ENGAGE 程繫中大

START-UP COMPANY

Being good at math and science, and innovation, engineering students have abundant job opportunities after graduation. Besides working as professional engineers, quite a number of our students and alumni established their own companies. This issue of Engage invited a student and some alumni to share their experience in establishing their startups.

EE — Electronic Engineering

Martin Tsang

2005 BEng (Electronic Engineering) graduate
Founder & Executive Director of AMOS Enterprises Limited and Hong Kong EV Power Limited

When I was at university, I wasn't interested in what I studied until I took a one-year internship at Motorola, where I learnt a lot of real-world practices related to my studies and became fond of electronic engineering.

I developed my final year project, which brought me a lot of awards and praises, with the knowledge I gained during my internship and skills learnt at school. Even though many people encouraged me to start a company based on my project, I knew I couldn't run a company without any relevant experience. That's why I chose to enter a small company to learn how to run a business first after graduation.

One year afterwards, I started my company on electric vehicle charging system with my partner, Lawrence Chan. Back then, there were only two of us and we were not sure whether we could make profit because the market of electric vehicle charging system was very new. But I held my belief that our business could survive and grow because there were no big competitors and electric vehicles were becoming more popular. We have built 150 charging stations in Hong Kong since 2010, covering all the Hong Kong government public car parks, corporates, residential buildings and shopping malls such as IFC, Elements, Hopewell Centre, etc.

To facilitate the implementation of the new energy vehicle development policy of the Chinese Government, we have also expanded our business to Beijing, Shanghai, Guangzhou, Shenzhen and Macau. We will accelerate our expansion to other mainland cities to meet their vehicle charging need. We aim to build the most comprehensive charging network in the greater China.

CSE — Computer Science and Engineering

Tsang Ka Chun, Tab

Year 2 Computer Science Student
CEO & Game Producer of C4Cat Entertainment Limited

Game making is an interesting topic for many CSE students. It has interested me since my graduation from secondary school when I formed a doujin group with friends and started making games. It was just a hobby at the beginning because it was hard to publish and retail indie pc games at that time. Our group has gained awards in some game competitions, e.g. the game Shadow of Life was the best 6 of GDC China 2014 (Student). I came up with the idea to turn my hobby into a start-up when I saw the opportunities offered by mobile phones. We turned the doujin group into a start-up game company, C4Cat Entertainment Limited, in Oct 2014.

C4Cat makes and publishes gamers mobile games. Our first published product is the hardcore mobile rhythm game, Dynamix, launched on Google Play Store on 30 Oct 2014. It ranked second in a music game list for a week and it has now accumulated over 100K downloads.

As a student and a startup owner, the greatest challenge is to balance the start-up business and my study. It is like taking two full-time jobs, which means working for 24 hours a day and 7 days a week, but I enjoy it a lot.

START-UP COMPANY

IE
Information Engineering

Albert Au Yeung
2012 BEng (Information Engineering) graduate
Axon Labs Limited

(From left) Albert Au Yeung and Joey Cham, Co-founders of Axon Labs

After working as a researcher for several years, I started a technology company, Axon Labs Limited, with my partner Joey Cham in early 2014. Axon is the part of a neuron that transmits information to other neurons, and thus is an excellent representation of what we want to do: to process data and transform it into valuable information to people, using our experience in mobile app development, cloud computing and data mining technologies.

We started developing mobile apps in 2011. Our first product, "Taaaste", recommends nearby delivery services to HK users. After its successful launch in Apple's app store, we were invited by Samsung Electronics Ltd. to develop an Android version. We have also developed a very popular public information app called HKBus+ (香港巴士通), which has been downloaded over 450,000 times and received an award in the Public Sector Information Application Competition organized by the HKSAR government in 2014.

Our company has just been admitted to Hong Kong Science Park's Incu-App Incubation Programme (網動科技創業培育計劃), and will move into the Science Park in early January, 2015. Running our own business is fun and rewarding but we are aware of the challenge to balance among pursuing technological innovations, satisfying user/market needs and identifying a sustainable business model. In the coming year, we hope to identify projects that would satisfy all these requirements, and then turn these ideas into useful products to benefit more and more users.

MAE
Mechanical and Automation Engineering

Won the Gold Medal in the 42nd International Exhibition of Geneva in 2004.

Wong Chi Yin Joe
2004 BEng (ACAE) graduate
Chief Executive Officer, Medisen Limited, Hong Kong

I am really happy to have this opportunity to share my experience here. I studied in Automation and Computer-Aided Engineering, which is Mechanical and Automation Engineering now and I graduated in 2004. After my graduation, I worked in a startup company called Sengital Limited. Dr. Alan Lam, the founder of Sengital, was the tutor of my FYP project and I worked with him for 9 years (from 2004-2013). With his support in 2013, I started up my current company, Medisen Limited which focuses on Medical and Healthcare product. Starting a business is not always easy and I have faced a lot of challenges since then. I feel lost and frustrated sometimes, but I overcome the difficulties by determination and innovation. If you would like to gain more experience and really want to do something that you believe, do not hesitate and let's start-up your own business now!

SEEM
Systems Engineering and Engineering Management

Di Wu
2010 PhD (Systems Engineering and Engineering Management) graduate
Co-founder, Financial Engineering and Technology Corporation

If there was a kind of software stocks through which you were definitely able to gain profit, would you believe it? Dr. Di Wu developed a so called "wise investment strategy" stock analysis tool successfully two years after his graduation. Making use of the data and technology trend in the last decade and meanwhile considering the risk preference of users, this kind of stock analysis tool can provide wise trading strategies to users after computer operating. Users only need to click a few times a day online with the recommendation of systems, and the annual return will certainly reach to the range of 20% to 40%. Furthermore, Dr.Di Wu found a financial technology firm, named Financial Engineering and Technology Corporation (FETC), with a group of Ph.D. graduates from SEEM Department of CUHK and angel investors from Massachusetts Institute of Technology (MIT). FETC is a fast-growing financial technology firm providing financial engineering services to corporate clients and individual investors in Hong Kong. With an intensive research background in financial engineering and system trading, they specialize in developing financial models, trading strategies, algorithmic trading solutions, and other trading technologies. By providing state-of-the-arts technology and innovative solutions, they aim to make systematic and quantitative investment accessible to everyone in the world. Headquartered in Hong Kong, the company is growing rapidly with the development of financial markets in Greater China Region. Throughout the years, FETC gained a series of recognition from business and research areas such as Innovation and Technology Fund of the Government of HKSAR and the top 20 hottest start-ups by HONG KONG BUSINESS in 2013.

NEWS UPDATE

Novel Face Recognition System

Prof. Xiaoou Tang, Department of Information Engineering, and Prof. Xiaogang Wang, Department of Electronic Engineering, have built a novel facial recognition system that has the highest accuracy in the world. While human beings generally recognize faces with an accuracy rating of 97.53% on Labeled Faces in the Wild, a database of face photographs designed for studying the problem of unconstrained face recognition, the CUHK-developed system is observed to recognize faces with an accuracy of 99.15%, regardless of changes in lighting make-up and camera angles.

Research Excellence

The paper "Optimal Spectrum Sharing in MIMO Cognitive Radio Networks via Semidefinite Programming", coauthored by Prof. Angela Yingjun Zhang (Department of Information Engineering) and Prof. Anthony Man-Cho So (Department of Systems Engineering and Engineering Management), has won the 2014 IEEE Communications Society (ComSoc) Asia-Pacific Outstanding Award. This is the third year the IEEE ComSoc Asia-Pacific Board offers this prestigious award to honour outstanding original papers authored by members in the Asia-Pacific Region and published in IEEE ComSoc journals in the previous three years.

The paper was published in IEEE Journal on Selected Areas in Communications, Cognitive Radio Series in Feb 2011, and has stimulated considerable follow-up work since then. The paper proposes a unified and tractable framework to address the problem of the interference management in MIMO cognitive radio networks, where secondary users do not always know the channel information to the primary user receivers. The work is significant in two ways. Firstly, it is the first to construct a unified homogeneous quadratically constrained quadratic programming (QCQP) formulation that applies to various scenarios with different levels of secondary user channel information and with either deterministic or probabilistic interference temperature constraints. Secondly, built on the recent advances in low-rank semi-definite programming, the paper developed efficient solution algorithms to compute the optimal transmitter-side beamforming vector in polynomial time.

20th Anniversary of Mechanical and Automation Engineering Department

The Department of Mechanical and Automation Engineering celebrated its 20th anniversary recently. Over 130 guests including alumni from business, industrial and education sectors participated in the Celebration Ceremony. Certificates of appreciation were presented to current and former Advisory Committee members for their dedicated service to the Department, and to scholarship sponsors for their generous contribution. Six MAE staff received the 2014 Long Service Awards for having worked at the Department for 20 years.

To mark the 20th anniversary of the Department, 20 outstanding alumni have been selected by the Department in 2014. One of the outstanding alumni, Prof. Tak-Sing Wong, has recently been selected as one of the world's top 35 innovators under 35 by MIT Technology Review in recognition of his achievement in inventing one of today's most intriguing and potentially useful new materials.

Prof. Tak-Sing Wong, The Pennsylvania State University

For details of the 20 outstanding alumni, please refer to the website of MAE 20th anniversary: http://www.mae.cuhk.edu.hk/20thanniversary.php.

Group Photo of Alumni with MAE Staff and Guests

Cake Cutting Ceremony by (from left): Prof. Y. Yam (Third Dept Chair), Mr. S. H. Chan, JP (Chairman of the Advisory Committee on MAE), Prof. C. P. Wong (Faculty Dean of Engineering), Prof. Benjamin W. Wah (Provost), Prof. J. Huang (MAE Dept Chair), Prof. C. P. Kwong (Founding Dept Chair) and Prof. Ronald Chung (Fourth Dept Chair)

New Business Model to Make Broadband Wireless Service Economical

The Network Communications and Economics Lab (NCEL) led by Prof. Jianwei Huang, Department of Information Engineering, has recently proposed a novel information market model for TV white space networks. The research team demonstrated that such a model could bring a significant profit to the white space database operator, while guaranteeing mobile users' free unlicensed spectrum access mandated by the government regulators. Prof. Huang's research team has been studying the economics of TV white space ecosystem for several years, and this work won the Best Paper Award in IEEE WiOpt 2014, a single-track leading wireless conference focusing on modeling and optimization of wireless networks.
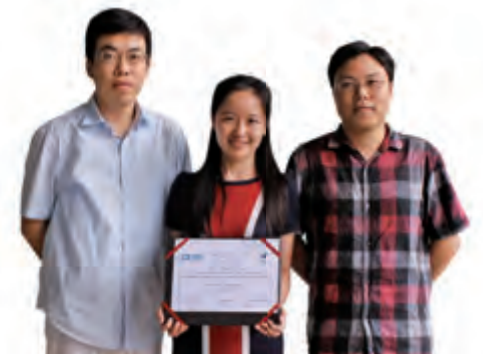
(From left) The information market model for TV white space networks proposed by Prof. Jianwei Huang, Ms. Yuan Luo, PhD student, and Dr. Lin Gao, Postdoc Research Fellow won the Best Paper Award in IEEE WiOpt 2014.

Innovative Tree Guard Monitoring System

Prof. Chiu Siu Wai, School of Life Sciences and Prof. Cheng Chun Hung, Department of Systems Engineering and Engineering Management, have jointly developed an innovative Tree Guard Monitoring System, with sponsorship from the Chung Chi College. The automatic monitoring system allows round-the-clock surveillance against possible tree theft, as well as risk of collapse for tilting and sick trees. The system can be adopted by country parks, property managements as well as garden managements.

In Hong Kong, thefts of Incense Trees, as well as the Buddhist Pine, is on the increase. The incidents have prompted Prof. Chiu Siu Wai and Prof. Cheng Chun Hung, with a team of CUHK students and staff to develop the novel 'Tree Guard Monitoring System' to protect the plants, as well as to monitor the collapse risk of hazardous trees. The system consists of multiple sensors, such as sonic, temperature, humidity and tilt sensors, which are integrated into a hardware device with wireless communication capabilities for continuous monitoring. When the device is mounted on the tree, alerts will be sent to the control room when abnormal activities on the trees, such as sawing and hammering are identified. The same principles can be applied to monitoring tilting and sick trees.

Albeit the difficulty, the research team still deemed it worthwhile to develop the system for protecting the trees and people's lives. CUHK has been actively undertaking tree management research and offering recommendations to the authorities. In October 2010, Prof. Chiu Siu Wai urged the government to formulate a sustainable tree strategy and establish a tree health database in Hong Kong to improve the effectiveness of tree management. She has developed two novel tree management skills, which can help prevent trees from dying due to pest infestations, prevent Incense trees from producing resin, as well as detect hidden tree diseases and structural defects at an early stage.

iScope

The iScope team consisting of doctoral students (Jiyi Cheng, Dapeng Zhang) from the Department of Mechanical and Automation Engineering developed a new multi-modal high-speed microscope system for volumetric imaging. The system enables various real-time biological studies that cannot be realized in the past. The commercial and scientific value of this technology was recognized by the Selection Committee of CUHK Pre-Incubation (Pi) Center, and the iScope team was awarded Winner of CUHK Pre-Incubation Centre (Pi Centre) Competition. The award not only allows the team to access various resources offered by Pi Center, but also helps iScope team to connect with angel investors and entrepreneurs for forming a successful business. It is very helpful to learn from experts in Pi Center and build up the professional network through the program.

(From left) Mr. Jiyi Cheng and iScope's supervisors Prof. Yam Yeung and Prof. Shih-Chi Chen

Mr. Jiyi Cheng and Mr. Dapeng Zhang

Multi-modal high-speed microscope system for volumetric imaging

EE PhD Graduate won the 2014 HKIS Young Scientist Award

Dr. Ke Xu, supervised by Prof. Hon Ki Tsang, won the 2014 Hong Kong Institution of Science (HKIS) Young Scientist Award in the category of Engineering Science and received the top prize of HK$10,000. The HKIS annual conference was held at the Hong Kong University of Science and Technology on 8 Nov 2014.

Visually-impaired Positioning System

(From left) Chan Chun Kit, Yung Man Lee , Chan Chuen Wai, Keung Nga Fong

Yung Man Lee, Chan Chun Kit, Keung Nga Fong and Chan Chuen Wai won the champion of the HKIE Joint Institutes Competition 2014. The project named "Visually-impaired Positioning System" (VPS) is a new guiding system to facilitate the visually-impaired to go out in a safer way and explore a new place independently with a special designed guide stick. They also won the "My Favourite Project" Award.

VPS can provide a real-time guide to the visually-impaired for them to go to their destination and explore new places. At each turning point of the guiding tiles, VPS can give directions to the destination. By obtaining an actual position of the user, VPS can also act as an emergency contact device to ensure the safety of the user.

Undergraduate Summer Research Internship 2014

The Faculty has launched the Undergraduate Summer Research Internship programme to support its students to undertake a research project under the supervision of professors in summer. This programme gives students exposure to research environment, and grooms them for graduate studies and overseas summer research schemes.

A student of Information Engineering, Liang Jiaxin has won the best project award with his design of SNSApp.

### Description of SNSApp – App for Cross-Platform Socialization

With the popularity of online social network, many of us need to handle more than one type of Social network accounts, e.g. Facebook, Twitter, etc. SNSApp is an application focusing on helping people manages multiple accounts on the same or different platforms, based on an open source project called PIXS. PIXS, Programmable Intelligence for Cross-Platform Socialization, is one kind of technology that can rank the messages with different types of coming from different sources of SNS. With the proliferation of smart phone and the help of PIXS, SNSApp is implemented to collect and analyze users' reading habits when they are using the app to interact with the social network. The way SNSApp to "learn" users' habit cleverly is that, it will not only ask the user to rank messages directly, but also silently recording the location, time, information channel, and other related factors under users' permission. After collecting these personal reading data, SNSApp will use some artificial intelligent method to make itself cleverer and know the user better. In result, SNSApp can gradually be a smart secretary for the user, which always shows users the best-interest-matched messages. Gradually, SNSApp can help users to save lots of time scrolling down the screen, aimlessly finding the information that catches their eyes.
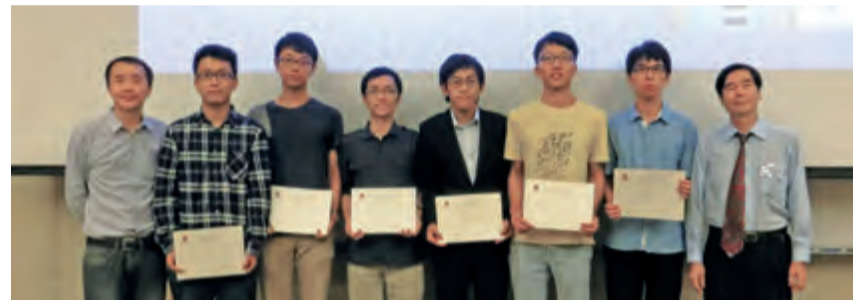
(From left 2) The recipients of best project awards include Zhang Qiming, Zhang Qiaosheng, Liang Jiaxin, Huang Jian, Li Linkai, Wong Yau Chun

Participants with Professor Michael Cheng
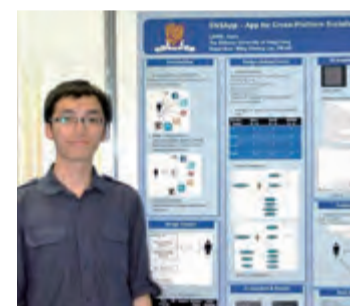
Liang Jiaxin, the designer of SNSApp

Innovation and Technology Student Club

Our guest Billy from HASEL sharing about his flight related achievements

Learning Writing Apps Tutorial in CUHK computer Lab.

Members are preparing their flying competition

With a view to preparing Hong Kong for upcoming challenges and to developing it into a knowledge-based economy, the Faculty of Engineering, The Chinese University of Hong Kong, has set up an "Innovation and Technology Student Club" (ITSC) jointly with Innovation and Technology Commission (ITC). Our vision is to nurture young talents to become future technology elites who will contribute to the development of Hong Kong. Since May 2009, we have recruited over 1300 secondary school members with similar interests in science and engineering.

During 2014 Christmas on 22-24 Dec., we have organized our first winter camp in Sai Kung (HKFYG Jockey Club Sai Kung Outdoor Training Camp) with the theme: "Soft" "Hard" Engineering. With participation of over 37 students from 26 schools, we learned 2 different fields of engineering. "Soft" is learn how to write current trendy technology – game apps, we have a 6 hours tutorial in CUHK computer lab. Some of our members achieved their lifetime 1st game apps which is very unique to them. For "Hard" part, we have flying flight competition in the camp, members need to learn how to fly a flight simulator first. They need to produce their flight with help from our committee (who prepared this before) and our engineer with flight expertise: "Siu Ming" from Department of Mechanical and Automation Engineering, CUHK. Participants in groups of 6 are required to fly their own flight with missions set by committee. Although time is too rushed that no single group finish all missions of the game, it is full of fun when we see the flight can work.

At last part, we concluded our camp with a Christmas party. Our Santa Claus "Prof. Wong Kam-fai" bought us Christmas gifts and all members prepared their gift for exchange as well, the gift they prepared must be related to "air". They were showing their creativity through this part and all kept a memorable moment on this Christmas Eve morning.

ITSC is planning all various activities like Technology reporter, research internship, technology ambassador, summer camp, workshops for coming March and summer. You may view more of our activities in our website, facebook and youtube channel as below: www.itsc.org.hk, www.facebook.com/ITSC.HK and www.youtube.com/CUHKcintec.

If you are secondary students, you are welcome to join our activity by applying membership thru http://www.itsc.org.hk/chi/membership.html online. Joining memberships and most activities are all free of charge.