



THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department of Electronic & Computer Engineering

電子及計算機工程學系



This is HKUST

- Opened in 1991
- HKUST is an international research university
- Leading the advance of science and technology
- Educating the new generation of front-runners for Asia and the world
- 5 Schools & 19 Departments
 - Science, Engineering, Business & Management, Humanities & Social Science, FYT Graduate School
 - 13,741 Students (9,113 UGs; 4,628 PGs)
 - 531 Academic Faculty
- School of Engineering
 - 6 Departments, 167 Regular faculty
 - 5,301 Students (3,259 UGs; 2,042 PGs)



International Recognition

- **ECE Ranked 19th by QS world ranking by subject for 2015**
 - ECE ranked No. 1 in Greater China by QS world ranking by subject for 2014, 2013 and 2012
- **HKUST was ranked 4th by Times Higher Education in The 100 under 50 universities from 2012-2015**
- **Kellogg-HKUST EMBA Program No. 1, Global EMBA Rankings (2009-2013)**
- **HKUST was ranked No.1 in Asia by QS Asia University rankings in 2013, 2012 and 2011**

The Department of **Electronic & Computer Engineering**

- **MISSION**

- To strive for excellence, progress and innovation in research and teaching
- To nurture and inspire students who change the world
- To address global challenges and regional opportunities

- **GOAL**

- To be the leading engineering department in Hong Kong, the region and the World

World-class Faculty Members

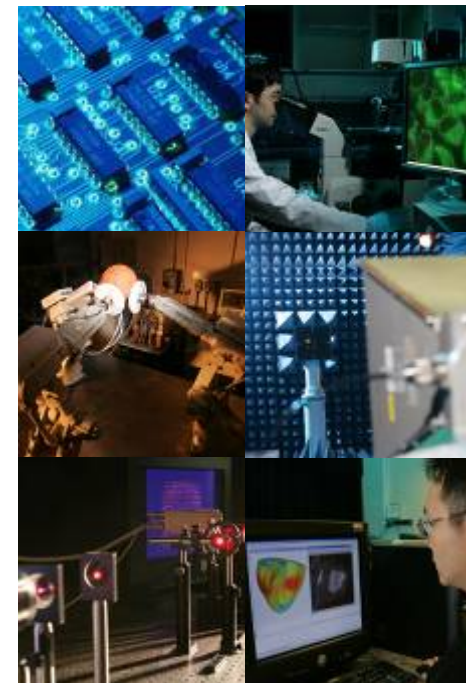
- A talented group of ~40 regular faculty members with PhDs from world-renowned universities and over 80 support staff
- 20 IEEE Fellows - one of the most outside North America
 - About 50% of dept
- Extremely active in research and research publication
 - Over 300 journal and 400 conference papers per year
- Over 300 US patents allowed or in progress
- 45 Editors of major research journals
- Very active in startup companies (over 30 startups)

Faculty in ECE

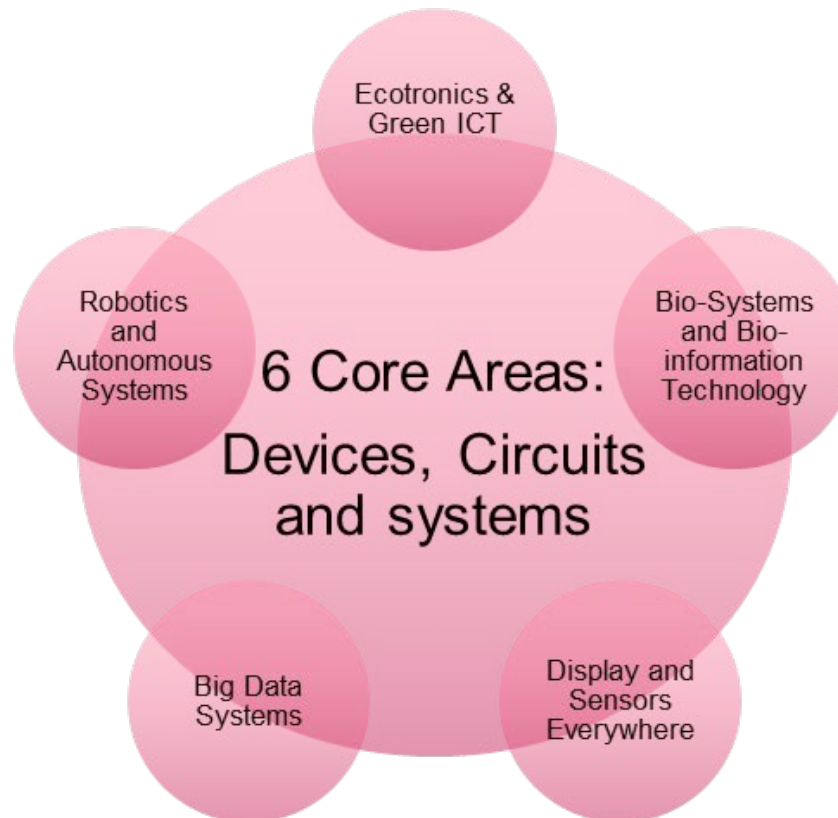


Research Core Areas

- ECE encompasses 6 synergetic sub-areas
 - **Solid-State Electronics and Photonics (S2EP):**
 - (Hoi Kwok, Kei May Lau, Kevin Chen, Mansun Chan, Zhiyong Fan, Johnny Sin, Man Wong, Andrew Poon, Ching Tang -9)
 - **Integrated Circuits and Systems (ICS):**
 - (Howard Luong, Philip Mok, Amine Bermak, Ki, Jiang Xu, Wei Zhang, CY Tsui, Patrick Yue, Volkan Kursun, George Yuan- 10)
 - **Wireless Communications and Networking (WCN):**
 - (Vincent Lau, Khaled Ben Letaief, Ross Murch, Roger Cheng, Danny Tsang, Wai-Ho Mow, Chin-Tau Lea, James She-8)
 - **Biomedical Engineering (BME):**
 - (Bert Shi, Weichuan Yu, Levent Yobas, Jianan Qu-4)
 - **Control and Robotic Systems (CRS):**
 - (Zexiang Li, Li Qiu, Ling Shi, Shaojie Shen-4)
 - **Signal, Information and Multimedia Processing (SIMP):**
 - (Matthew Mckay, Pascale Fung, Bing Zeng, Daniel Palomar -4)



Interdisciplinary research themes



- Make impact to challenging problems in society

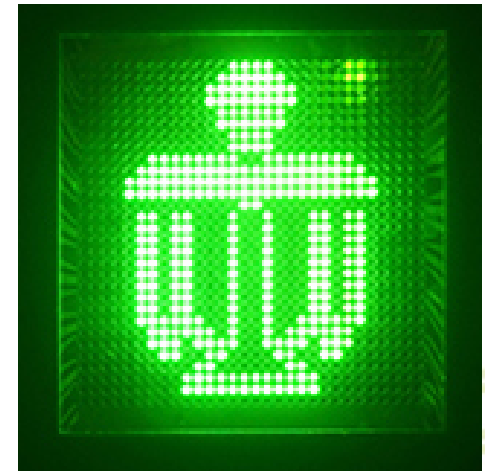
Robotics and Autonomous Systems (RAS)

- Systems that operate with high degree of autonomy are desirable in many fields such as space exploration, automated industries, unmanned vehicles and UAVs. Within the theme of Robotics and Autonomous Systems (RAS), ECE will play a major role in the future by conducting leading edge research in system integration, sensing, control and decision making in autonomously operating control systems.
- Faculty: Z. Li (coordinator), A. Bermak, L. Qiu, J. She, S. Shen, B. Shi, L. Shi. T. Woo, Jiang Xu, George Yuan



Displays and Sensors Everywhere

- In terms of functionality, sensors continue to improve significantly. Future smart devices will incorporate new sensor types, such as biometric, pressure, and environmental sensors. With increased portability comes the need for more power-efficient and flexible displays. Power-efficient, flexible, and foldable display technology will soon reach “retina resolution”. Within the theme of Display and Sensors Everywhere (DSE) both of these areas will be combined into a coherent approach to human interface hardware
- Faculty: Hoi Sing Kwok (coordinator), Amine Bermak (coordinator), Mansun Chan, Vladimir Chigrinov, Ross Murch, James She, Man Wong, George Yuan



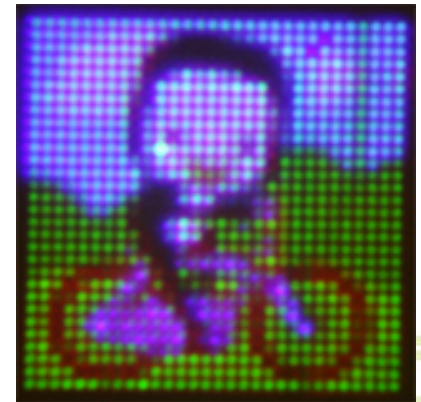
Big Data Systems (BDS)

- Analysis of huge amounts of audio, spoken, text, visual and location data, modeling of user intentions and sentiments, modeling of user relations and interactions, as well as predictive analytics for recommendation engines; statistical modeling and robust inference in the area of financial engineering, biomedical informatics.
- Big Data hardware provides physical platforms and infrastructure for effectively gathering, processing, storing, sharing and utilizing complex large data set anytime anywhere.
- The BDS theme is more than just analytics, but a comprehensive approach involving data acquisition, high performance computing and analytics involving key applications.
- Faculty: Pascale Fung (coordinator), Jiang Xu (coordinator), Roger Cheng, Volkan Kursun, Chin-Tau Lea, Mathew McKay, Wai Ho Mow, Ross Murch, Daniel Palomar, Andrew Poon, James She, Danny Tsang, Albert Wong, Patrick Yue, Wei Zhang



Ecotronics and Green ICT (EGI)

- A key part to the state of the environment is the production of energy. Ecotronics and Green ICT (EGI) – Solid State Energy Systems will be a major contributor in the form of solar energy, efficient lighting and power management all relying on a strong nano-electronic program.
- Faculty: Kei May Lau (coordinator), Philip Mok (coordinator), Kevin Chen, Zhiyong Fan, Wing-hung Ki, Volkan Kursun, Hoi Sing Kwok, CY Tsui, Man Wong, Jiang Xu, George Yuan, Patrick Yue, Wei Zhang

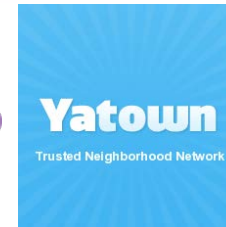


Bio-Systems and Bio-information Technologies

- Bio-systems and Bio-information Technology (BBT) will play a key role in health and biology by leveraging technologies developed in nano-electronics for drug delivery, monitoring, imaging and processing.
- Faculty: Mathew McKay (coordinator), Amine Bermak, Mansun Chan, Wing-hung Ki, Andrew Poon, Jianan Qu, Bert Shi, Levent Yobas, Weichuan Yu, George Yuan, Wei Zhang



ECE: A Vibrant Entrepreneurship Culture



World-class Students

- **Over 280 top notch PhD students that find positions in leading academic and industry positions world wide**
 - approx 40 graduate per year
- **Over 230 Masters students that find excellent industrial positions**
 - **50 MPhil (2 year research degree)**
 - approx 25 graduate per year
 - **180 MSc (1 year taught degree)**
 - approx 180 graduate per year
- **Over 550 undergraduate students in our BEng Electronic Engineering and BEng Computer Engineering**
 - Innovative and fun curriculum
 - approx 230 graduate per year

Academic Excellence- Very High Quality

- Ranked 1st in the world in the number of papers published in *IEEE Transactions on Wireless Communications* from 2002 to 2012 (TWC)
(HKUST, UBC, Waterloo, Alberta, Georgia Tech, National Chiao-Tung, Nanyang Tech, Texas, Minnesota, Stanford)
- Ranked 2nd in the world in the number of papers published in *IEEE Transactions on Electron Devices* from 1998 to 2012 (TED)
(National Chiao Tung, HKUST, Stanford, Purdue, National Tech U, MIT, Seoul National U, MIT, National U Singapore, Georgia Tech)
- Ranked 6th in the world in the number of papers published in *IEEE Transactions on Circuits and Systems for Video Technology* from 1997 to 2012 (TCSVT)
(National Tech U, National Taiwan, National Chiao-Tung, KAIST, Chinese U, HKUST, Washington, USC, City U, National Cheng Kung)
- Ranked 14th in the world in the number of papers published in *IEEE Journal of Solid-State Circuits* from 1996 to 2012 (JSSC)
(UCLA, Stanford, MIT, UC Berkeley, National Taiwan, KAIST, National Chiao-Tung, U of Toronto, Delft U Tech, Katholieke, UCSD, Texas A&M U, Oregon State U, HKUST)

Creating Influential PhD Graduates

- **Academia**

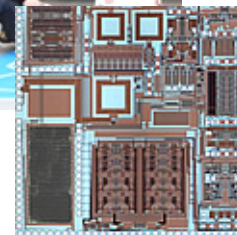
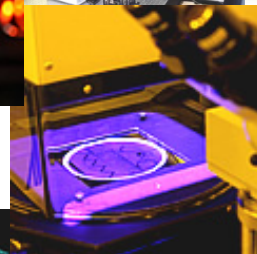
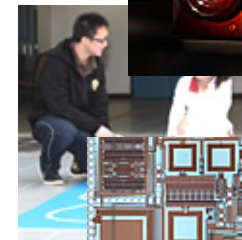
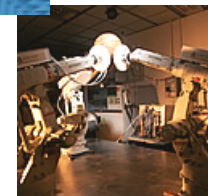
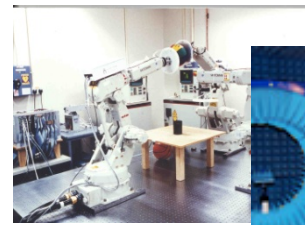
- Chinese University of Hong Kong, Hong Kong
- University of Texas, Dallas, USA
- University of Arizona, USA
- University College London, UK
- King's College London, UK
- Liverpool University, UK
- University of Manchester, UK
- Nanyang Technological University, Singapore
- National University of Singapore, Singapore
- The University of Western Australia, Australia
- Tsinghua University, China
- Harbin Institute of Technology, China
- Shanghai Jiatong University, China
- Zhejiang University, China
- Macau University
- Fudan University, China
- Peking University, China
- Open Univ. of Hong Kong
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- **Industry**

- Alcatel-Lucent Bell Labs, USA
- Lenovo, China
- Chartered Semiconductor, Singapore
- Perception Digital, Hong Kong
- Siemens Beijing, China
- ASTRI Co. Ltd, Hong Kong
- Silicon Express
- Solomon Systech Ltd (HK), Hong Kong
- InterDigital Communications, USA
- Intech LCD Group Ltd
- NTT Docomo, Germany
- Freescale Semiconductor Hong Kong Ltd.
- The 13th Institute, Shijiazhuang, China
- Broadcom, USA
- Mobilink, USA
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Extensive Experimental Facilities

- Over 40 labs and centers for teaching and research
 - Huawei-HKUST Joint Lab
 - HKUST-Qualcomm Joint Innovation and Research Laboratory (HQL)
 - Xilinx-HKUST Joint Lab
 - Partner State Key Lab (PSKL)- Advanced Displays and Optoelectronic Technology
 - NIE Social Media Lab
 - Wireless Communication Lab
 - Nano Fabrication Facility (NFF)
 - Center for Display Research (CDR)
 - Device Characterization and Test Lab
 - Integrated Power Electronics Lab
 - VLSI Design Teaching Lab
 - Signal Processing and Communications Lab
 - Final Year Project Lab
 - Shannon and Kirchoff Labs
 - Digital-Electronic & Microprocessor Lab
 - Automatic Control Lab
 - Center for Wireless Information Technology (CenWIT)
 - Photonics Technology Center
 - Human Language Technology Center (HLTC)



Industry Connections and Entrepreneurship

- **Strong impact on local/national community, industry and policy**
 - Industrial consortium
 - Source of future manpower for industry
 - Interconnects with industry
 - Entrepreneurship
 - We have a culture of startups among faculty and students
 - Perceptual Digital listed on main board of HKEx
 - Student industry experience
 - Career development
 - Internships
 - HR company FDMT
 - Research and Development
 - R&D contracts and consulting activities

Postgraduate Study Early Doctoral Admission Program (EDAP)

直博项目

up to 2017 Spring

PG Admission

- **EDAP goal: Admit top elite undergraduate students to the Ph.D program**
- **Every year, ECE admits around 100 students to our Ph.D program**
- **Around 20 students are admitted through EDAP**

EDAP Program Status

- **13 top universities in China, 24 schools/departments**

浙江大学

上海交通大学

复旦大学

东南大学

南京大学

中科大

哈尔滨工业大学

华中科技大学

西安交通大学

电子科技大学

南开大学

北京大学

清华大学

EDAP Process

- **Fall beginning, university recommends students**
- **ECE in-area faculty interview**
- **PG committee decision, issues offer**
- **Students choose supervisor**
- **Supervisor decision**
- **Nov. end, EDAP process completes**

EDAP Applicants Information

- Top undergraduate students from top universities, and elite programs

	Applicants	Offer	Acceptance rate
EDAP	~60	~25	42%
ECE Overall	~400	~100	25%

Top Quality

- **EDAP admitted students 2011-2017**
 - 165 students
 - >95% top10 in their home departments
 - >50% top3 in their home departments
 - 80 students with National Scholarship
- **127 EDAP students 2013-2017, 28 HKPFS awardees (Highest level of scholarship for Ph.D study in Hong Kong)**

Top Achievements

- **EDAP students 2011-2017**
 - **2011 students mostly graduated**
 - On average, each student published 5.3 journal papers, 5.3 conference papers
 - **2012 students in their 5th year**
 - On average, each student published 6.2 journal papers, 6.1 conference papers
 - **2013-2014 students in their 3rd-4th year**
 - On average, each student published 2 journal papers, 3 conference papers

东南大学

学院	联系老师	职务	电邮
电子科学与工程学院	邱峰老師		442073463@qq.com
信息科学与工程学院	洪伟教授/王婧菲老師		weihong@seu.edu.cn --> wangjingfei@seu.edu.cn
吴健雄学院	况迎辉教授		kuangyh@seu.edu.cn

	No. of Applications Received					Accepted by Dept				
	2017/18	2016/17	2015/16	2014/15	2013/14	2017/18	2016/17	2015/16	2014/15	2013/14
信息科学与工程学院	2	3	4	4	4	2	0	2	2	0
吴健雄学院	4	5	3	0	0	3	2	2	0	0
电子科学与工程学院	2	1	3	4	2	1	0	0	2	1

学生成就

- **17 students 2013-2017**
 - 7 National Scholarship
 - 2 HKPFS winners
- **Selected star students**
 - SUN Qiqi: graduated in 2016, 10 journal paper, 6 conference paper
 - JIANG Yibing: 17 journal papers, 6 conference papers
 - JIANG Huxing: 14 journal papers, 10 conference papers

Better EDAP?

- Home department is a share holder
 - Regularly review the program
 - Feedback students' achievements
 - Help on employment interview
- Procedure modifications?
 - Make offer before Sep. 10
 - Recruitment seminar in May