



THE HONG KONG  
POLYTECHNIC UNIVERSITY  
香港理工大學

DEPARTMENT OF INDUSTRIAL AND SYSTEMS ENGINEERING  
工業及系統工程學系

# Hong Kong Product Design Makeathon

## 全港中小學產品設計大賽 2018-19

協辦機構



支持機構（排名不分先後）



資訊科技教育領袖協會  
Association of I.T. Leaders in Education

贊助機構（排名不分先後）



STRUCTURE  
SENSOR



Tiertime

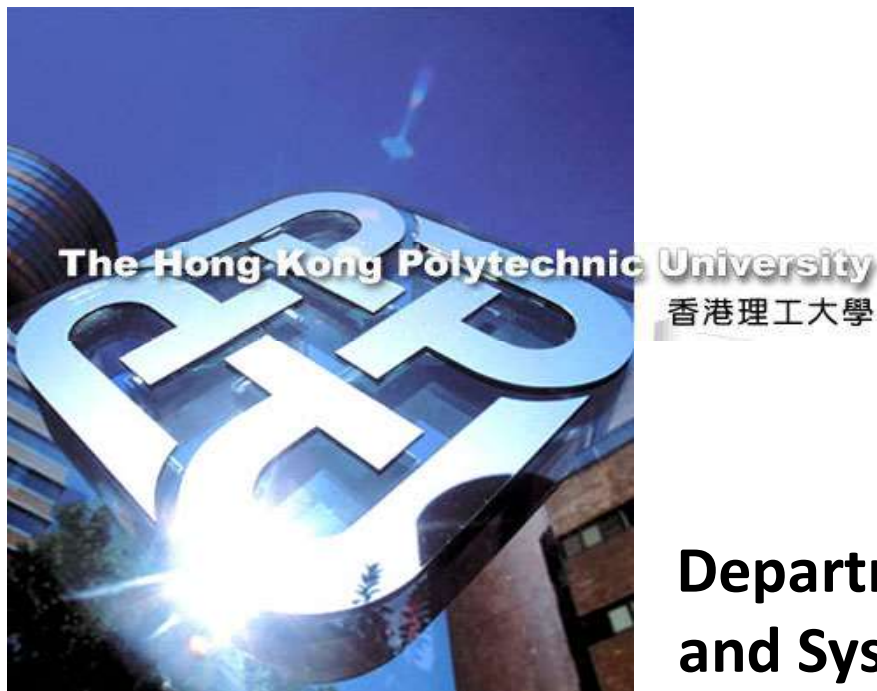
支持媒體



香港電腦教育學會  
The Hong Kong Association  
for Computer Education



# Department of Industrial and Systems Engineering



**Dr. Y.M. Tang**  
**Department of Industrial  
and Systems Engineering**

## *“Integrated Engineering Programmes with Flexible Career Prospects”*

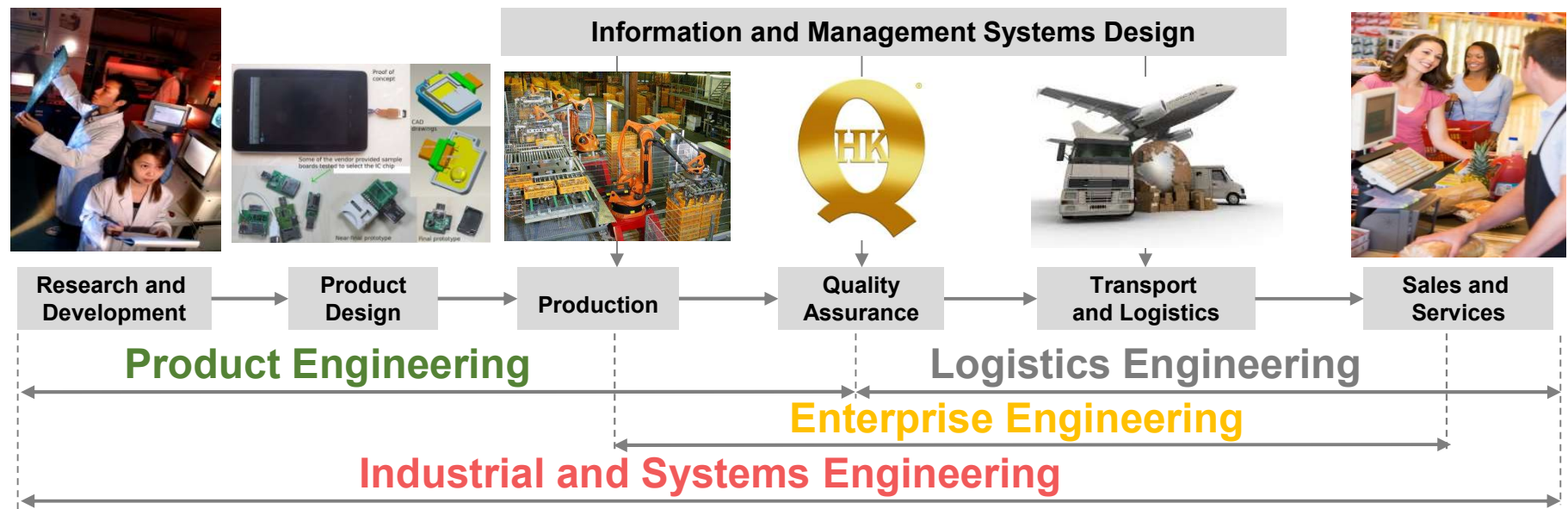
(JUPAS Programme Code: JS3557)



(JUPAS Programme Code: JS3571)

BACHELOR OF ENGINEERING (HONOURS) SCHEME IN  
**PRODUCT AND INDUSTRIAL ENGINEERING**

BACHELOR OF SCIENCE (HONOURS) SCHEME IN  
**LOGISTICS AND ENTERPRISE ENGINEERING**



*ise* A Highway to Professional Success.

*We Make a Difference Everywhere.*



# ISE makes a difference everywhere

- design, improvement and installation of integrated system of people, technology and information
- best of both worlds: an education in both **engineering** and **business**

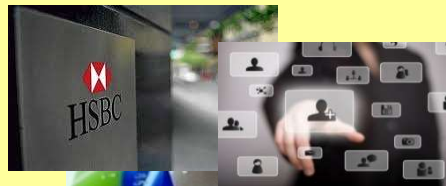


- *Efficiency*
- *Effectiveness*
- *Quality, Safety and Reliability*

## Transportation



## Post Office



## Bank



## Healthcare

## Logistics



## Industrial



## Utilities and Government



## Theme Park



Daily Life Applications



## App搜尋車位 助停車場管理

政府早前提出發展「聰明城市」，建議將區內車位統一管理。理工大學研發一條龍車輛智能停泊導航平台，駕駛者可通過手機應用程式，搜尋附近停車場的空位，配合導航系統駕駛前往。團隊利用設置在停車場的不同感測器，偵測空缺位置、可疑人士，除提供實時泊車資訊，亦可防範偷車罪案，目前已有逾三十個停車場採用。隊伍獲瑞士日內瓦國際發明展頒發評判特別嘉許金獎及特優獎。

記者 魏綺婷

**泊**車位難求，遇上假日或繁忙時段，駕駛者可能要幾經波折才覓得一車位。理工大學工業及系統工程學系團隊耗資約四百萬元，在三年多前開發智能停泊導航平台，並獲信和集團採納，在港九新界轄下三十多個停車場使用。

駕駛者可先用手機應用程式，查詢鄰近停車場當下的車位空缺、時租收費，預約車位及繳費，再利用

# 理大智能泊車導航 國際發明賽奪金

導航系統駛至選定目的地；然後運用智能手機在入口處拍機入閘，作收費記錄，兼統計場內使用率。

## 減低偷車罪案率

團隊在停車場內的泊車位，分別裝上無線感應器，偵測該位置的停泊狀況。系統採用無線網絡，連結場內感應器，並利用物聯網及雲端，傳遞實時資訊來往支援中心及駕駛者。工業及系統工程學系專任導師何道森指，「停車場內設動作感應器，如有陌生人走近，可即時傳送警報予管理公司，追看該區閉路電視，盜絕偷車賊。」他又稱，場內亦配置二氧化碳感應器，一旦室內含量超標，可調節抽風系統，保持空氣流通。

## 逾30停車場採用

理大工業及系統工程學系副教授葉偉雄稱，系統應用的停車場，部分位處於工廠大廈及商場，兩者雖有不同營運模式，但技術操作類同，如要擴展網絡，連接至全港停車場亦沒有問題。除駕駛者得益，系統亦同時便利管理公司。葉偉雄指，公司可通過系統了解不同時段的停車場車流，從而檢討營運效率，提升服務質素。



■理工大學工業及系統工程學系副教授葉偉雄(左二)及專任導師何道森(左三)研發汽車智能停泊導航平台，獲頒發日內瓦國際發明展的評判特別嘉許金獎及特優獎。  
魏綺婷攝

至於《施政報告》提出以九龍東作試點，推行「聰明城市」，包括以智能手機檢視各區交通流量、泊車位置等，概念與理大團隊不謀而合，葉偉雄指，沒有參與該研究項目，但樂意與相關部門接洽。



# Internet of Things (IoT)

11.9.2015 Fri | skypost.hk

晴報

News

28

Smart City  
系列之2



曾否想像每天起床，可從一部手機得知泊車位空缺、甚至可遙控家中電器開關，為你慳電？一切在Smart City（智慧城市）裏不再是空想。「智慧城市」結合互聯網、大數據、物聯網等科技，管理市民生活。本報將探討本港在物聯網、交通和環保節能上，發展「智慧城市」的現況與機遇。

星韓已應用 保障長者安全

首爾 定位及閉路電視技術，若老人、小童、殘疾人士離開安全區，會啟動智能設備求救按鈕

新加坡 老人智慧警報系統，可監測長者日常活動，發生意外時可及時通知照顧者

連上物聯網 醫療安全大進步

## 感應器追蹤 病人狀況無遺漏



人口老化勢不可擋，醫療需求愈趨殷切。在「物聯網」世界，只需有感應器和互聯網，家屬便可遙距掌握老人、失智症病人的狀況，包括有否服藥、跌倒及走失等。記者：蕭穎妍

「物聯網」（Internet of Things, IoT）是智慧城市重要基礎，利用傳感器、無線射頻識別技術（RFID）等，聯繫一切物件到互聯網，令物件變得可追溯和識別，正廣泛用於物流及交通上。而近年「物聯網」更涉足至醫療領域，日本、歐美等地已採用。根據美國退伍軍人事務部數字顯示，以該技術識別病人身份和追蹤用藥分量等，可減少醫療

失誤達65%至86%。

科技園公司QBS為長者研發附有RFID標籤的手帶，當他們離開安全範圍或跌倒時，系統會發出警報；QBS亦研究以低耗電藍牙技術，遙距傳送長者的體溫、脈搏等資料予醫生或家人。QBS工程總監關秉源稱，今年第四季與一所老人院合作，在50個老人中先抽出10人試用手帶。為避免私隱外洩，手帶可以亂碼加密資料。

### 手帶遙距監察身體情況

除科技公司，理大亦與博愛醫院屬下的屯門護養院合作，三年前採用電子管理系统，追蹤醫護治療病人的紀錄，提升管理效率。理大工業及系统工程學系助理教授李嘉敏指，該系統配備類似「Apple Watch」的手帶式感應器，醫護人員可遙距得知病人情況，「更可定位精神病、失智症病人，防止走失。」

### 藥樽貼標籤 派錯響警報

「食錯藥」是常見失誤，理大去年與一所特殊學校合作，協助校方派藥，在藥樽上安裝RFID標籤，並紀錄服藥時間等，派藥時再配對學生檔案，若派錯藥會發出警報。另外，外國有研究在儀器上加設RFID標籤，手術後進行掃描，以便偵測有否遺漏器具於病人體內。

香港應科院智能生活組總監劉文建指，正與診所合作，在病人家中設置血壓的智能設備，可以短信等通知醫生及親屬，「心臟病人會水腫，觀察體重變化可估計有否惡化。」

私隱問題是隱憂，但病人安危遠更重要，紀錄由主診醫生保管，可減低洩露風險

理大工業及系统工程學系助理教授李嘉敏



### 何謂RFID技術

RFID是Radio Frequency Identification縮寫，又稱電子標籤，當標籤接收閱讀器發出的射頻訊號，便會發送存儲在晶片內的信息，閱讀器獲得信息便會解碼，由系統進行數據處理。



### 理大發明 手袋感應器

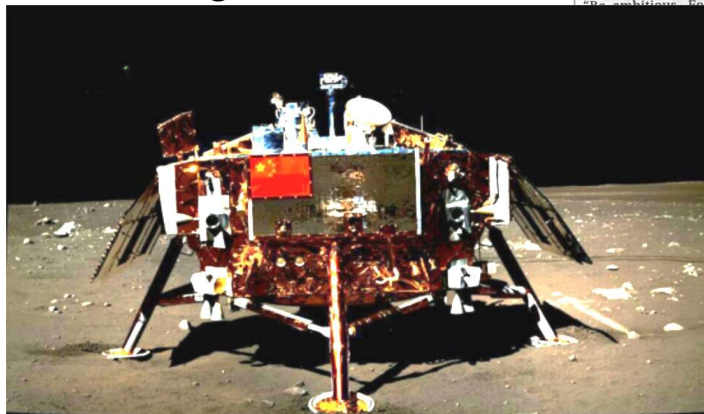
名牌手袋價值不菲，但仿真度高的「A貨」卻俯拾皆是。為保障消費者，理大研發了「Check It Yourself」系統，融合近距離無線通訊（NFC）技術及雲端計算等，製造商只需在手袋夾層安裝感應器，消費者購買時通過手機程式掃描手袋，便可顯示拉鍊、皮扣等來源地、詳細描述及經銷商，從而辨別真偽。

李嘉敏稱，「物聯網」亦用於追蹤貨物，為防止被盜，可利用電子封條鎖住貨櫃，一開即觸動警報系統。本港機場早於2012年起，以RFID標籤每日處理約七萬件行李，成最早使用物聯網和感應器的城市。

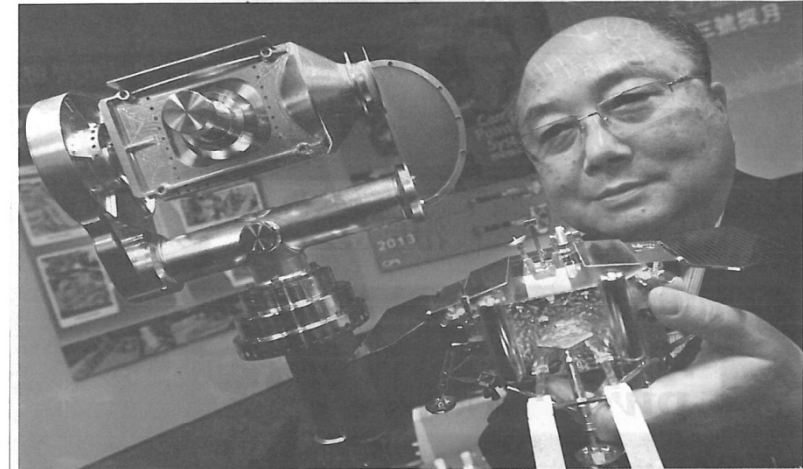
# The Lunar surface sample acquisition and sealing system prototype for Chang'e 5

The recent successful functioning of the PolyU developed and made Camera Pointing System (CPS) on Chang'e-3 lander which soft landed on the surface of the Moon in December 2013, has made **PolyU the only University in the region that has a functioning instrument on the surface of the moon.**

CAST has up to now provided/pledged research funding of over RMB60 million for another mission which will be launched in 2017. It will take back lunar regolith for China the first time.



MOON LANDING



Professor Yung Kai-leung with his camera pointing system, which has proved instrumental to China's lunar landing. Photo: Dickson Lee

## Lunar hero says reach for the stars

With one of his gadgets now hard at work on the moon, professor gives his advice to the young

Ng Kang-chung  
kc.ng@cmp.com

"Be ambitious. Follow your dream. The professor's camera pointing system on board China's Chang'e-3 lunar probe is now hard at work allowing precise pictures to be taken on the moon. It is the first time an instrument developed and produced in Hong Kong has been used in China's lunar programme since its launch in 2007. Professor Yung said: 'I feel very proud to be able to take a part in the mission.' It is only the third so-called soft landing on the moon - as opposed to a high-velocity land-

ing in which the probe is destroyed. Having graduated from Shau Kei Wan Government Secondary School in 1978, he pursued a degree in engineering at the Hong Kong Polytechnic University.

He initially worked as a design officer at a trading company. His dream was to work in the space field, so he left for British Columbia to join the Polytechnic in 1980. He became an associate professor and head of the department of information systems engineering in 1995.

Professor Yung is a member of the elite intergovernmental space exploration organization, the European Space Agency.

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Study Life

# Exchange to Overseas Universities

Our students participated in outbound exchange programme and studied in **Denmark, Finland, Canada, The Netherland, Singapore, Sweden, USA, Taiwan and Mainland China.**



Shanghai Jiao Tong University, **China**



Kyung Hee University  
**Korea**



Shanghai Maritime University, **China**



Tampere University of Technology,  
**Finland**



University of Washington  
University of Michigan  
**USA**



Copenhagen Business School, **Denmark**





# Student Awards

HKCS Outstanding  
ICT Achiever Awards  
2015: Young ICT  
Achiever



The Chartered Institute  
of Logistics &  
Transport Hong Kong  
(CILTHK)



First runner-up in  
HKIE 2016 Essay  
Competition "SMART  
Logistics and  
Transportation"



First Runner-up  
Award HKSQ  
Student Project  
Competition 2015

Innovation and  
Technology Scholarship  
Awards 2014; Cyberport  
Creative Micro Fund  
(CCMF) of HK\$100,000,  
2014



CILTHK Logistics &  
Transport Student  
Final Year Project  
Award 2015



Platinum Award  
for Innovation"  
GSC: PolyU Pre-  
challenge 2012-13



Championship, H.K.  
Society for Quality  
Company-Based  
Student Project  
Competition 2014

# Industry-related Final Year Project

- Each student will **collaborate with a company** and work on a **specific topic** under the **supervision of an academic staff member and a staff member from the company**.
- It provides a **real-life working experience** where students can apply what they have learnt in the classroom for making improvements or solving real world problems.



- **Some examples:**
  - Mattel Inc
  - PCCW Solutions
  - Sino Group
  - Hong Kong International Airport
  - Tuen Mun Hospital
  - Cathay Pacific Airways Limited
  - HAECO
  - Kerry Logistics
  - Hongkong Post





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## ***Four Degree Programmes under 2 Schemes***

### **Scheme in Product and Systems Engineering**

- BEng (Hons) in Product Engineering with Marketing
- Beng (Hons) in Industrial and Systems Engineering

### **Scheme in Logistics and Enterprise Engineering**

- BSc (Hons) in Enterprise Engineering with Management
- BSc (Hons) in Logistics Engineering with Management

