What is an EE education worth?

Professor Sir David MacKay passed away on 14 April 2016 at the age of 48. He died of cancer. With his demise, the world lost a great mind. The world also lost a role model of one who showed us the power of applying mathematics and the laws of physics to complex issues like sustainable energy and renewables as well as righting a grave miscarriage of justice in a high profile court case. Sir David MacKay read Natural Sciences (Experimental and Theoretical Physics) at Trinity College, Cambridge and received the BA degree in 1988. Thereafter he went to the California Institute of Technology as a Fulbright Scholar, where he enrolled under the newly created Computation and Neural Systems PhD program. He was awarded the PhD degree in 1992 for his highly interdisciplinary work. He returned to Cambridge University the same year as a Royal Society Research Fellow in the Cavendish Laboratory (the Physics Department of Cambridge), and was made a University Lecturer (the starting teaching post equivalent to Assistant Professor) in 1995. He was soon promoted to the rank of Reader (roughly equivalent to full Professor) in 1999 and then again in 2003 to Professor of Natural Philosophy (equivalent to a Chair/Endowed Professorship). He was elected Fellow of the Royal Society in 2009 for his contributions to Information Theory, Machine Learning and Neural Networks. As recognition of his contributions to the hot debate on climate change, he was appointed by Her Majesty the Queen as Regius Professor of Engineering in 2013. Regius professorships are royal professorships specially created by the reigning monarch; there are only 8 such professorships in the whole of Cambridge. He was knighted in 2016 for his services of scientific advising to the government and outreach, and hence carries the title of “Sir”.

Outside of academic circles, Sir David MacKay is best known for his 2008 self-publication, “Sustainable Energy: Without the Hot Air”, which remains free for download from his website. In this book, MacKay not only showed his cool-headedness and brilliance but also mastery in making things accessible to the public. This is epitomized by his clever use of standard power units in a way the common man can relate to: expressing 1 kW as a 40 W lightbulb left continuously on for 24 hours. Using this standard unit based on lightbulbs, he goes on to show the realities of how much energy we consume and comparing the numbers against how much energy different types of renewable sources provide. His book dares to ask the hard questions by taking a hard look at the numbers, and cuts through the common sincere but ignorant emotional talk. This is clear from the beginning of the book, which starts with a quote that reads, “We live at a time when emotions and feelings count more than truth, and there is a vast ignorance of science.” Reading his book for a reality check on the challenges we face regarding sustainable energy will make you think again the next time we have another Earth Hour! His cool-headed quantitative approach of allowing the numbers to speak for themselves (in language that the public can comprehend) caught the public’s attention and the notice of the British government. Owing to his numerate approach to the debate, he was appointed chief scientific advisor to the Department of Energy and Climate Change in 2009.

We have much to learn from Sir MacKay in how we value an EE education. A rigorous training of the mind in mathematics and science, as unequivocally exemplified in an EE curriculum, is not just about leverage to a well-paying job (Yes, our EE graduate starting salaries are well above of the University’s average). I would go as far as to argue that Sir MacKay’s testimony shows us that the overarching philosophy of an EE education ultimately makes you a better person: a person equipped with the tools of mathematics and science to peer into society’s complex problems in a way that nobody else can. These are people with a unique way of looking at the world, for which the world desperately needs. So you find EE difficult? Well it should be because not everyone can stomach it. But if you survive the drills, you will come out a
better person with a rare gift that the world needs. The challenge thereafter is to communicate truth with clarity so that all who are willing to listen might come to benefit from knowing the truth.

2015, more than 450 nominated projects were accepted and there were a total of 25 First Prizes. Every year, there is only one First Prize in the field of Electronics and Information Technology.

2016 IEEE Communications Society Stephen O. Rice Prize in the Field of Communications Theory

Dr Taejoon Kim, Assistant Professor of EE, has recently received the 2016 IEEE Communications Society Stephen O. Rice Prize in the Field of Communications Theory, the IEEE Transactions on Communications Best Paper Award. The winning paper, co-authored with scholars from Purdue University and Nokia Networks, is “Millimeter Wave Beamforming for Wireless Backhaul and Access in Small Cell Networks”, IEEE Transactions on Communications, Vol. 61, No. 10, pp. 4391-4403, October 2013.

The award is only given to one paper each year which was published in the IEEE Transactions on Communications in the previous 3 calendar years. The award is named after Stephen O. Rice, a pioneer in the fields of information theory and communication theory.

Prof Quan Xue, Chair Professor of EE, has been conferred First Prize of Guangdong Science and Technology Award 2015 (廣東省科學技術獎－等獎) by the Guangdong Provincial Government. The winning project, competed under the Scientific and Technological Progress category (科學技術進步類) and jointly conducted with scholars mainly from South China University of Technology, is titled “Research on the Miniaturization and Low Power Consumption of Radio Frequency Systems”.

The Award was set up to encourage the development of science and engineering and recognize the achievement in the said area. In 2015, more than 450 nominated projects were accepted and there were a total of 25 First Prizes. Every year, there is only one First Prize in the field of Electronics and Information Technology.
**Staff Movement**

**Promotion**

Congratulations to the following academic and administrative staff on their promotions!

**Prof K W LEUNG** appointed to Chair Professor from 1 July 2016

**Dr H C SO** promoted to Professor from 1 July 2016

**Miss Angela FOK** promoted to Clerical Officer I from 1 April 2016

**Ms Kate SZETO** promoted to Clerical Officer I from 1 April 2016

**Student Achievements**

**Winning Gold and Silver Awards at JOS Innovative IT Project Awards 2015/16**

Three EE students, who teamed up with students from different departments of CityU, have won the Gold and Silver Awards in the JOS Innovative IT Project Awards 2015/16.

- **Gold Award**: Mr LIU Xinhong (INFE, 2013 entering major) and Mr WU Haotian (ECE, 2013 entering major), supervised by Dr Ray Cheung, for the project “QNO - A Mobile Solution to Queuing Problems”.

- **Silver Award**: Mr Revanth BANALA NITHYANANDAM (ECE, 2015 entering major), for the project “Self-transformable Wheelchair”.

Organized by Jardine OneSolution (JOS), the contest aims to encourage students to apply technology, together with their creativity to build smart and innovative IT Solutions, which make our world a more efficient and better place to live.

*Winners of Gold Award*

*Winners of Silver Award*
Winning Champion, 1st and 2nd Runners-up in HKIE Project Competition 2016 “IoT Development for Smart Cities”

Our PhD and MPhil students have won a total of 3 prizes in the HKIE Project Competition 2016 “IoT Development for Smart Cities”.

- **Champion**: Mr CHENG Chun Sing (MPhil student), co-supervised by Dr Ricky Lau and Prof Henry Chung, for the project “Smart Battery Health Monitoring and Diagnostic System”.

- **1st Runner-up**: Mr CHI Hao Ran (PhD student), supervised by Dr K F Tsang, for the project “Optimal Vents Design and Control Management for Indoor Air Quality Improvement in Green Buildings”.

- **2nd Runner-up**: Mr HUNG Faan Hei (PhD student), supervised by Dr K F Tsang, for the project “An Accurate Indoor Localization Technique”.

Organized by The HKIE Electronics Division, the project competition aims to increase the awareness and knowledge of IoT technologies of Hong Kong people, as well as to nurture engineers and students to effectively use and apply IoT technologies to improve the quality of life.

Champion of 2014 -15 Best Final Year Energy Project Competition by Energy Institute (Hong Kong Branch)

Mr Abdulmecit GUNGOR, ECE graduate in 2015, has won the Champion of 2014 -15 Best Final Year Energy Project Competition (Individual Project) which was organized by the Energy Institute (Hong Kong Branch). The competition aims to recognize the best final year project related to energy for the university students in Hong Kong. His winning Final Year Project, supervised by Prof Henry Chung, is titled “3-D Transmitting Coil Structure with one Parallel Transformer Coil”.
Electronic Product Design Competition 2016

~ Henry Chung ~

EPD Competition is an annual activity for ECE students taking EE3004 Electronic Product Design. The competition aims at promoting the interest of our students in learning electronics and developing students’ generic skills through project learning. The project of this year is Smart Robot Car. Four groups of students have won the Gold Award, Creative Idea Award, Silver Award and Bronze Award, respectively.

Their names are as follows:

**Gold Award**
IP Chui Lin, KWAN Tak Kai, TO Ching Yi

**Silver Award**
CHU King Hei, CHU Man Hin, LEE Wai Ching, MOK Ka Hei

**Creative Idea Award**
LAM Cheong Kwan George, LIU Aruhan, RELEKAR Akhil, SUN Hang

**Bronze Award**
CHOW Sum Ming, LIU Tiffany Hsuan

Design Project Award Recipients

To realize the Discovery Enriched Curriculum (DEC), EE3274 Design Project is developed for CE students. The course aims at cultivating the creativity and innovation ability of students. It teaches students how to create and evaluate ideas, and the process of prototype and product development. Students are required to design a prototype/product based on an original idea that comes up by themselves through discussions and market research.

This year, the following awards were given to outstanding projects:

**Innovation Award**
Project title: Sight Keeper
CHAN Ting Yau, LAM Ho Ming, NG Chi Him, YIU Tsz Long

**Commercialization and Marketing Award**
Project title: We Volunteer!
HOU Ka Lun, HUNG Shen Man, WONG Kai Yin, YAU Wing Tat

**Champion, Presentation Award**
Project title: Confession
CHOI Yat Long, HE Mengran, KONG Sin Kin, XIN Yan

**1st Runner Up, Presentation Award**
Project title: Sight Keeper
CHAN Ting Yau, LAM Ho Ming, NG Chi Him, YIU Tsz Long

**2nd Runner Up, Presentation Award**
Project title: Locky: Smart Access Control
CHONG Wai Shing, HA Chung Ho, TARNG Shih Chao, YAM Chepond
Information Product Design Competition 2016

Information Product Design Competition is integrated in the course of EE3316 Information Product Design. This year, three groups of students have won the Gold Award, Silver Award, Bronze Award and Innovative Idea Award respectively.

Their names are as follows:

**Gold Award**
Project title: Spell Genius
CHOY Cheuk Piu Richard, LAU Kin Wai, LAM Nga Sze, LUK Isabel Pui Yin, WONG Ka Kit, YUEN Pui Shan

**Silver Award**
Project title: Old Hong Kong
CHAU Kwan Yin, CHEUNG Cheuk Fai, LI Johnman, OR Ka Ming, TAI Ho Man

**Bronze Award and Innovative Idea Award**
Project title: Virtual Piano
LIN Ruiyuan, TIAN Yongqiang, YAO Xuewen
Activities

Annual Dinner 2016

~ Teresa Chow ~

EE的年度盛事春茗晚宴，於2016年2月27日假又一村花園俱樂部圓滿舉行。一如往年，同事們及其家人，以至校友，都非常踴躍參與，當晚一共延開二十三席，場面好不熱鬧。

今年，我們以當下最熱門的科技“Big Data”作為是次晚宴的主題。打頭炮的是“Big Songs”，先有EE張國榮之稱的 Dr Bernard Chiu，以及EE小花Dr Lin Dai，分別獻唱「當年情」及「蜀綉」。而為是次歌唱環節牽手高潮，當然是EE的殿堂級組合“E All Stars”為大家演唱「朋友」及「明天會更好」兩支曲目。成員包括充當結他手的Dr Leanne Chan和Dr Rosa Chan，以及EE歌王歌后—Prof K M Luk，Prof K F Man，Prof Stella Pang，Dr Steve Wong及Prof Quan Xue。其歌聲之美妙吸引了一眾與會者尤如小粉絲般圍聚在台前爭相拍照，場面既熱鬧，也溫馨。

遊戲環節是每年少不了的節目。今年再接再厲，由韓籍老師Dr Taejoon Kim主持“Big Games”，Dr Kim對EE一眾同事的面部器官、髮型及輪廓進行大數據分析，找出EE同事們的面相共同特徵，並以此作為藍本，讓大家猜猜擁有某些面部特徵的是誰。遊戲不但有趣，亦增進了大家對同事們樣貌的認識。

“Big Brothers”乃是次晚宴的壓軸環節，當中播放由Dr Steve Wong構思，並聯同三位EE本科生製作的“Big News Big Heads”短片，讓大家回顧歷屆系主任上任的年度，世界上同時發生了什麼大事，而今年正值台灣及美國總統大選之年，襯托出新一階系主任誕生的重要時刻。此環節亦在Prof Henry Chung及Dr Eric Wong的主領下，邀請了幾位具代表性的教授，包括 Prof Ron Chen，Dr Lin Dai，Prof Andrew Leung，以及即將卸任的系主任Prof K F Man，與大家一同回望過去，展望將來。

是次晚宴得以圓滿結束，實有台前幕後各同事的鼎力支持及相助。在此謹代表EE感謝積極投入參與在當晚各個環節中的每位。期望著來年大家繼續踴躍參與！

Dr Bernard Chiu獻唱「當年情」

「蜀綉」 — 由Dr Lin Dai獻唱

E All Stars (左起): Dr Steve Wong, Prof K F Man, Prof Quan Xue, Prof K M Luk, Prof Stella Pang, Dr Leanne Chan, Dr Rosa Chan

感謝EE校友的踴躍參與！
Career Talks by Renowned IT and Electronics Companies held on 7 March

Career advising is one of the emphases the Department specially puts resources in. With the support from the industry, on 7 March 2016, delegates from renowned IT Companies were invited to give career talks on-campus to our final year undergraduate and master students. Participating companies were:

- Atos Information Technology (HK) Ltd.
- KPMG
- Deloitte Touche Tohmatsu
- PCCW Solutions
- Hong Kong Telecommunications

Our EE graduates came back to share with us their career hunting and development experiences.

Miss Candy Lo, Graduate Trainee
Atos Information Technology (HK) Ltd.
(2014 BEngIE graduate)

Mr David Liu, Solutions Executive
Bid & Solutions Consulting, HKT Limited
(2014 BEngECE graduate)

Break-out sessions were arranged to let students know more about the companies and the jobs, as well as facilitating the on-site applications.
Adventure Camp for EE Student Ambassadors 2016

13 EE student ambassadors of 2016 and Scheme Coordinator, Mr Van Ting, went through a 2-day adventure camp from 20 – 21 February 2016. Students were divided into teams to plan their own route and completed the hiking in a combination of orienteering, team cooperation and communication, and adventure navigating. To survive in the wild environment, they had to cook by themselves by sourcing resources from the nature like woods for building fire. Coupled with a variety of challenging activities such as rope skipping and dragon boat paddling, students were trained on team building, leadership and effective communications. All these are very practical skill-set for effective team work in any other occasions throughout their life.

The 2-day experiences were consolidated by a self-reflection and sharing session at the end of the camp. For student ambassadors’ sharing on the adventure camp, please refer to P. 24.
Interflow Tour to Singapore

EE Student Ambassadors of 2015 and Scheme Coordinator, Mr. Van Ting, travelled to Singapore for an academic and cultural exchange from 4 – 8 January 2016.

They visited Nanyang Technological University and Singapore University of Technology and Design for an exchange session with the engineering students and faculty there. Through introductions by the local students and the teachers, laboratory visits and campus tours, EE students were exposed to the history and culture of the universities, as well as the teaching and learning style in Singapore.

Apart from visiting universities, our students also visited the NEWater Visitor Center and the Art Science Museum to learn more about the technological development in Singapore. Besides academics, they visited some famous landmarks in Singapore such as Merlion Park, Gardens by the Bay, Little India and Kampong Glam to taste the history and culture of Singapore.

Please turn to P. 26 for student ambassadors’ sharing.
Secretary for Innovation and Technology visited CityU and EE’s Laboratories on 3 May 2016

Mr Nicholas Yang Wei-hsiung, Secretary for Innovation and Technology, Hong Kong SAR Government, visited City University of Hong Kong (CityU) on 3 May 2016 to learn more about the University’s research- and innovation-related activities.

Apart from a meeting to report CityU’s recent achievements and development in research and innovation, Mr Yang visited two EE’s laboratories during the campus tour, the State Key Laboratory of Millimeter Wave and the Centre for Smart Energy Conversion and Utilisation Research.

Leaded by Prof C H Chan, Director of The State Key Laboratory of Millimeter Waves, the research team introduced to Mr Yang the cutting-edge facilities for research on millimeter-wave and terahertz technologies.

With the company of Prof Henry Chung, Director of the Centre for Smart Energy Conversion and Utilisation Research, Mr Yang was introduced the latest research facilities and projects on power electronics and its applications. In particular, Prof. Chung shared with Mr. Yang the highlights on the smart city project with General Electric, IEEE smart village project with the IEEE Industrial Electronics Society, and smart battery diagnostic systems with the Electrical and Mechanical Services Department.
人們必須知道，我們必將知道
~ 陳關榮 ~
Wir müssen wissen, wir werden wissen（我們必須知道，我們必將知道）——這是大衛・希爾伯特1930年退休感言的結束語，鐫刻在哥廷根城市墓地（Stadtfriedhof Götingen）裡他那簡單墓碑的下方。

David Hilbert (1862-1943)

希爾伯特是歷史上最卓越的數學家之一，在不變數理論、代數數論、積分方程、變分法、泛函分析、數學和幾何學基礎、數學物理等領域中作出了十分重要的貢獻。今天，「希爾伯特空間」、「希爾伯特變換」、「希爾伯特矩陣」、「希爾伯特曲線」等冠以其名的術語和他那有趣的「希爾伯特旅館悖論」均廣為人知。

1900年，38歲的希爾伯特在巴黎舉行的第二屆國際數學會議上以「數學問題」為題的演講中提出了23個重要的數學難題，即衆所周知的「希爾伯特問題」，激勵和推動了後來一個多世紀許多數學分支的蓬勃發展。簡而言之，希爾伯特的第1-6問題關於數學基礎理論，第7-12問題關於數論，第13-18問題屬於代數和幾何，而最後的第19-23問題屬於數學分析領域。經過許多數學家長期的努力，目前大多數問題都得到了完全或部分解答。得益於他本人的研究興趣和當時的歷史條件，希爾伯特問題中未能包括拓撲和微分幾何等重要領域的數學問題，也基本上沒有涉及應用數學和計算數學。當然，沒有人會苛求希爾伯特用23個問題去涵蓋浩瀚的數學分支和內容。實際上，二十世紀數學的發展遠遠超出了希爾伯特當時的設想。

希爾伯特的第二問題是有名的「判定問題」，它至關重要，涉及整個數學基礎，開心數學是否完備和一致？是不是所有數學命題都可以通過有限次正確的數學步驟作出判定？希爾伯特雄心勃勃，要將整個數學體系嚴格公理化，然後用他所謂的「元數學」（證明數學的數學）來證明整個數學體系是堅不可摧的。為了這個目標，他制定了他所稱之為「希爾伯特計劃」的部署：首先，將所有數學形式化，把每一個數學陳述都用符號來表達，然後，證明整個數學系統是完備的，即對任何一個數學陳述都存在一個數學證明。同時，還要證明數學是一致的，也就是說絕不存在自相矛盾的陳述。最後，還要有一個可以實現的演算法，通過有限步程式最終判定數學陳述的對錯。顯然，這是一個野心勃勃的宏圖大計，但希爾伯特並不認為它是不可能的。他非常自信，斷言「不存在不可解的問題」。

遺憾的是，「希爾伯特計劃」在他1930年光榮引退後隨即慘遭失敗。1930年9月7日，時年25歲的哥德爾（Kurt Friedrich Gödel, 1906-1978）發表了著名的「不完備性定理」：「如果數學是一致的，那麼它就是不完備的」。具體地說，哥德爾證明了：任何一個包含算術系統在內的數學系統不可能同時是完備和一致的。
時是完備的和一致的。換句話說，人們如果能在一個數學系統中做算術的話，那麼這個系統或者是自相矛盾的，或者存在一些結論在這個系統內是無法證明的。其次，他證明了，對於任意一個包含算術系統的數學系統來說，不可能在這個系統內部證明它本身的一致性。哥德爾的結論對當時整個數學界來說無疑是一次顛覆性的衝擊。希爾伯特特別無選擇，旋即對計劃作了修正，取消了有限步驟這個約束。隨後，根茨（G. Gentzen, 1909-1945）於1936年使用某種非形式化方法（超限歸納法）證明了算術公理系統的一致性。雖然這一切與希爾伯特的初衷有別，但是他的元數學、形式化和證明論的基本思想依然深刻地影響了許多後世數學家。


高斯認為是歷史上最重要的數學家之一，享有「數學王子」的盛譽。他出生於平民家庭，父親一生做雜工，母親沒有文化。高斯自幼聰穎好學，他7歲時巧妙地算出級數1 + ... + 100的和的故事家喻戶曉。高斯1825歲當選聖彼得堡科學院外籍院士，30歲出任哥廷根大學數學教授。人們對他用圓規直尺作圓內接正十七邊形特別是最小平方法和正態分佈耳熟能詳。他的數學貢獻涵蓋數論、代數、統計、分析、微分幾何、複變函數、矩陣理論等許多方面，並曾對非歐幾何有過創始性的研究。高斯與威廉·韋伯一起從事磁學研究（因而產生了磁通

高斯同時又是一個物理學家和天文學家，一生成就極為豐碩，對數學、力學、天文學、電磁學、大地測量學、地球物理學以及天文学都有卓越貢獻，以他名字命名的成果有一百多個。高斯和威廉·韋伯一起從事磁學研究（因而產生了磁通

Department of Electronic Engineering, City University of Hong Kong
密度單位：1 韋伯/平方公尺 = 10000 高斯)。畫出了世界上第
一張地球磁場圖並確定了地球磁南北極位置，並一起設計了
前所未有的有線電報機。高斯還憑藉數學計算準確地預測了
谷神星 (Ceres) 的存在並由此啟導了智神星 (Pallas) 以及
其他一些行星的發現，之後兼任過哥廷根大學天文學教授和
天文台台長。高斯畢生在哥廷根大學任教，直至 77 歲時於睡
夢中安然辭世。高斯的第一教授位置先後由狄利克雷和黎曼
接任。

高斯一生衣食簡樸、深居簡出。據說他只參加過一次學術會
議，就是 1828 年柏林自然科學工作者大會。他不涉足政治，
不參與公開爭論，對關於自己的流言蜚語也不正式辯解，
即使在 1837 年 11 月 18 日著名的「哥廷根七君子」 (Göttinger
Sieben) 事件中，當包括語言學家格林兄弟、高斯的長期合
作者物理學家威廉·韋伯以及高斯自己的女婿東方學家埃瓦
爾德 (G. H. A. von Ewald) 等七位著名學者因抗議國王廢除
憲法而被集體解職時，高斯也保持緘默。高斯是個完美主義
者，一般不發表未成熟和自覺價值不高的論著。他培養的博
士學生不多，但卻有高足黎曼、戴德金、莫比烏斯 (August
Möbius) 和貝塞爾 (Friedrich Bessel)。由於高斯自身的勤奮
努力和極高水準的學術貢獻，他在哥廷根引領出一個數學
學派。他本人的數學文匯《高斯全集》 (Carl Friedrich Gauss
Werke) 共 12 卷，由眾多著名數學家參與編輯，其出版歷時六
十多年 (1863-1929)，在克萊因統籌主導下完成。

值得一提的是高斯的學生黎曼，在學術上完全秉承了導師嚴
謹的治學風格。黎曼只有短短的四十年人生，正式發表的論
文不多，可是他的名字卻頻繁地出現在後來的數學文獻裡，
諸如黎曼積分、黎曼引理、黎曼映照定理、黎曼-希爾伯特問
題、柯西-黎曼方程、黎曼曲面、黎曼流形、黎曼空間，特別是
黎曼的黎曼 zeta 函數。黎曼留給後
人的最大難題是著名的「黎曼猜想」，即希爾伯特 23 個問題
中的第 8 問題，它要求回答黎曼 zeta 函數的非平凡零點是否全
部位於複平面實部 1/2 的直線上？這是一個至今懸而未決的
最重要的數學問題之一。據說希爾伯特老年時曾被人問道：
「假如你去世後有一天能夠復活，那麼您會去做什麼呢？」
希爾伯特毫不遲疑地回答：「我會首先去打聽黎曼猜想解決
了沒有。」

克萊因之後，克萊因引領出了哥廷根數學學派的第二個盛強時
期，即克萊因-希爾伯特時期。

克萊因在 1871 年服完兵役後來到哥廷根大學出任數學講
師，開始了他的學術生涯。次年，23 歲的他便被埃爾朗根
(Erlangen) 大學聘為數學教授。之後，他曾在慕尼黑高等技
術學院和萊比錫大學任教。克萊因 1886 年回到哥廷根大學
並在那裡工作至 1913 年 64 歲退休。1872-1895 年間克萊因
任《哥廷根數學年刊》主編，期間還編輯了《數學百科全
書》並親自編寫了第 4 卷。克萊因 1885 年被英國皇家學會選
為外籍院士，1908 年擔任在羅馬召開的國際數學家大會主
席，1913 年被選為利奧波第那科學院 (Deutsche Akademie der
Naturforscher Leopoldina，即今天的德國科學院) 院士。

克萊因最廣為人知的是他的「克萊因瓶」，概念上和「莫比
烏斯帶」類似，簡單有趣，引人入勝。克萊因最出名的是他
1872 年在埃爾朗根大學哲學系和大學理事會上所做的題為
「關於近代幾何研究的比較考察」的演講，被後人稱為「埃
爾朗根綱領」，論證了如何把多種幾何 (黎曼幾何除外) 統
一在變換群論觀點之下。

克萊因具有非凡卓越的組織和領導能力。他最成功的是組織
並帶領了哥廷根數學學派乃至整個哥廷根大學自然科學學派
在世界學術原野上異峰突起。1893 年，克萊因從芝加哥世界
博覽會回國後，有感於美國理論研究在工業應用上的成功，
開始宣導理論與實踐相結合，引導哥廷根大學的自然科學突
破純科學與實際運用之間的界線，以適應科學繁榮與工業化
時代的需求，竭力促進數學、力學和其他基礎學科在工程技術中的應用，並在哥廷根大學成立了應用力學系。克萊因也張揚並鼓勵哥廷根大學聘用了大批當時最優秀的自然科學家，例如1895年把希爾伯特從哥尼斯堡大學以正教授引進。1900年，希爾伯特便以克萊因的「埃爾朗根綱領」為基礎扛起了世界數學家首領的大旗。希爾伯特也十分關注物理學，還專門把他認為「數學較差」的愛因斯坦請到哥廷根大學討論，後來稱為愛因斯坦方程的物理學含義。討論中，哥德爾為愛因斯坦方程找到了一個精確解，讓他滿載而歸。1902年，克萊因把開司丁斯基請到哥廷根大學任教。他是幾何學大師和數學物理學科創始人之一，是愛因斯坦的數學老師，他為愛因斯坦日後創立相對論奠定了堅實的數學理論基礎。1904年，克萊因還把卡爾·龍格（Carl Runge，1856-1927）請到哥廷根工作，同時推薦了工程學出身的路德維希·普朗特（Ludwig Prandtl，1875-1953）為應用力學系主任。以普朗特和他的學生馮·卡門（Theodore von Kármán，1881-1963）為代表的近代力學學派首先在哥廷根大學成長發展，那是和克萊因的努力分不開的。現在哥廷根大學有許多新的學科，僅在1896年至1907年間，該校就建立起來應用電子學、應用力學、應用數學、應用物理學、應用電子學，並在這六個新學科都聘請了當今世界一流的領銜教授。例如1905年到訪哥廷根大學的斯蒂芬·費舍爾（Stephen Timoshenko，1878-1972），1909年到任的愛德蒙·朗道（Edmund Landau，1877-1938）以及1920年去職的理查·柯朗（Richard Courant）。事實上，要列出克萊因時期一個接一個的訪問客都包括在內的清單是累贅困難的，即使只限於數學方面人們也很容易就能找到諸如霍普夫（Heinz Hopf）、阿廷（Emil Artin）、亞歷山大洛夫（P. S. Alexandroff）、范德瓦爾登（Bartel van der Waerden）、費勒（William Feller）和波利亞（George Polya）。克萊因也曾寫道：「克萊因像上帝般地統治著哥廷根，他神一樣的力量主要來自於他的個性和對工作的熱心奉獻以及做好事情的能力。」

由於克萊因的卓越領導，哥廷根大學還不斷開闢出新的交叉學科。僅在1896至1907年間，該校就誕生了世界上最早的物理化學、電子物理學、應用數學、應用力學、應用電子學，並在這六個新學科都引進了當今世界一流的領銜教授。在那些自然科學最後基礎的學科如物理化學以及醫學中，哥廷根大學也開闢了許多新的專業方向，推動並實現了哥廷根大學從人文社會科學向自然科學轉移。事實上，哥廷根大學的科學家們在第一次世界大戰前，是在希爾伯特、德拜、弗蘭克、哈恩、玻恩等人的領導下，已經開始了原子物理方面的研究，從而使哥廷根成為最早的「世界原子核物理中心」。後來成為美國原子彈之父的奧本海默以及曼哈頓工程中最为傑出的一批科學家全是當年哥廷根大學勤奮好學的年輕學子。有趣的是，多年之後，在1955年4月12日由18位聯邦德國的原子物理學家和諾貝爾獎得主聯名發表了著名的《哥廷根宣言》，呼籲各國政府使用氫彈的核戰爭將給人類帶來毀滅性的災難，敦促他們放棄以武力作為實現政治目的的手段，表達了科學家強烈的社會責任感。

哥廷根大學和哥廷根學派後來的低落完全歸罪於納粹。1930-40年代第二次世界大戰時期，希特勒迫害猶太人的黑色恐怖塗炭了哥廷根大學，迫使幾乎所有的哥廷根學派成員移居美國。這個歷史轉折讓哥廷根大學從此一蹶不振，卻無意中幫助當時學術自由、包容並蓄的美國成就了新的一代輝煌。
《禮記》是戰國時期儒家關於禮儀的重要論著，收集有孔子的學生及其他儒家們的一些作品。《禮記·儒行》中說：“其難進而易退也，粥粥若無能也”，從此引發出後來的一句成语“粥粥無能”，指沒有能力辦事。

《文子》，唐代以後改名為《通玄真經》，則是道家的一部重要論著。主要解說老子言論，闡發老子思想，傳說為老子的弟子文子所作。《文子·自然》中說：“法度有常，下及無能”，其中“無能”指缺乏能力之人。

縱觀歷史，橫看今朝，“無能”是一個貶意之詞，不會有人願意用它來做自己的名字。然而中國奇人怪事層出不窮：明代福建晉江塘東村，出過一位名人，姓蔡名鼎，字可挹，號無能。“蔡無能”的稱謂或許是效法道家的“無為”哲學，不過他本人並沒有留下注釋。

這位蔡無能，生於明朝萬曆十六年（即1588年），自幼聰穎，勤讀好學，年輕時熟習《易經》，繼承程朱理學，並喜歡抨擊時弊，“多發前人所未發”。熹宗時期，東林黨人孫承宗督師薊遼，聘蔡無能為山海關閣部參謀。據說他曾擺下一個“鼎陣”，用沙土埋下許多鐵鍋，引誘敵人騎兵經過，馬蹄被鐵鍋套住而無法跑動，結果明軍打了一個大勝仗。天啟六年（即1626年），熹宗賜封他為“白衣參軍”。這位新官嫉惡如仇，第二年便抗節上疏，痛陳宦官魏忠賢十大罪行。不料皇帝卻寵信奸臣，致使蔡無能成了“粥無能”。他於是怒棄官職，南歸故里，隱居於卓望山南麓的西資岩下。

然而惡人終無善報，明崇禎即位之後，魏忠賢伏法。崇禎隨即命人繪像訪尋蔡無能，詔其複職。蔡無能接旨後卻辭不拜命，皇上戲稱他為“蔡布衣”。1644年明朝滅亡，朱聿鍵次年在福州登位，改號隆武，命黃道周為宰相。在黃道周力薦之下，隆武帝馳詔三聘，請蔡無能出山，許諾封他為左軍師。無奈蔡無能一再辭謝，依然深居西資岩，著書授學。

蔡無能遺留世間著作有《激論》和《萬遠堂稿》等，特別是《易蔡集解》十卷，約五十萬字，後來收錄在福建《泉州文獻叢書》中。
無能蔡先生公祠有一副門聯

帝稱布衣，天子不得臣。諸侯不得友。
書成易蔡，往聖由此繼，來學由此開。

祠中還有對聯

抗節誰傳當日口，殘編可惜是星經。

薦牘重勞黃閣老，參軍不薄白衣人。

這裏，“抗節”句指蔡無能抗衡魏忠賢，而“薦牘”句指黃道周力薦蔡無能。祠前有一“觀易亭”，是蔡無能當年讀易經觀星象之處。亭南石壁上刻有落款“蔡鼎”的“古卓望”三個大字。亭柱上刻有對聯

易老書成蔡，道高客作卿。

自古名人多軼事，蔡無能也不例外。

傳說明代晉江地區有一位頗具名望的看山先生洪三才，是當朝宰相的妹婿。他看中了塘東村這塊風水寶地，想遷居於此，可又擔心自己是外姓人，會與本村蔡氏家族衝突。他想了一個主意，先試試村民中有沒有能人。於是他發了一個公告：“三日內村中蔡氏鄉民若有辦法使我離開所坐交椅者，賞百金。”告示一出，村民騷動：大家都不明白為何這位老先生會發如此告示，但又非常好奇，都想方設法讓他離開，只是沒有成功者。到了第三天傍晚，一個小孩子高舉著一封書信，從遠處跑到先生座前：“先生，您母親的家書到了！”先生聽罷，立刻起身迎接：“家書抵萬金啊！”小孩高興地笑了：“哈哈，先生，只抵百金。您現在不就離開交椅了嘛?”

在西資岩的一方石壁上，依然保留著蔡無能書寫的“慧眼”二字。慧眼為佛教用語，又稱靈眼，可以洞察凡間一切。今人有“慧眼看世界”之說。
Apollon: Solar-powered Car Project
(Sharing from the project team, edited by Dr Joshua Lee)

Our project team comprised over 20 undergraduates students from the Departments of Electronic Engineering (EE) and Mechanical and Biomedical Engineering (MBE). The name of our team was Apollon (赤輪 in Chinese). Our team’s goal was to build a solar-powered car to compete in the “New Energy New Generation” Solar Car Competition organized by the Environment Bureau. The challenge laid down by the competition organizers was to build a solar-powered car that would cover a distance of 3 km within 15 minutes. Given the complexity of the problem at hand, we decided to organize the workflow in a way that would tap into the respective expertise of the EE and MBE students in the team. The EE students focused on the aspects of harvesting and converting solar energy into usable electricity while the MBE students focused on the aspect of minimizing consumption of the energy that had been harvested and converted. It was clear from the start that the students from both backgrounds had to work closely given that these two aspects were intertwined.

The team as a whole took away many lessons on solving real problems in the process of building the solar-powered car. For example the EE students in the team had to come to grips with specifications of exactly how much power was needed to deliver the required task and how much space was practically allowed for the solar panels to fit. Having worked out the requirements, the team then could source for suitable solar panel models. In the search process for an adequate solar panel model, the team came to discover for themselves the range of solar technologies out there in the market including how they work and how well they deliver on energy conversion. Having sourced for a suitable solar panel model, the EE students in the team then had the task to implement a module to convert the energy from solar panels into electricity that could be used to power the vehicle. In the process of thinking about various design implementations, the team also came to realize that their design choices have actual physical limitations in the context of a real problem. Assumptions based on ideal conditions were tossed away one by one as the team considered the different practical scenarios one by one. Issues that one would have easily dismissed as simple were brought into new light as we considered actual scenarios. One of the practical issues the team had to grapple with was regulation of power. In terms of the source, one had to face the fact that the intensity of light was not going to be constant which would inevitably translate to large variations in the amount of energy harvested from the solar panels. In terms of usage, the demand for power also varies depending on the actual situation of the vehicle. For example, speeding up the vehicle and having it go up an incline would require drawing more power. This presented an extremely daunting challenge that felt way beyond the capabilities of a team of undergraduate students. On hindsight, the challenge of having had to face a difficult task that was beyond the comfort zone of the team opened up opportunities for the team to reach out to the supervisors from EE – Prof Henry Chung and Dr Ricky Lau. The need to find solutions and leverage expertise beyond what was available in the team also led to collaborations with researchers and staff from the Centre for Smart Energy Conversion and Utilization Research (CSCR).

As for the MBE students, the project also provided a crash course of moving beyond the ideal conditions assumed in the lecture notes to facing practical challenges when building an actual vehicle. And this was not just any vehicle as it had to be powered by solar energy. So the car design had to be designed and constructed to make do with as little energy available as possible. The MBE students thus had to source for a suitable material that should be fairly lightweight to construct the frame of the car. They also had to consider the energy harvesting requirements (i.e. space and size) put forth by their peers from EE when designing the topology of the car. When it came to material selection, the team had to face the dilemma of whether to stick to something they were familiar with (e.g. Aluminum and other metals) or take risks and go with something new like carbon fiber (that would better fit the bill). Another caveat is that carbon fiber is also trickier to handle than metals when it comes to constructing frames. In the end, the team went ahead with the unfamiliar and more challenging option of using carbon fiber. Having had no prior experience of handling carbon fiber in their classes, our MBE teammates had to learn how to process carbon fiber themselves. After three months of experimentation and hard work, we finally had a strong and lightweight frame constructed out of carbon fiber. In designing the shape of the vehicular frame, our teammates from MBE had the
chance to put their class lessons on aerodynamics and numerical methods to practical use in order to lower wind resistance and reduce the power budget. This enormous task required running many tests and numerical simulations to come up with a vehicular frame topology that would seamlessly cut through the air.

Now we stand proud with our solar-powered car, which we have fashioned out of our own hands and minds. In the process of realizing this beauty, we have made new friends and learnt the importance of team work. We have been changed for the better through the process of discovery, having had to try out many different things for the first time. We have also experienced the benefits of working across disciplines (between EE and MBE) when it comes to solving real problems as well as expanding our scope of collaborators (working with researchers and academics). We slept over on campus on many nights while working on the project and we have gotten to know the campus and the university much more intimately. This has by far been the best experience of our university life. Thank you EE for providing us with this opportunity!

Come find out more about our story from our Facebook page: https://goo.gl/hMdRvg
Canada is a beautiful place. It has fresh air, a lot of beautiful and breathtaking natural scenery giving people a sense of peace.

I studied in Acadia University for a fall semester. This University is located in Nova Scotia, which is a place that possesses 81 heritage and historical sites and with 7,600 km seacoast. You can hike on coastal trails and sometimes find whales appearing offshore.

My Pre-departure Checklist
- Check whether application for student visa is needed
- Check information of credit transfer
- Check weather and bring suitable clothes
- Buy flight ticket
- Insurance
- Check for pick-up service from the university

Just Arrived…
Though tired, I was excited on the first day. It took me around twenty hours to get to Halifax Airport from Hong Kong. There was pick-up service provided by the university from the airport. Volunteers and drivers were all nice and friendly. We talked in the car and arrived at school after an hour.

With the help of staff, I got to my living place and settled down.

Orientation
Acadia University offered a lot of orientation activities and I joined some of them. I met a lot of international students and made friends with them. These activities were very useful in helping me to get familiar with the new environment.

My Place
The accommodation there was quite nice. I lived in a double room but without a roommate. There were quite a number of vacant rooms. The room was big and warm and was furnished with heater, beds, closets, chairs and working desks. The floor was warm covered with carpet. It was very safe in my dormitory – each floor had a residence assistant and the building was well equipped with electronic security system. We entered by swiping our student ID card.

My First Class
The learning and teaching styles at Acadia University are similar to CityU. They used an online platform called Acorn for course management where students could download notes, make discussions and upload assignments. Professors are nice and welcomed questions and interactions with students during classes.

People I Met
I have made some friends with local students during classes and in some extra-curricular activities. Most of the Canadians I met are friendly and nice.

However, there was one cultural difference that really shocked me. It was their drinking and party culture – nearly 90% of students drank a lot every weekend and got “crazy”. They were literally crazy – some of them broke the wall and destroyed public facilities when they got drunk. There were cases that they needed to go to a hospital. So be mindful during weekends in such an environment and stick with friends whenever you can.

Out of Classroom
There were a lot of extra-curricular activities available for students. Acadia University has an Acadia Athletic Complex which comprises a large gymnasium, a pool, a new fitness center, a group fitness & dance studio, squash & racquetball courts, an indoor walking track, a football field alongside an outdoor walking track, and an arena. Students can enjoy those facilities. I have watched a number of football matches there and ice-skated a few times.

Moreover, apple picking is popular during fall time. The School Union also organized this activity for students.
Goodbye
I missed my new friends very much. But luckily, the provisions of various online and electronic communication channels keep people living in different corners of the world connected. Every moment with them was so treasurable. I will never forget those beautiful moments.

Home Sweet Home
I became more independent after my return. My problem solving skill has improved and I became more confident to face any challenges.

Sharing
Treasure your opportunities. If you never try, you will never know.

Overall Rating
5 out of 5

Exchange in Iowa State University, U.S.

XIE Zhiyao
BENG4-ECE, Yr 3

My Pre-departure Checklist
- Passport, visa
- US dollars or credit card, things for daily use
- Make sure you will get a place to live in when you arrive
- I especially want to mention that if you are already in USA in summer like myself, you need to exit USA and get a new visa for exchange purpose. It took me long to figure out the procedures, so I hope other students will not have similar confusion.

Just Arrived…
I missed the orientation after late arriving because of visa issues. I contacted a local Chinese student to pick me up at the airport, which may be the smallest airport I have ever seen. I was quite tired after the long journey and I really hate jet-lag! Only after check-in, I found that my roommates had switched to other bedrooms. We four students shared one apartment.

I tried to contact one of my roommates, Cooper, before the semester began. I met him later that day. He brought a bunch of guys to have a party in our apartment and got really drunk. I was a bit scared that time, but later on I got to know some of them. Then I found out two of my roommates are American and one is Chinese.

My Place
Iowa State University (ISU) is located in a small town called Ames in Iowa State, which is on the western side of Illinois State. Plenty of orderly maize fields can be observed on the way from Des Moines to Ames. The average age of the town population is 24, typical of a university town. It is a beautiful small place, I thought.

I needed to rely on Amazon a lot there because no big shopping malls can be found in Ames. Personally I was quite satisfied with the house we lived in. That seemed to be the most expensive apartment in Ames, which is quite close to main campus.

There are a lot of bus routes there, which are all free for students. By the way, the moonlight buses running at midnight were extremely useful when I needed to build my circuit in the lab till
very late. After all it looked dangerous to walk home late all alone.

My First Class
I got four days of 8am classes every week, which was a disaster for a guy loving to stay up late like me. Each session lasted only one hour in ISU except the lab sessions. My first class was about electronic circuits. The professor teaching the course was quite funny but sometimes I could not fully get his jokes because of my poor English.

One of my professors is American and two others are Korean. For the circuit design course, I needed to buy all the components required. As a result, I had to spend much time on searching for a single resistor with correct value among a bunch of components. In CityU, all the components and materials required in laboratories were provided to us and they were well-classified. Plenty of time could have been saved.

People I Met
I have three roommates there, Jiaxin, Cooper and Sid. Now I suddenly realized that it was a pity that we had not taken any photo together, otherwise I will definitely post their pictures here.

Jiaxin came from Tianxin, mainland China. It is kind of nice to have someone to talk with in Mandarin sometimes. He was a freshman, but looked quite mature already. He loved to bring a bunch of friends to our apartment to play LOL together. Unlike CityU, the hostel allows visitors to stay overnight from time to time.

Cooper is American, white and tall, blonde hair, a bit shy. He loves to bring many friends to have a party in our room, especially on Fridays. They always looked crazy after drinking.

Sid is also American, quite an outgoing guy. I had nice talks with him. He was quite interested in China and I felt good talking to him. I also met his family twice and got invited to visit their farm. They are a big family and they lived in a big farm nearby.

I met quite an excellent student called Fu Shen in one of my EE courses. He is Chinese, quite nice and he helped me a lot.

Summer and Joanne, students also from CityU, and some other students from Hong Kong traveled together with me to the east coast of America and that was a wonderful journey.

It is hard to mention all the guys, but I sincerely thank all those who offered help to me when I felt helpless in a strange country.

Out of Classroom
I guess I have eaten too much junk food like pizza and hamburgers there. They are cheap and easily available, though not quite tasty enough for me.

I found a nice but inexpensive Chinese restaurant there. I became quite familiar with the restaurant owner by the time I had to leave. Their beef noodle soup and stir-fried beef offal are simply terrific for me! And I was so sad not being able to enjoy them anymore.

During the exchange, we also visited Chicago, Boston, New York and Washington, D.C.

Goodbye
Having to say farewell is never a pleasant thing. But we all need to move forward, we all have our own goals.

Home Sweet Home
After returning to Hong Kong, I sleep much later than in America, which is not a good habit. Now, I do not need to rely on having pizza all the time, which is actually a relief for a guy not good at cooking like me. Also, I need to get used to a life without Amazon here.

Sharing
First, it is better to learn something different from your major in exchange. Second, well plan your study before you apply to avoid lagging behind your normal study plan too much after returning to CityU. Lastly, do ask a lot. We will definitely come across many questions during the exchange, so don’t be shy to ask.

Overall Rating
The exchange experience satisfied almost all of my expectations, but I wished there would have been a bigger surprise for me! So I choose to give a rating of 4 out of 5.
Exchange in University of Illinois at Urbana-Champaign, U.S.

LUO Lintong
BENG4-INFE, Yr 3

My Blog
Studying abroad is such an unique and memorable experience. As an Electronic Engineering student, studying takes up most of the time and is a major part of life. However, with several relaxing out-of-class activities such as cracking Corn Maze, my life in University of Illinois became more colorful.

My Pre-departure Checklist
Student Visa: Apply as soon as you receive the confirmation letter from the exchange university since there may be some uncertain issues for the immigration department such as system breakdown (which I encountered).

Course Registration: Do not worry too much if you have not registered all the courses you want to take as the university usually would offer higher priority to exchange students. You can do it when you get there.

Living Location: Usually you will be assigned to Undergraduate halls but you need to apply online prior to your departure. But do APPLY EARLY since the registration would be closed long before semester begins (4 months from my experience). And if you apply late, your preference would not be guaranteed.

Just Arrived…
18 August, 2015 – First Day in UIUC

So excited! Jet lag almost killed me for the first three afternoons. But I still spent my first three days on a general view trip about the school. It is a tremendously huge campus.

Ground transportation from the airport to the accommodation needs to be considered ahead. My peer exchange mates and I did not have any contacts there and no airport shuttle service was operated by the university. As we did not reserve the airport shuttle tickets early, the favorable schedule meeting our need was not available, leading to the three-hour wait at the airport for the shuttle.

Orientation
The orientation hosted by the university was warm and useful. They offered free food and most of the information we needed on arrival there. They also helped in contacting the department course leaders and solving problems about course registrations. And I met many exchange students from different countries. They were fun and very friendly.

My Place
I lived in one of the undergraduate halls and it was great!

My place of residence was a little far from campus and very quiet. The food there was said to be the BEST among other university dining halls. And there were free public buses taking students around the campus and to the classrooms. The only drawback was there was no kitchen in the hall.

I love living in the student dormitory because the students there were so funny and friendly.

My First Class
Monday, 24 August, 2015

The first lecture I attended was CS225 Data Structure. It was such a huge class with 250 students. Students were much more enthusiastic and active than CityU students. Questions never stopped. The lecture given by Dr. Heeran was so comprehensive and clear.

People I Met
I made some local friends in the same class and some at the undergraduate dormitory. In the dorm, there were some fun activities such as movie nights, ice-breaking parties for people to meet together.

What interested me most was their party culture. They held parties as often as possible to celebrate everything they liked. What’s more the parties always started midnight.

Out of Classroom
There are hundreds of clubs that you can join. Exchange students can choose whatever activities they want to participate in. However, due to time constraint, internships are mostly not
available to exchange students. My main focus was doing well in my other courses.

I also participated in many other activities organized by the university exchange engineering division, such as the Corn Maze Cracking, the Reindeer Ride, etc..

Money
Although the living expenses here are generally higher than Hong Kong, there are ways to save. If you live in apartments, you can choose to cook by yourself, which costs much less than dining in the dining halls.

Goodbye
It is always hard to be apart from a familiar environment. I really love my friends and teachers there. They encouraged and inspired me so much. Their devotion to knowledge always reminds me of the importance of learning.

Home Sweet Home
After staying in America for one semester, I found myself more determined and clear on what I want to do and what is precious in my life.

Currently the most important thing for me is studying. Knowledge is infinite and learning is a life-long road to go.

Sharing
America is a very powerful country and its universities and engineering programs are truly the best in the world. Working with all these talented people will make you aspire for your goals.

Overall Rating
DEFINITELY 5 = the most satisfied

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**Student Ambassador Scheme**

**Adventure Camp – More In-depth Understanding of “Preparation” and “Teamwork”**

LAI Wing Yan, William  
BENG4-INFE, Yr 2

I am a new Electronic Engineering Student Ambassador (EESA) this year. We had our very first training, Adventure Camp, on 20 and 21 February 2016. I was one of the team leaders and it was a valuable experience for me as a Student Ambassador.

The camp included lots of challenging tasks such as orienteering, lighting up a fire with only 3 matches and wild cooking without modern utensils, etc.. We had to prepare well before the start of the camp. We needed to study not only the topics related to the challenges set by the coach but also prepare lots of gears to ensure our personal safety. I still remembered the coach reminded us that the camp did not start at the time we gathered to head to the camp venue, but it had actually got started from the time we made all sorts of preparation. How to get the preparation work done perfectly became crucial. We may face different kinds of projects in the coming year, and prior preparation will always be the key to success.

The purposes of these tasks were not only offering an opportunity for us to live in an ancient way, but most importantly to learn the essence of teamwork. These challenges were too complicated that we could not finish them individually. We had to divide it into smaller parts and everyone was responsible for their own tasks. Finally with joint efforts the challenges were completed.
Lessons Learnt from Adventure Camp

MAK Ko Lok, MC
BENG4-ECE, Yr 2

It is a great honour for me to be an EESA. The first activity that we joined was the adventure camp. The adventure camp was an enlightening activity for me to know more about myself. The adventure camp also provided a great chance for all EESA members to know more about each other. And the most important thing is turning all EESAs into a team.

At the very beginning, we just divided the duties part by part, and then each member took one part to work on. Without sufficient communications among members, a lot of problems occurred. For example, we did not get enough “fuel” for making fire. This reminded us to develop an efficient communication system among teammates. With better communication, most of the problems had been solved and we really worked as a team at last. I learned that communication is one of the best ways to solve problems.

At night, we had to make fire for cooking. With persistence, we made fire successfully after half an hour. However, with the limited amount of “fuel” (such as branch or grass), we could not heat the food till they were cooked. I ate raw sweet potato for appeasing my hunger. I was still hungry after eating sweet potatoes. This is an unforgettable experience for me.

On the next day, we went to Pak Sha Wan T.W.C. Sea Activity Centre for dragon boat paddling. This was my first time having dragon boat paddling. Except for one EESA member, Cara, having experience of dragon boat paddling, other members have none. Since all of us had same goal, which was travelling a distance within limited time, the team spirit among EESA members started to grow. At that time, we became a team with the same goal. This was the most precious time in the whole adventure camp.

With our team spirit, I believe that we can solve most problems we are going to face in the coming future.
Interflow Tour 2016 - Singapore

FOK Chun Mun, Ken
BENG3-ECE, Yr 3

I really have a lot of words to say about the Interflow Tour 2016 organized by Electronic Engineering Student Ambassadors (EECA). The 5-day trip is one of my unforgettable experiences. This is my first time to have an opportunity to visit another country with other EECA. It is a process of learning and I am really grateful for being part of this activity — having witnessed and experienced it together with other EECA.

Through the exchange in Singapore, I gained a lot. Singapore, one of the Four Asian Tigers, is a global commercial, financial and transportation hub. Singapore’s economic environment is similar to Hong Kong. However, the Lion City is famous for its hospitality, courtesy, and strong national consciousness, which is quite different from the culture in Hong Kong. Singaporeans include Malays, Chinese and Indian, as a result, most of Singaporeans speak multiple languages, which include English, Malay, Mandarin and Tamil. Citizens of the Red Dot value their country’s image a lot and promulgate their cultural values through astonishing urban planning. You can easily find very nice architectural design for every single building in Singapore. Also, Singapore has been developed successfully and higher education plays an important role in it. They encourage creativity. Nanyang Technological University (NTU) and Singapore University of Technology and Design (SUTD) offer their students the freedom to do what they would like to with full support.

The interflow tour was finished in a cordial atmosphere. It let me feel the warmth like a family and understand Singapore more. With the support from the Department, we EECA were able to enrich ourselves through various training courses and co-organized activities. I am grateful that EE Department provided us with the valuable opportunity.

Nice Interflow Tour to Singapore

WONG Chak Ming
BENG3-INFE, Yr 3

From the EECA interflow tour, we learned a lot of things and gained valuable experiences. There are a lot of similarities between Hong Kong and Singapore such as cultures or the problems we are facing. When comparing Hong Kong with Singapore, I found that there are a lot of improvements Hong Kong could make. It is all about whether the government wants to do so.

In this tour, we visited Nanyang Technological University and Singapore University of Technology and Design. Through introductions by the local students and the teachers, laboratory visits and campus tours, we learnt more about not only the history and culture of the universities, but also the teaching and learning style in Singapore. Singaporean students are more pro-active and practical when talking about innovation. We also visited the NEWater Visitor Center to explore the new water technology and learn the way that Singapore government adopted to solve the water shortage problem. This tour is really an unforgettable experience for all EEAs.

Also, through organizing the interflow tour, I realized that good time management and planning are very important. I set the preparation work schedule rather tight that having delayed one step significantly impacted the progress of the rest.

At last, I would like to thank CityU and EE Department for providing this priceless opportunity to us to know Singapore in a relatively comprehensive way. I also want to thank all student ambassadors and Scheme Coordinator, Mr Van Ting, for working altogether to make the interflow tour come true.
Peer Tutoring Scheme

Being a Tutor is a Bliss

SINGH Keshav
BENG4-ECE, Yr 3

Being a tutor of Peer Tutoring Scheme has not only been academically enlightening to me but also personally elevating. My name is Keshav Singh, and I am majoring in ECE. I love studying this major and pursuing knowledge relating to this major has been a pure bliss to me. Upon sharing my experiences with my fellow tutees, I realized the pursuit of knowledge is even more blissful when it is shared with others.

Every now and then, within the confines of the classroom, debates about the nuances of academic technicalities ensued between me and my tutees, and that not only deepened my and my tutees’ understanding of the course materials but also made me bond with them. What started as a purely academic enterprise has now evolved into an everlasting friendship with my tutees, transcending the academic realm into leisure activities like playing badminton, going out for dinner, etc.

Although good fellowship is a great benefit of joining the excellent Peer Tutoring Scheme, something more intangible and amazing I got to learn was how to manage a group of people, having mutual respect towards everyone and how to handle dissent, which is inevitable in any group.

I would like to conclude by saying that if anyone wishes to enhance their personality and their sense of belonging to EE department, the perfect opportunity to do so is by joining Peer Tutoring Scheme, either by being a tutor or a tutee.

No Regrets to be a Peer Tutor

HSU Che Jung
BENG4-ECE, Yr 4

When I entered my final year in EE department, I felt uncertain for my future and career. I was in doubt about what I have learnt throughout these years. Thus, I was excited and directly applied to be tutor of Peer Tutoring Scheme after I received the recruitment notification. I think it would be a wonderful chance for me to look back on and have a detailed review for the past three years.

I was pleased to meet up with a group of hard-working juniors. In every tutoring session, they were well-prepared and willing to share their difficulties. Sometimes I could not answer their questions, which let me know the areas I was not familiar with. Their ideas and opinions also broadened my horizons and encouraged me to look at one thing from different perspectives. These diligent tutees somehow helped me regain the motivation to study.

If I have one more chance, I would still choose to apply to be a peer tutor. However, I would prepare more materials for each tutoring session because my experience is not enough to meet the needs of these enthusiastic juniors. Finally, I recommend every year-3 student to join the peer tutoring scheme as a tutor because you may find the reason why we took these courses and be more determined to study and take electronic engineering for our career!
Unexpected Experiences Earned from Joining Peer Tutoring Scheme

LI Jiao Da, Dalles  
BENG4-ECE, Yr 2

To be honest, I did not have much interest in this scheme at first. I did not worry about my studies, and was afraid it would consume too much time. It was the statistics comparing the academic performance of tutees and non-tutees in the previous year that persuaded me to join the scheme. After all, numbers do not lie.

However, when I really got involved, I found myself benefitting a lot from it. The tutor would draw our attention to the difficult or important part of a course, and answer our questions. Even though she might not know the answers to every question we raised, we would look into it together and finally work it out. More importantly, she had gone through what we were going through at that stage, so she reminded us of the difficulty ahead and offered us advice to help us make a wise decision about our study and career.

In addition, it was a good opportunity for us to communicate with not only the tutor, but also other tutees. We exchanged our feelings about studying and life in the university. We built up friendships through it. Besides, since we came from different countries, we could also share our experience in Hong Kong and explore one another’s culture.

In a word, EE Peer Tutoring Scheme is a beneficial scheme which offered all-round help.

Glad to be Tutees of Peer Tutoring Scheme

LAI Tsz King, Joyce  
BENG2-ECE, Yr 2

Departmental analysis showed that tutees joining Peer Tutoring Scheme were found to have higher GPA and course grades in the tutoring courses. That was the reason I joined the Peer Tutoring Scheme. Also, I hoped that I could make more friends through the Scheme.

My tutor was nice and helpful. We met together weekly and he explained some difficult concepts clearly and answered our questions patiently. Sometimes we asked for help via WhatsApp, our tutor would assist us instantly. Apart from explaining difficult concepts, he was willing to share his experience in handling midterm tests, laboratory works, examinations and so on. His sharing was really helpful for me to understand the aims and contents of the courses and complete the course assessment more easily.

I think this scheme in general is helpful and useful. It assisted tutees to handle any academic difficulties, encouraged tutees to achieve better performance, and cultivated a good relationship among EE students. My tutor introduced a challenging activity to me which enriched my horizons and experience.
Alumni’s Sharing

Mr. Kinni Mew (2012, BEngCE)
Senior Data Engineer and Co-founder, Mindlayer Limited

Mr. Kinni Mew; on the right, and his two co-founders of Mindlayer are CityU graduates

Guest: Mr Kinni Mew (K) Interviewer: Miss Idy Pang (I)

I: Thank you for accepting my invitation to share with us your latest career development. First of all, please briefly tell us your background and what you are doing.

K: I graduated in 2012 with a BEng in Computer Engineering. Mobile apps programming has been my interest since I was an undergraduate. Dr. Ray Cheung’s Apps Lab provided me with a job opportunity to indulge in mobile apps coding when I was about to graduate. As I found myself interested in sharing my programming experience with others and promoting this skill set to the community in CityU and Hong Kong is extremely meaningful as well, I chose to accept it among other 3, 4 job offers available to me at that time.

About 6 months ago through CityU and Apps Lab, my 2 partners and I, all of us are CityU graduates, were lucky enough to be selected to join a 10-day intensifying training as a team in Silicon Valley, California, which was co-organised by Stanford University and Hong Kong Cyberport. In the pitching contest after the training, our product idea was granted HK$100,000 from the Cyberport Creative Micro Fund, and so I have started my own start-up with my 2 partners since then.

K: How was your interest in coding cultivated when you were a student?

I: CityU-EE was my first choice on my JUPAS application as I was curious about both hardware and software of computer. In EE, some of the courses were mind-blowing, such as Dr. K L Chan’s course on computer vision. I knew and decided that programming would be my life-long profession and career very early. But when smart phone was getting more popular, I was fascinated by mobile apps coding, which is more applicable to daily needs and could be self-learned more easily.

Knowing our own interest and passion as early as possible will save time. My advice to current students is to know your interest before graduation. Seize opportunities to be interns, for instance, to gain knowledge of some jobs and industries, and explore what you like and dislike about them. Otherwise, it is just time-wasting to postpone your trial and error until graduation.

I: What kind of mobile apps is your team developing?

K: We aim at developing technology-driven products. Our target customers are corporate clients, and we provide a customer service platform automating instant responses to customer enquiries, such as “where is the nearest outlet?”, “how much is the share 1803?”, on WhatsApps, Facebook and WeChat, etc., while at the same time being backed up by real people monitoring. It is a kind of customer-support total solution deploying technology of artificial intelligence and opinion mining.

I: Apart from the technical skill, a must for developing any apps product, actually it is extremely difficult to think of a workable and marketable idea in the first place.

K: Yes, it’s the kind of training we engineers need nowadays. In the 10-day training offered by Stanford one of the topics was design thinking, which was about how we could verify our product ideas in terms of fulfilling customers’ needs. I am glad to know there is a course titled Product Design in our current...
EE programme, which we did not have in our days. The ability to think from the perspective of end-users helps us build and develop practical and marketable products. By the way, I felt grateful for pursuing a minor in Business Intelligence for my bachelor degree, which shed some insights on concepts of end-users and business operation.

I: Doing start-up sounds trendy and exciting, but launching and promoting your own product is never easy. I would say setting up and running a business is always complicated. How do you perceive the challenges you are facing?

K: Yes. There is a lot to learn. Cash flow, fund raising is one thing obviously. There are other issues, for example as simple as doing a product presentation. We did not have any concrete idea of what target audience meant when we were students. We engineers are trained to be proficient in communicating in our technical language; however, presenting your ideas in technical language to non-engineers will be disastrous. How to tune your tone and make a successful pitch to your potential clients in return for their trust in you and your product, and most importantly, a cheque is something basic yet critical. Besides, how to work in a team of three in a way that utilizes, synergizes or even maximizes each of our potential is another example.

My strategy is to do our best while planning for the worst. One of the speakers in Stanford shared with us that we cannot predict the future; there are times we must trust our gut feeling. Not everything is right, but we make it right. After all, it is the passion inside you. I am lucky that I am doing something that I like.

I: It is very true. We play our part and make things right. What other advice do you have for our fellow students?

K: Other than knowing your interest and career direction before graduation, it may sound boring I know, being physically present in class is important. Believe it or not, you will not know how helpful these fundamental training, those stuff you see as boring and useless sometimes are, but you will find their value in the future. The concept, or even just some keywords, being introduced by professors may be your life-saving jackets one day when there is no one else you could ask for help in the future. It is not the right time for you to judge what is useful or useless at this stage. I may put it this way, how could you do googling and self-learning if you cannot think of the relevant keywords? Besides, soft skills, people networking, and your attitudes in life will be a great influence to you too.

I: I can’t agree more. Thank you so much today. I wish your business will be growing and flourishing.
***** Mathematical Amusement (No. 32) *****

\[2016 = 2^5 + 2^6 + 2^7 + 2^8 + 2^9 + 2^{10}\]

\[= 3 \times 3^3 \times 3^3 - (3 \times 3^3 + 3 \times 3^3 + 3 \times 3)\]

\[= (4 + 4) \times (4^4 - 4)\]

\[= 5 + \frac{(5 + 5) \times 55}{5}\]

\[= 666 + 666 + 666 + 6 + 6 + 6\]

\[= 7 + 7 \times (7 \times (7 \times 7 - 7) - 7)\]

\[= 888 + 88 + 88 + 8 + 8 + 8 + 8 + 8 + 8 + 8\]

\[= 999 + 999 + 9 + 9\]

\[y = \frac{\ln(2016)}{\ln(a)} \Rightarrow \ln(a) = \frac{\ln(2016)}{\ln(H)}\]

\[\Rightarrow \quad a = \left(\frac{2016}{H}\right)^{\frac{1}{\ln(H)}} \Rightarrow \quad a^{\frac{1}{\ln(H)}} = \frac{2016}{H}\]

So

\[Ha^{\frac{1}{\ln(H)}} = 2016 \quad \Rightarrow \quad Ha^{\frac{1}{\ln(H)}} = 2016\]