



Department of  
Biomedical Engineering

The Chinese University of Hong Kong

# BEng in Biomedical Engineering Programme Briefing



<http://www.bme.cuhk.edu.hk>



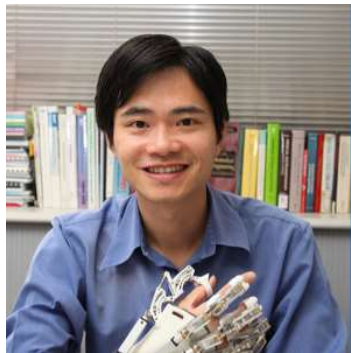
CUHK Biomedical Engineering

# Department of Biomedical Engineering

- ▶ 2006
  - Launch of the Graduate Division
- ▶ 2007
  - Launch of the MSc Programme
- ▶ 2010
  - Launch of the BEng (Hons) Programme
- ▶ 2012
  - Launch of the MPhil/PhD Programme
- ▶ 2017
  - Establishment of the BME Department



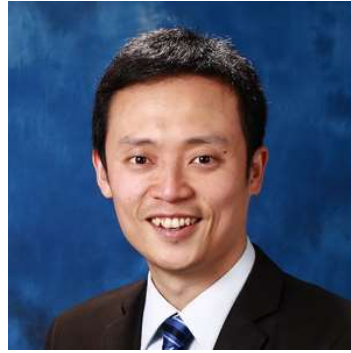
# BME Core Faculty Members



Prof. Raymond TONG  
Professor & Chairman



Prof. Liming BIAN  
Assistant Professor



Prof. Jonathan CHOI  
Assistant Professor



Prof. Aaron HO  
Professor



Prof. Megan HO  
Assistant Professor



Prof. Arthur MAK  
Professor



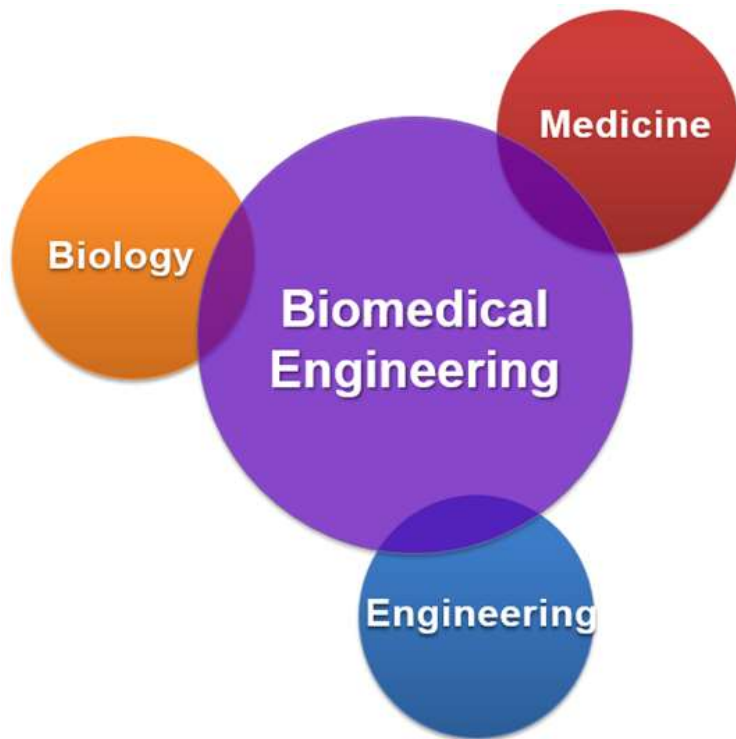
Prof. Renjie ZHOU  
Assistant Professor



# Highlights of Biomedical Engineering Programme

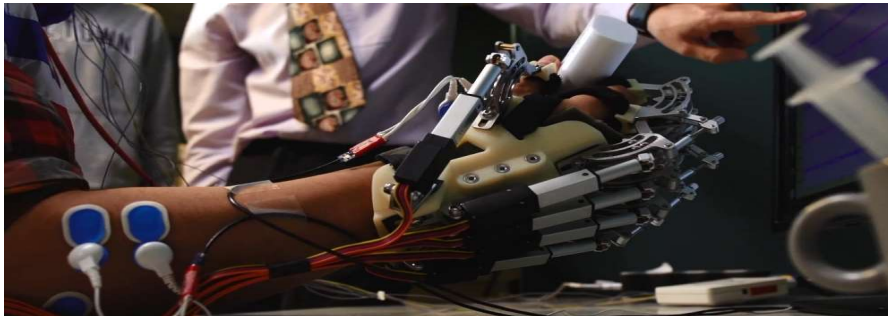
Prof. Raymond Tong

# Biomedical Engineering (BME)



- An interdisciplinary division offered by the **Faculty of Engineering** in close collaboration with the **Faculty of Medicine**
- Both basic and applied research
- Wide access to courses offered by different divisions
- Tailor-made learning programmes
- Individualized PhD candidacy examination

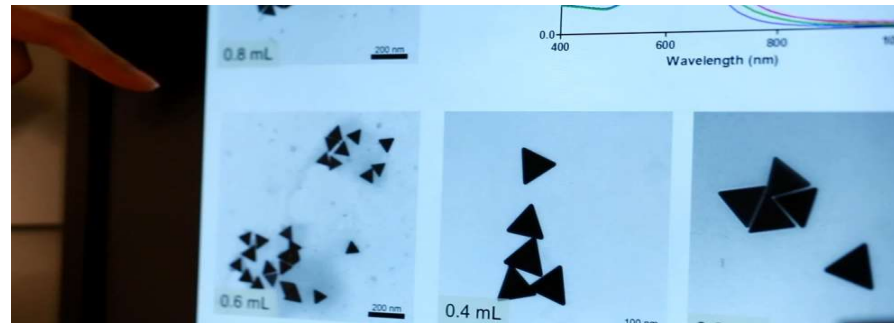
# Fields of Specialization in BME



▶ Medical Instrumentation & Biosensors



▶ Biomedical Imaging, Informatics & Modeling



▶ Molecular, Cell & Tissue Engineering

# Biomaterials and Regenerative Medicine



**BioFabrication and Characterization Laboratories**  
Prof. Arthur MAK  
Department of Biomedical Engineering and  
Department of Mechanical and Automation Engineering



**Biomaterials and Tissue Engineering Lab**  
Prof. Liming BIAN  
Department of Mechanical and Automation Engineering



**Musculoskeletal Research Laboratory**  
Prof. Ling QIN, Prof. Gang LI  
Department of Orthopaedics and Traumatology  
Faculty of Medicine

# Biomolecular Engineering and Nanomedicine



**Bionanotechnology Lab**  
Prof. Jonathan CHOI  
Department of Biomedical Engineering



**Biophotonics Laboratory**  
Prof. Aaron HO  
Department of Biomedical Engineering



**DNA nanosensors**  
Prof. Megan HO  
Department of Biomedical Engineering



**Advanced Nanomaterials & Micromachines Laboratory**  
Prof. Li ZHANG  
Department of Mechanical and Automation Engineering



# Medical Imaging and Informatics



Prof. Emma MacPHERSON  
Department of Electronic Engineering



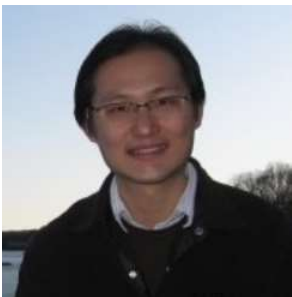
Prof. Thierry Albert BLU  
Department of Electronic Engineering



Prof. Xiaogang WANG  
Department of Electronic Engineering



Prof. Pheng Ann HENG  
Department of Computer Science and  
Engineering

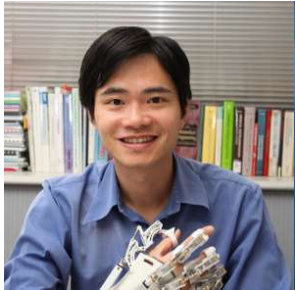


Prof. Kevin YIP  
Department of Computer Science and  
Engineering



Prof. Lin SHI  
Department of Medicine and Thereapeutics  
Faculty of Medicine

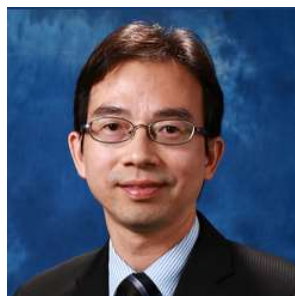
# Medical Instrumentation and Biosensors



**Biomedical Engineering Laboratory**  
Prof. Raymond TONG  
Department of Biomedical Engineering



**Medical Robotics Laboratory**  
Prof. Max MENG  
Department of Electronic Engineering



**Smart Materials and Structures Laboratory**  
Prof. Wei Hsin LIAO  
Department of Mechanical and Automation Engineering



**Multi-scale Precision Instrumentation Laboratory**  
Prof. Shih Chi CHEN  
Department of Mechanical and Automation Engineering



**CUHK Jockey Club Minimally Invasive Surgical Skills Centre**  
Prof. Philip CHIU  
Department of Surgery, Faculty of Medicine

# Minimum Graduation Requirements

University Core Requirements	
	<u>Units</u>
Chinese Language	6
English Language	9
University GE	9
College GE	6
Foundation Courses	6
IT (Equivalent to ENGG1110)	1(exempted)
PE	2
Total:	39

Free Electives: 10

Minimum Units for Graduation: **123**

Major Programme Requirements	
	<u>Units</u>
Faculty Package	9
Foundation Science Courses	9
Foundation Math Courses	12
Major Required Courses	27
Research Component Courses	6
Major Elective Courses	12
Total:	75

Let's talk about here

# Recommended Study Pattern: Year 2

	Units
<u>Year 2 - Term 1</u> <ul style="list-style-type: none"><li>• BMEG2001 Introduction to Biomedical Engineering</li><li>• BMEG2210 Orthopaedic Biomechanics and Musculoskeletal Injury</li><li>• ENGG2420 Complex Analysis and Differential Equations for Engineers</li><li>• SBMS1431 Human Anatomy and Physiology I</li></ul>	9
<u>Year 2 - Term 2</u> <ul style="list-style-type: none"><li>• ENGG2601 Technology, Society and Engineering Practice</li><li>• BMEG2011 Biomedical Engineering Laboratory</li><li>• BMEG2300 Circuits and Signals for Biomedical Engineering</li><li>• ENGG2450 Probability and Statistics for Engineers</li><li>• SBMS1432 Human Anatomy and Physiology II</li><li>• SBMS1440 Cell and Molecular Biology in Biomedical Engineering</li></ul>	14
<u>Year 2 - Summer</u> <ul style="list-style-type: none"><li>• ENGG2602 Engineering Practicum (A summer workshop; reserve your time &amp; take it in year-2 summer!!!)</li></ul>	1

**For Year 2 students, all required courses will be pre-assigned to you (unless there is time clash due to re-take foundation courses)**

# Recommended Study Pattern: Year 3-4

	Units
<u>Year 3 - Term1</u> Major required: (1) BMEG3430 Biomaterials and Tissue Engineering (2) BMEG3101 Medical Instrumentation and Design (3) BMEG3320 Biomedical Imaging  Major Elective: 1 BMEG3xxx / BMEG4xxx	12
<u>Year 3 - Term 2</u> Major Elective: 1 BMEG3xxx / BMEG4xxx	3
Year 4: Work-Study if you want to <b>Note: may get one unit from ENGG1820 Engineering Internship</b>	
<u>Year 4 - Term 1 (or Year 5 for workstudy)</u> Major required: (1) BMEG4010 Global Medical Device Regulatory Affairs (2) BMEG4998 Final Year Project I  Major Elective: 1 BMEG3xxx / BMEG4xxx	9
<u>Year 4 - Term 2</u> Major required: (1) BMEG4999 Final Year Project II  Major Elective: 1 BMEG3xxx / BMEG4xxx	

**Just talk to me or your Academic Advisor by then!**

# Stream Specialization

Students may choose not to specialize in any stream or **to specialize in one of the three streams and complete a minimum of 12 units of courses**, at most one elective at 2000 or below level, plus BMEG4998 and 4999[e], prescribed by the stream

## **Medical Instrumentation & Biosensors (MIB)**

TeleMedicine & Mobile Healthcare	Biofluids	Neuroengineering
Medical Robotics	BioMEMS	Bionanotechnology

## **Biomedical Imaging, Informatics & Modeling (MII)**

Bioinformatics	Biomedical Imaging	Biomedical Modeling
Medical Imaging Applications	Sound and Light Waves in Medicine	

## **Molecular, Cell & Tissue Engineering (BCTE)**

Cell Biology	Genetic Engineering	Bionanotechnology
Biomolecular Engineering	BioMEMS	

# Academic Advisor

██████████ ID: ██████████ 

[student center](#) [general info](#) [academics](#) [admissions](#) [financial aid](#)

## ██████████ Student Center

**Academics**

[My Class Schedule](#)  
[Shopping Cart](#)  
[My Planner](#)

other academic...  

 Deadlines  URL  Gradebook

**This Week's Schedule**

	Class	Schedule
	BMEG 2001-- LEC (4896)	Mo 1:30PM - 2:15PM Y.C. Liang Hall 103
	BMEG 2210-- LEC (7344)	We 10:30AM - 11:15AM Institute of Chin Studies L1 Tu 4:30PM - 6:15PM William M W Mong Eng Bldg 407
	BMEG 2210--T01 TUT (7377)	We 11:30AM - 12:15PM Institute of Chin Studies L1
	CHEM 1380-B LEC (7507)	Tu 1:30PM - 2:15PM Science Centre L1 Th 3:30PM - 5:15PM Science Centre L1
	CHEM 1380-BT01 TUT (7508)	Tu 2:30PM - 3:15PM Science Centre L1
	CHLT 1200-GH LEC (4181)	Th 12:30PM - 3:15PM Y.C. Liang Hall G03

**SEARCH FOR CLASSES**

**Enrollment Dates**  
[Open Enrollment Dates](#)

**Advisor**  
**Program Advisor**  
Professor TONG Kai Yu  
[details](#)



**Check on CUSIS  
who is your  
academic advisor**

# Town Hall Meeting

- ▶ We will organize Town Hall Meeting as one of the student-staff consultative channels every term to let BME students (all years) and BME teachers come together to share any opinion, suggestion, discussion regarding study life, academic issues etc.
- ▶ The Town Hall Meeting for this term is **6:30pm on 20 Nov 2017 (Monday)**. You will receive email invitation when date is confirmed.





# Work-study Programme

Prof. Aaron Ho



# Work-study Programme

- ▶ 16 current students have joined the work-study programme in 2016-17
- ▶ A University supervisor is assigned to you and he/she will visit you **at least twice** during your placement
- ▶ >8 weeks of full-time internship (with approval by the Faculty and Department), you can register the **1-unit ENGG1820 course** as free elective
- ▶ After completion, you and your industrial supervisor should submit a report to the Department

# BME Work-study Employers

2013-14	2014-15	2015-16	2016-17
Employer	Employer	Employer	Employer
ASM Pacific Technology Ltd.	ASM Pacific Technology Ltd.	AML Health Plus Ltd.	ITE Smartcard Solutions Ltd.
AML Health Plus Ltd.	Automatic Manufacturing Ltd.	Electrical and Mechanical Services Department	AML Health Plus Ltd.
The Hongkong and Shanghai Banking Corp. Ltd. (HSBC)	Medisen Ltd.	Medisen Ltd.	Electrical and Mechanical Services Department
ITE Smartcard Solutions Ltd.	Paul C. Lauterbur Research Centre (SZ)		
Ove Arup & Partners Hong Kong Ltd.			
Paul C. Lauterbur Research Centre (SZ)			
Sengital Ltd.			

# ASM Pacific Technology Ltd.



## Lead Frame Solutions

One-stop packaging solution from lead frame design to assembly process optimization. With vast product portfolio, leading-edge technologies, operation-efficient factories, we value-add for you.



## Copper Bonding Solutions

Field proven!



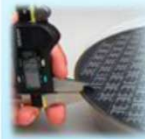
## Stacked Die Solutions

Our Layers of Challenges



## Advanced Fine Pitch Solutions

World's best 30µm BPP



## Encapsulation Solutions

You are protected!



## LED Solutions

One-stop Solution for LED Packaging and Manufacturing



## Image Sensor Applications

Sole Leader in providing particle-controlled image sensor in-line assembly solutions



## Highlighted Products



## LEXIWAY

Tracking Device and System

Our tracking device uses satellite GPS technology coupled with cellular's location based services to determine the precise location of a vehicle, person or asset to which it is attached.

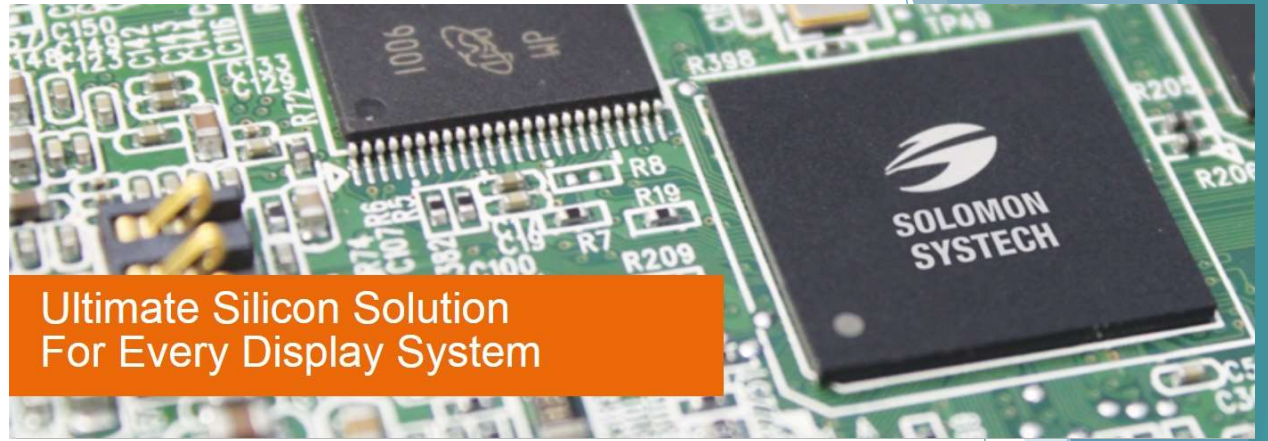


## Ngong Ping 360

Public Announcement System

We have successfully developed and installed a Public Announcement System for Ngong Ping 360, the cable car system in Hong Kong.





Ultimate Silicon Solution  
For Every Display System



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### Embedded Solutions

AirPrime® Modules |

Programmable modems



### Networking Solutions Routers & Gateways

AirLink® | InMotion Solutions™



### SIMs, Connectivity & Cloud Services

Smart SIM | AirVantage IoT Platform

# More Job Information

<http://pip.cintec.cuhk.edu.hk>

(for Pre-final Year Students only)



# Overseas Exchange Programme and Engineering Practicum

Prof. Arthur Mak



# Overseas Exchange

- ▶ To gain different learning experience
- ▶ To know the world
- ▶ To know other people
- ▶ To reflect and to plan for the future





# Term-time Exchange Program



# Term-time Exchange Program

- ▶ 6 month - 12 month
- ▶ With partner institution (agreement signed on credit transfer)
- ▶ Normally you pay CUHK tuition fee, no matter where you go
- ▶ Large-scale, open to all disciplines
- ▶ Some of the institutions target specifically at engineering students (e.g., UIUC, KTH)
- ▶ Applications centrally administrated by OAL (Office of Academic Links: <http://www.oal.cuhk.edu.hk>)
- ▶ Watch out the application deadlines !

## Short-term Exchange Programs

- ▶ Usually summer time
- ▶ May or may not be with credit transfer
- ▶ College-administrated cultural interflow or thematic study
- ▶ Engineering Faculty's programs
  - ▶ Research based or course based
  - ▶ With financial support
  - ▶ e.g., Charles Kao Overseas Research Exchange Scheme, Peking University GLOBEX summer school

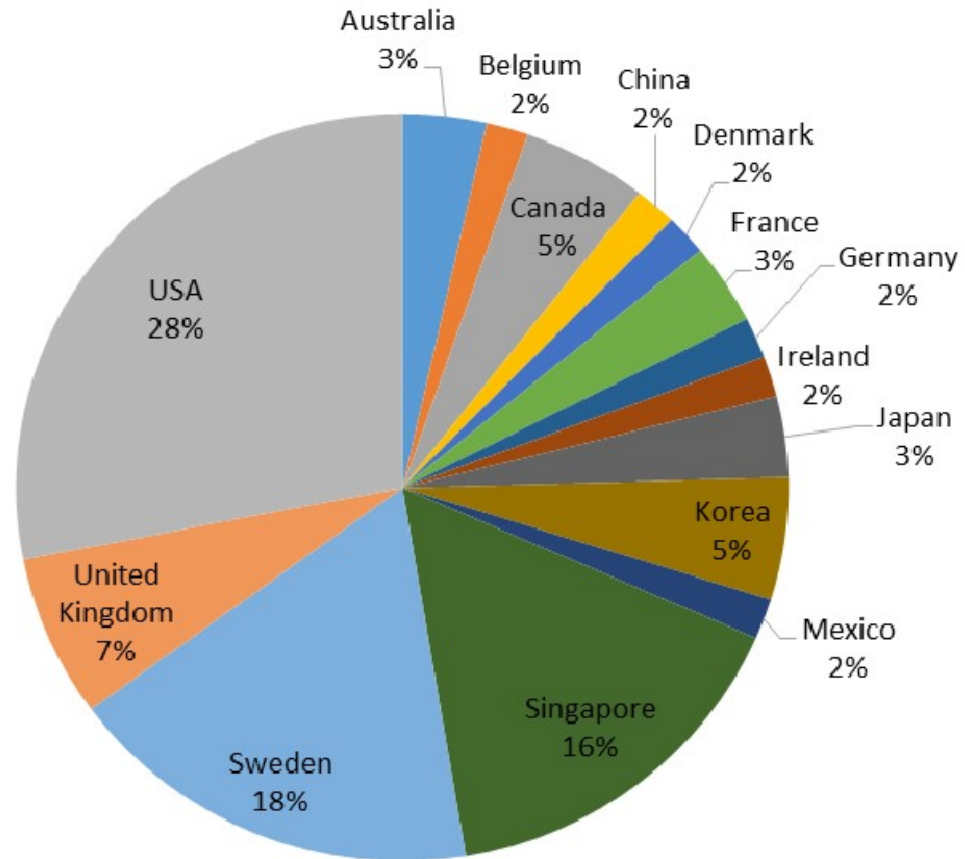
# Considerations

- ▶ Objective: general experiential learning or discipline-specific study
- ▶ Are you ready to meet possible cultural and study challenges ?
- ▶ Where to go ?
- ▶ Which year should you go ?
- ▶ Does the target institution use English to teach ?
- ▶ Credit transfer matters:
  - ▶ Could the courses you take during exchange be transferred to CUHK and counted as graduation requirements ?
  - ▶ Approval process of credit transfer

# Preparation

- ▶ Get a good GPA
- ▶ Take English test (e.g., IELTS)
- ▶ Search for information, ask your seniors who went exchange
- ▶ Improve interview skill
- ▶ Make clear study plan
- ▶ Contact the department about credit transfer possibility
- ▶ Know the expense and prepare
- ▶ Communicate well with parents

## Outgoing Engineering Exchange Students (2016-17) Distribution by Region of Destination



<b>Host Institution (2016-17 Regular Term-time)</b>	<b>No. of Engineering Student(s)</b>
Australia - The University of Melbourne	2
Belgium - Katholieke Universiteit Leuven	1
Canada - The University of British Columbia	1
Canada - University of Toronto	2
China - Tsinghua University	1
<b>Denmark - Technical University of Denmark (Engineering and Science Programme)</b>	<b>1</b>
<b>France - TELECOM SudParis (Engineering Programme)</b>	<b>1</b>
France - Universite Catholique de Lille	1
Germany - Albert-Ludwigs-Universitat Freiburg	1
Ireland - The University of Dublin, Trinity College	1
Japan - Doshisha University	1
Japan - Soka University	1
Korea - University of Seoul	2
Korea - Yonsei University	1
Mexico - Tecnologico de Monterrey	1
Singapore - Nanyang Technological University	1
<b>Singapore - Nanyang Technological University (Engineering Programme)</b>	<b>4</b>
<b>Singapore - National University of Singapore (Engineering Programme)</b>	<b>4</b>
<b>Sweden - Chalmers University of Technology (Engineering Programme)</b>	<b>2</b>
<b>Sweden - KTH Royal Institute of Technology (Engineering and Science Programme)</b>	<b>4</b>
Sweden - Lund University	1
Sweden - University of Gothenburg	1
Sweden - Uppsala University	2
<b>United Kingdom - University College London (Engineering Programme)</b>	<b>3</b>
<b>United Kingdom - University of Southampton (Maritime Studies - Engineering Programme)</b>	<b>1</b>
USA - American University	1
USA - Baylor University	1
USA - Brown University	1
<b>USA - Dartmouth College (Engineering Programme)</b>	<b>1</b>
USA - Rensselaer Polytechnic Institute	1
<b>USA - Stony Brook University (Engineering Programme)</b>	<b>2</b>
USA - The Pennsylvania State University	1
USA - University of California, San Diego	1
USA - University of Illinois at Urbana-Champaign	1
<b>USA - University of Illinois at Urbana-Champaign (Engineering Programme)</b>	<b>2</b>
USA - University of Massachusetts Amherst	1
<b>USA - University of Pennsylvania (Engineering Programme)</b>	<b>1</b>
USA - University of South Carolina	1
USA - University of Wisconsin-Madison	1
<b>Total</b>	<b>57</b>

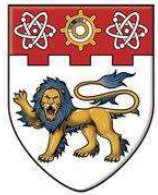


國立臺灣大學  
National Taiwan University

UNIVERSITY OF  
Southampton



創価大学



NANYANG  
TECHNOLOGICAL  
UNIVERSITY





Enjoy vibrant campus life and go on exchange!

Faculty international exchange opportunities

- ▶ GLOBEX Summer Programme@PKU
- ▶ HIT - WALL . E@Harbin Institute of Technology
- ▶ Prof. Charles Kao Research Exchange Scholarships Scheme

# Special exchange opportunities for ELITE students



**European Innovation Academy  
Summer Experiential Programme in Beijing  
Workshop on Skills for Success -  
Effective Entrepreneurship and Leadership**

# Engineering Practicum (ENGG2602)

- ▶ Mandatory training workshop held in the summer term of Year 2 study
- ▶ Students must attend and complete this workshop to satisfy the graduation requirements

# Introduction to Scholarships

Prof. Megan Ho



# Why Scholarship?

- ▶ Financial benefit
- ▶ Looks good on your resume



# Types of Fellowships

- ▶ University Scholarships

- Coordinated by Office of Admissions and Financial Aid (OAFA)

- <https://www.oafa.cuhk.edu.hk/sfas/open-for-application/scholarships>

- ▶ Departmental Scholarships

- Notification via e-mail from time to time

- ▶ College Scholarships

# Departmental Scholarships

- ▶ Biomedical/Electronic Engineering Outstanding Achievement Scholarships
- ▶ Charles Kao Scholarship
- ▶ Professor Charles K. Kao Research Exchange Scholarships
- ▶ Chen Chih-Fan Scholarship
- ▶ T. Y. Wu Foundation Scholarships
- ▶ Winbridge Scholarship for UG Exchange Programmes
- ▶ ....etc

# Requirements

- ▶ Academic Merit
- ▶ Financial Need
- ▶ Community Service (e.g. Hang Seng Community Service Scholarship)
- ▶ Extracurricular Activities (International Prizes, Competitions, etc)
- ▶ Local/International



# Scholarship Tips

- Study hard and do well (academic achievement)
- Actively participate in international competitions and/or community service
- Seek out opportunities
- Nomination required
- Inform our administration with your updated CV

