香港中文大學
The Chinese University of Hong Kong

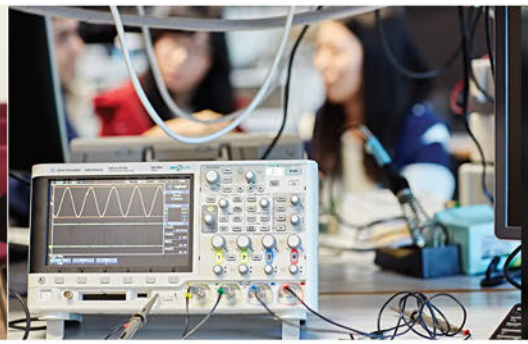
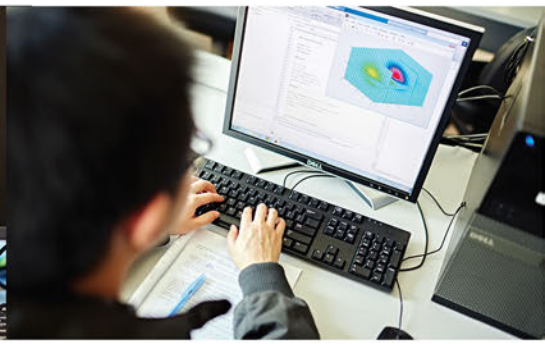
信息工程
Information Engineering

Discover IE,
Discover Your Future!

INFORMATION ENGINEERING

Principles, Technologies, Networks, and Applications

- Internet Architecture & Protocols
- Internet of Things
- Computer Vision & Deep Learning
- Multimedia Processing
- Cyber Security
- Applied Cryptography
- Information & Software Engineering
- Network Software Design & Programming
- Smartgrids, Green Communications
- Data Science & Machine Learning
- Big Data Systems & Applications
- Online Social Networks
- Network Economics
- Optical Networks
- Wireless Communication Systems
- Information Theory & Network Coding

Information

Data, Voice, Image, Video, Multimedia

- Transmission
- Networking
- Processing

Engineering

- **Understand the principles** (fundamental)
- **Solve problems** (scientific and systematic)
- **Create new technologies** (innovative)

To train engineering leaders who can manage and create new information technologies for all disciplines.

PROGRAMME

Programme Features

The mission of the Information Engineering Department is to nurture and educate engineering leaders of the Information World of today and tomorrow. We offer an all-round engineering education that focuses on:

- Sound engineering knowledge and creativity;
- Solid experience with innovative technologies;
- Good soft skills (communication, interpersonal, and business);
- Broad vision and exposure.

The Information Engineering Programme is accredited by the Hong Kong Institute of Engineers (HKIE).

Streams of Specialization

Students may choose to develop their engineering specialities in one or more of the following streams:

Big Data -	Web-scale Information Analytics, Programming Big Data Systems, Internet of Things, Social Media and Human Information Interaction, Cloud Computing, Machine Learning, Reinforcement Learning....
Internet Engineering -	Advanced Networking Protocols and Systems, Network Economics, Network Software Design and Programming, Mobile/Web Applications, Mobile Networking, Building Scalable Internet Services, ...
Cyber Security -	Intro to Cyber Security, Applied Cryptography, Web Security & Programming, Secure Software Engineering, Digital Forensics, Security and Privacy in Cyber Systems, Advanced Topics in Blockchain....
Communications -	Digital Communications, Signal Processing, Optical Communications, Wireless Communications, Telecommunication Switching and Network Systems, Emerging Technologies in Information Engineering....
Enrichment -	Multimedia Coding and Processing, Stochastic Processes, Channel Coding and Modulation, Simulation and Statistical Analysis, Information Theory, Network Coding, Design & Analysis of Algorithms, ...

Internship, Work Study, Overseas Exchange

Students can acquire work experience by taking short-term or 7-15 month long paid internship in reputable companies in Hong Kong, or gain international exposure by going for a short term or year long overseas exchange. We offer overseas exchange scholarships to students with good academic results.

Pre-final year students can also participate in a Work Study Program on a voluntary basis. Each participant is required to spend about a year in a selected local company as a full-time employee and continue his/her final year of study after the internship.

Participating companies include HSBC, PCCW, SmartTone Telecommunications Ltd., MTR Corporation Ltd., CLP Power Hong Kong Ltd., Hewlett-Packard (HP), Fujitsu PC Asia, IBM China/Hong Kong Ltd., Lenovo Group Ltd., Morgan Stanley, JP Morgan Chase, Thomson Reuters, The Hong Kong Jockey Club, Octopus Cards Ltd., Hong Kong Monetary Authority, and Office of the Government Chief Information Officer, etc.

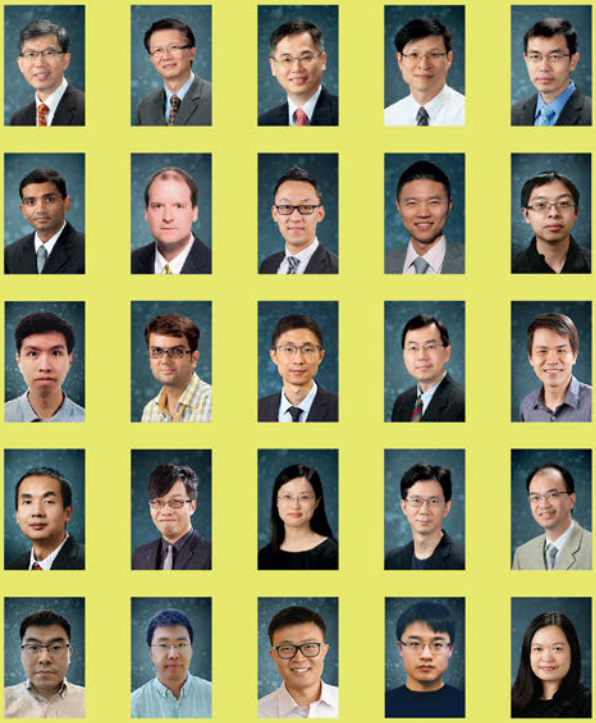
Further Studies

The Information Engineering Department undertakes world-leading research and offers top quality Ph.D., M.Phil., M.Sc., and B.Eng programmes. Our graduates have been awarded full scholarships to enter Ph.D. programmes of top universities all over the world (e.g., MIT, UC Berkeley, Stanford, Caltech, UCLA, CMU, UIUC, Oxford and Cambridge, etc.)

Double-Degree Options

In collaboration with the Faculty of Business Administration, the Information Engineering Department is also offering the Double-Degree Programme in Information Engineering and Business Administration. Please refer to http://www.erg.cuhk.edu.hk/erg/ergbba for detailed information about the double-degree option.

PROFESSORS



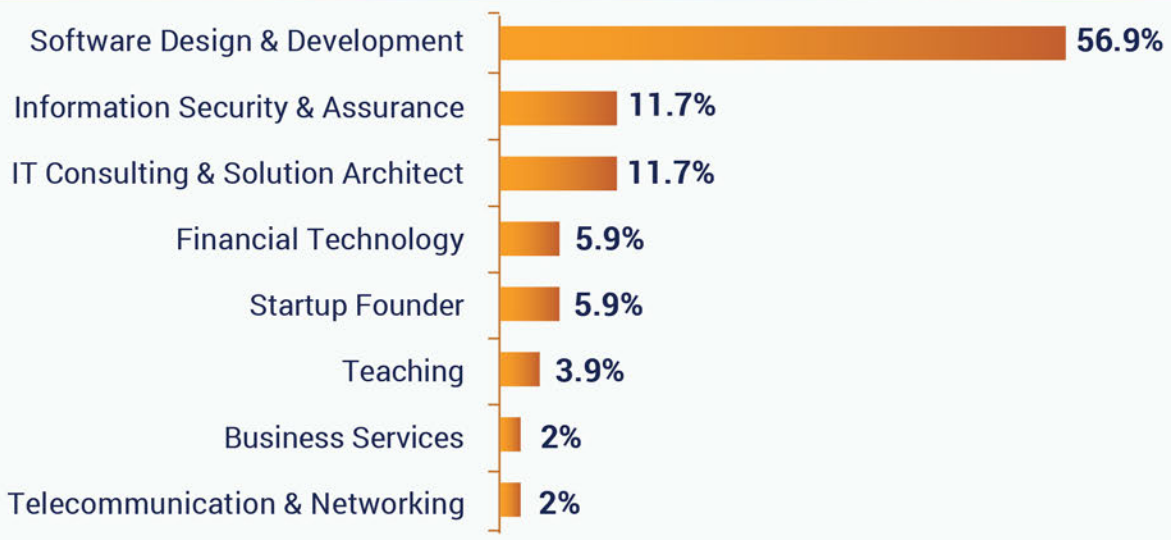
Our Professors are dedicated educators and world-class researchers who obtained their Ph.D. degrees from top universities like MIT, Stanford, Caltech, Columbia, Cornell, ETH Zurich, as well as CUHK. Many of them have extensive industrial experience with leading institutions world-wide before joining the department. They are authors of seminal and award-winning publications, holding key patents for innovations in various fields. They maintain strong ties with the local industries and actively contribute to the international research communities. Most importantly, our professors love to interact with students and inspire them to become top-notch researchers, engineers, and leaders.

NGINEERING

EMPLOYMENT STATISTICS

With solid IT knowledge, strong problem solving skills, and good communication abilities, our graduates have very promising careers. We have about 100 graduates every year that go for a diversified set of careers. Most of them start as engineering professionals, while others go to business or other disciplines. More than 10% of our fresh graduates continue for full-time studies.

2019 IE Graduate Employment Survey in March, 2020
Job Nature of Graduates



GRADUATE SHARING

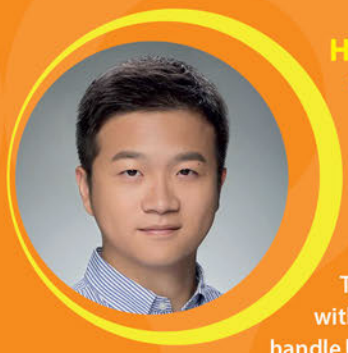
WONG Pak Hei

2019 IERG Graduate; currently an MPhil student in Information Engineering, CUHK

The CUHK IE programme offers opportunities and resources to students to get in touch with some state-of-the-art technologies that are being used to solve problems in real life. Through conducting challenging laboratory works and projects, I have developed practical and theoretical skills which have enabled me to further explore many areas. I am grateful to have had an opportunity to work on a research-oriented FYP. In my FYP, I have developed a framework for conducting deep learning tasks by collecting training data from multiple parties without disclosing the privacy of the data. These experiences have given me not only relevant knowledge and skills, but have also trained me how to persuade someone to trust that my framework is feasible to resolve problems thanks to pertinent research results.

HUANG Cen

2018 IERG Graduate; currently an MPhil student in Statistics and Data Science, Yale University



It has always been a hard choice for undergraduate students to choose their major area of study even after the one-year freshman experience. This is especially the case for those students who keep inquisitive and explorative minds towards software, hardware, and all kinds of engineering problems. Fortunately, by combining CS and EE knowledge, Information Engineering (IERG) helped me to build a solid foundation not only in mathematics and programming, but also in hardware.

Thanks to taking mathematics courses on topics like calculus, linear algebra, and probability theory, along with acquiring a good command of programming tools, data structures, and algorithms, I have been able to handle larger quantities of data in a more efficient and practical manner. The IE curriculum has also prepared me well for a deeper dive into a wide range areas like coding theory, communication systems, and deep learning, which has allowed me to do research in various scientific areas. For instance, thanks to an industrial collaboration arrangement for my FYP, I have completed a 3-month-long internship at SenseTime Group Ltd., where I have applied deep neural networks (DNN) in computer vision problems. At the same time, I have also cooperated with PhD students from different departments and exchanged ideas actively, which has also boosted my interest in doing postgraduate studies overseas. As a Master's student in Statistics and Data Science at Yale University, I am looking forward to further broadening my knowledge and contributing to society.

TANG Sum Yee

2019 MIEG Graduate; currently a Technology Analyst at J.P. Morgan

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

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

YUAN Jiyao

2018 MIEG Graduate; currently a Master student in Electrical Engineering, Stanford University

The MIEG programme emphasizes a combination of mathematical theories and engineering projects. It has provided me with a rich choice of courses in different fields, including mathematics, electrical engineering, and computer science.

The most memorable experience for me has been some summer research that I have conducted at Stanford thanks to a Professor Charles K. Kao Research Exchange Scholarship from the CUHK Faculty of Engineering. This ten-week-long research experience has helped me to deeply understand the topic that I investigated. I have also learnt a lot from other people on how to approach difficult research problems. Besides significant academic gains, I have also obtained a precious opportunity to experience a different culture, which has expanded my horizon.

If you are still unsure on whether you should join this programme, I would say that if you really want to learn as many things as possible and meet high-quality friends, go for it! Be prepared to handle different challenges that you will face during the next several years. Wish you a fruitful academic journey!

CURRICULUM

Major Requirement including Faculty Package (75 units)		Wide Range of Elective Courses
Year 1	*Faculty Package:* Problem Solving by Programming Linear Algebra for Engineers Multivariable Calculus for Engineers + Calculus for Engineers *and one more foundation course* FUNDAMENTAL	Big Data: Web-scale Information Analytics Programming Big Data Systems · Internet of Things Social Media & Human Info Interaction Image & Video Processing Machine Learning · Cloud Computing
Year 2	Discrete Mathematics for Engineers, Principles of Communications Systems, Communications Lab Data Structures, Signals & Systems, Engineering Practicum Basic Analog & Digital Circuits, Probability Models and Applications Introduction to Systems Programming Electronic Circuit Design Laboratory ADVANCED	Internet Engineering: Advanced Networking Protocols and Systems Network Software Design & Programming Mobile Networking · Mobile/Web Applications Building Scalable Internet Services Network Economics
		Cyber Security: Intro to Cyber Security · Applied Cryptography Web Security & Programming · Digital Forensics Secure Software Engineering · Blockchain Security & Privacy in Cyber Systems
Year 3	Microcontrollers and Embedded Systems, Computer Networks Information & Software Engineering Practice, Information Infrastructure Design Lab *plus major electives* PROFESSIONAL	Communications: Digital Communications · Signal Processing Optical Communications · Wireless Communications Telecommunication Switching & Network Systems Lightwave System Technologies
Year 4	Final Year Project I and Final Year Project II *plus major electives* SPECIALIZED	Enrichment: Multimedia Coding & Processing Stochastic Processes · Channel Coding & Modulation Simulation and Statistical Analysis Information Theory · Network Coding Theory Design & Analytics of Algorithms

Plus University Core Requirement, including English Language, Chinese Language, General Education, Physical Education & IT Training.

CAREER PROSPECT

Stage 3	Leadership	Chief Technology Officer · Chief Executive Officer · Entrepreneur	
Stage 2	Managerial	Technology Expert · Project Manager · Business Consultant	Business Education Marketing Government Management Others
Stage 1	Professional	Project Engineers - hardware, software, networking System Engineers - systems, security, services Data Engineers / Scientists, Business Intelligence Product Management, Sales / Marketing Engineers Research / Training / Consulting	
		Engineering Positions	*Non-Engineering Positions*

CONTACT US

Please refer to the brochure of the Faculty of Engineering or visit the website at http://www.erg.cuhk.edu.hk for admission details.

香港中文大學信息工程學系
Department of Information Engineering, The Chinese University of Hong Kong

Phone: (852) 3943-8385
Fax: (852) 2603-5032
Email: dept@ie.cuhk.edu.hk
Website: http://www.ie.cuhk.edu.hk

Version: 2020.09