
Environmental Services	1.4%
Customer Service	1.4%
Logistics / Shipping	1.0%
Art / Design	0.7%
Sales / Marketing	0.7%
Accounting / Auditing	0.3%
Publication / Editorial	0.3%
Hotel Management / Tourism / Catering Services	0.3%
Purchasing / Trading	0.3%
Public Relations / Mass Communication	0.3%

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 queueing systems and prevent website crash due to high online traffic. The system allows operators to control traffic peaks of a website that may expect hundreds of thousands of visitors for high-demand sales events, flash sales and/or quota allocations.

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

Admissions

JUPAS Admission

Secondary school students taking the Hong Kong Diploma of Secondary Education (HKDSE) Examination should apply for admission through the Joint University Programmes Admissions System (JUPAS). 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/application/jupas/admission/) 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, HKALE, GCE-AL, IAL, IB, SAT/AP and other overseas qualifications for university admission. Applications will be assessed on a case-by-case basis. Please refer to the website of the Office of Admissions and Financial Aid for further information.

https://admission.cuhk.edu.hk/application/non-jupas/overview/

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/application/overseas-other-qualifications-non-local-international-team/requirements/

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 2025-26 entry, nine engineering programmes offer senior year places. They are namely, Biomedical Engineering, Computer Engineering, Computer Science, Electronic Engineering, Energy and Environmental Engineering, Financial Technology, Information Engineering, Mechanical and Automation Engineering, Systems Engineering and Engineering Management.

Admission through National Colleges and Universities Enrolment System

Mainland students, who are current Gao Kao candidates, are welcome to apply through the National Colleges and Universities Enrolment System. Applicants may refer to the website of Recruitment section of Mainland China Students (https://admission.cuhk.edu.hk/sc/application/mainland-gaokao/overview/) 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 2024-25 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 2024-25 entry is listed for reference. Scholarship information of 2025-26 entry will be announced through the Office of Admissions and Financial Aid) admission.cuhk.edu.hk	
Achievements (Marks in any best 5 subjects in a single sitting)	Scholarships by the Faculty	Achievements	Scholarships by the University
35 marks	(i) Cash award of $56,000 (renewable)	Level 5** in 7 or more subjects	(i) Full Tuition (renewable) (ii) One-off Study Allowance and Exchange Scholarship of HK$410,000 for local and/ or overseas learning activities
		Level 5** in 6 subjects	(i) Full Tuition (renewable) (ii) One-off Study Allowance and Exchange Scholarship of HK$310,000 for local and/ or overseas learning activities
33-34 marks	(i) Half Tuition (renewable); AND (ii) Cash award of $30,000 (renewable)	Level 5** in 5 subjects	(i) Full Tuition (renewable) (ii) One-off Study Allowance of HK$170,000 for local and/ or overseas learning activities (iii) One-off amount of HK$30,000 for an outgoing exchange or overseas learning activity
		Level 5** in 4 subjects	(i) Full Tuition (renewable) (ii) One-off amount of HK$10,000 for an outgoing exchange or overseas learning activity
30-32 marks	(i) Half Tuition (one-off); AND (ii) Cash award of $30,000 (one-off)	Level 5** in 3 subjects	(i) Scholarship of HK$42,100 (one-off) (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$12,000 (one-off) (ii) One-off amount of HK$10,000 for an outgoing exchange or overseas learning activity
		Level 5** in 1 subject	(i) Scholarship of HK$8,000 (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 Faculty 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

$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.

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