Knowledge Transfer Annual Report 2017/18

Submitted to

University Grants Committee

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The Hong Kong University of Science and Technology
Clear Water Bay, Kowloon, Hong Kong

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HKUST has been working diligently in Knowledge Transfer (KT) in the year of 2017-18 according to the strategic goals:

- Strengthen the leadership and governance of KT endeavors at HKUST
- Foster an inspiring, engaging and vibrant entrepreneurial environment at HKUST
- Active outreach to the society and industry
- Contribute to the building of entrepreneurship eco-system in Hong Kong
- To strengthen knowledge dissemination and enhance the effectiveness of KT operation
- Strengthening the manpower support on commercialization

This report provides a summary of the KT-related activities and achievements for 2017-18.

1. Enhancing Knowledge Transfer Supporting Infrastructure

Fostering the Culture of Research Excellence

Far from one to rest on its laurels, HKUST continued to push hard to explore research opportunities in the year 2017/18. The University received over HK$189 million in 130 collaborative research projects. HKUST researchers once again successfully proposed a number of multimillion-dollar group projects to funding agencies locally in Hong Kong and beyond. Selected projects are highlighted below.

Theme-based Research Scheme Project: The HKUST-led project focused on energy storage was awarded HK$50 million. The research team, led by Professor Tianshou Zhao from the School of Engineering (SENG), in addition to 4 local universities as well as 3 North American institutions, proposes to develop a novel energy storage system that incorporates electrically rechargeable liquid fuels known as e-fuels. The e-fuel storage technology offers an excellent solution not only for grid-scale energy storage, but also for off-grid and distributed energy system power supplies.

Collaborative Research Fund Projects: HKUST researchers continues to secure significant research funding from the Collaborative Research Fund (CRF) of the Research Grants Council. During the reporting period, 4 Group Research Grants and 2 Equipment Grants were awarded to HKUST, with a total funding of HK$36.6 million in aggregate. The funding enables HKUST to form a world-leading centrifuge cluster in hazard prevention, offshore resource engineering, and environmental protection, as well as enabling atomic scale characterizations for two-dimensional materials. The Group Research Grants will enable research in immune cells, neurohistology, quantum physics and Aggregation-Induced Emission (AIE) systems.

Applied Research Projects Supported by the Innovation and Technology Commission (ITC): HKUST takes pride in working closely with companies in collaborations of industry-relevant research and development (R&D) projects. 36 of our applied research projects began implementation during the reporting year with the total amount of HK$116 million from ITC. Professor Bertram Shi from the Department of Electronic & Computer Engineering (ECE) was granted a project with funding of HK$9.12 million for his proposed research on the anticipatory control of exoskeletons using multi-modal human-machine interfaces. The HKUST-MIT Research Alliance Consortium successfully secured 2 projects with funding of just over HK$10 million each in the development of prehensile dexterity for autonomous robots as well as networked control systems for Internet-of-things (IoT) devices in the other.

"HKUST Project" from the Guangzhou Science and Technology Innovation Committee (GZSTI): The International Cooperation Science and Technology Program ("HKUST Project") was established by the GZSTI in 2012. The Program aims to provide research funding to support joint research conducted by Guangzhou enterprises together with HKUST or Guangzhou HKUST Fok Ying Tung Research Institute (FYTRI) in Nansha. For the year 2017-18, total research funding of RMB 13.7 million was granted to 21 collaborative projects with HKUST, bringing the total collaborative projects with HKUST to 71 for cumulative research funding of RMB 46.18 million since the inception of the Program.

Promoting Theme-Based Interdisciplinary Research – Establishment of the GREAT Smart Cities Center

HKUST provides strong infrastructural support to foster frontier research and innovation. The institutes and research centers at HKUST create an interdisciplinary environment, helping to generate fresh ideas and allowing these ideas to be tested and realized with collaboration of industry partners. Following prior success in the Robotics Institute (RI) in 2015 and the Big Data Institute (BDI) in 2016, the GREAT Smart Cities Center was established at HKUST in 2018, with focus on advancing 5 GREAT attributes of smart cities development, namely Green, Resilient, Empowering, Adaptable, and Transformative. The goal of the center is to make HKUST a global center of excellence for GREAT Smart Cities research and education, by establishing a university-based platform to develop research capabilities, educate professionals, and interface and work closely with governments, both locally and those in the Greater Bay area, relevant industries and NGOs for smart cities development.

HKUST Nanhai Joint Innovation Center

The HKUST LED-FPD Technology R&D Center at Foshan was jointly established by HKUST and the Nanhai District Government in Foshan in 2012 for technology development and transfer of HKUST's Light-Emitting Diode (LED) and the Flat-Panel Display (FPD) to industry partners in Nanhai and neighboring areas. Since its inception, the R&D Center provided high-quality research and testing services to over 300 domestic and international enterprises. To reinforce the collaboration, HKUST and the Nanhai Government established the HKUST Nanhai Joint Innovation Center in March 2018. Under the agreement, the Nanhai Government will commit a total of RMB 48 million for the establishment of the Joint Innovation Center and funding for R&D, in addition to technology transfer. Of which, a funding of RMB 30 million was provided for the establishment of a special fund for R&D cooperation of HKUST and enterprises in Nanhai District in areas including Optoelectronic Semiconductor, IoT, Advanced Manufacturing and Automation, Advanced Materials, as well as Green Buildings and the Environment.

Revision of Guideline for HKUST Entrepreneurship Program and Renovation of Incubator Space

HKUST Entrepreneurship Program (EP) has been in operation since 1999 to assist faculty members, alumni and students in the establishment of technology-based start-ups, and has helped the formation of 60 technology start-ups in the Clear Water Bay campus. In line with the new development of EP in areas such as joint-incubation programs (e.g. with Hong Kong Science and Technology Parks Corporation (HKSTP) since 2017) and facilitate its further expansion, a new set of operational guideline has been developed and approved by University management, addressing areas such as admission criteria, incubation period and arrangement on company shares for EP admission. In addition, the incubating space at the Clear Water Bay campus has been undergoing renovation and will be completed in Fall 2018. The number of companies that can be incubated in the new space will be increased, with the goal to provide a more vibrant entrepreneurship environment on campus.

HKUST Innovation Building

As HKUST commands a unique position in establishing a stronghold to contribute to the innovation and entrepreneurship development locally and in the region to make societal impact, an Innovation Building (IB) has been planned on the campus. HKUST received HK$150 million donation from Mr. Martin Ka Shing Lee for the establishment of IB in 2016. The IB provides space and support for faculty and students on innovative research, entrepreneurship, and supporting facilities of open and collaborative nature, integrating the campus-wide capacity in IB or elsewhere. The building is set to have a construction floor area of about 10,000 square meters and to be completed in 2021.

HKUST Knowledge Dissemination Channels – Case Collection

To facilitate knowledge dissemination and strengthen research culture excellence of HKUST, the University has a Knowledge Transfer Hub (KT Hub) to link up all KT units. Also the Scholarly Publications Database (SPD) and the DataSpace@HKUST provide platforms for HKUST researchers to showcase their research outputs and manage their research data. In addition, the HKUST case collection is available on the web (http://www.bm.ust.hk/cbcs/collection_new.html). The webpage highlights abstract and learning objectives of each business case published, and are open for the public

HKUST Case Collection

educators' request on a complimentary basis. The case library serves as a rich source of teaching materials developed by HKUST faculty, through which the use of the case, its teaching note and the supplementary materials could be shared with interested institutions or organization on request. Last year, over 20 programs (about 2,000 copies) from HKUST and international universities and institutions around the world have requested HKUST cases.

SUPERCOMPUTING SERVICE PLATFORM

The Supercomputing Service Platform enables access to National Supercomputer Center in Guangzhou. FYTRI has been designated by the National Supercomputer Centre Guangzhou (NSCC-GZ) of Sun Yat-sen University (SYSU) as the contact window for Tianhe-2 users from universities, government, NGOs and commercial sectors in Hong Kong. The Tianhe-2 Supercomputer is currently the fourth out of the Top 500 Supercomputer list published in June 2018. Over 160 research teams have signed up as users. The user base of FYTRI's Supercomputer Service Platform has increased fourfold between October 2017 and June 2018, with users not only from HKUST but also from other institutions, including Hong Kong Polytechnic University (PolyU), Hong Kong Baptist University (HKBU), City University of Hong Kong (CityU) and HKSTP.

Supercomputing Promotion Seminar at Hong Kong Science Park

JOINT SCHOOL OF MICROELECTRONICS IN SHENZHEN

HKUST signed a framework agreement with the Southern University of Science and Technology (SUSTech) in Shenzhen for the establishment of SUSTech-HKUST Joint School of Microelectronics, with the support of the Shenzhen Municipal Government. The proposed Joint School is set to become a multilateral collaborative platform for industry, academia and research at the national level, facilitating both nurturing of market-desired high-caliber talents and innovative research in key strategic areas including integrated circuit (IC), system-on-chip design for communications, artificial intelligence (AI) and robotics, as well as next generation microelectronics device technology such as wide bandgap semiconductors.

2. UNDERTAKING TECHNOLOGY TRANSFER ENDEAVORS

INVENTION DISCLOSURE AND INTELLECTUAL PROPERTY PROTECTION

HKUST is a strong believer of a comprehensive and robust Intellectual Property (IP) portfolio to be critical to fulfill the University's KT Missions. For the past year, 153 inventions were disclosed to both the Clear Water Bay and Mainland Platforms at HKUST, and 244 new patent applications have been filed. With 143 newly granted patents for the past year, the actual number of active patents and patent applications contained within HKUST's current IP portfolio is 1,390.

IP Seminars: 4 seminars were organized in partnership with prominent IP practitioners and renowned IP firms to the University community to equip researchers with essential IP knowledge and skills. The flagship event was the visit of Sir Robin Jacob, former judge in the Court of Appeal of England and Wales, who has been practicing IP Laws for over 50 years. Sir Jacob decoded the complex patent system and shared his insights on how to best use the patent system to support innovation. The other seminars covered hot topics on general knowledge of IP and basic filing strategies, smart tips and insights on US patent prosecution practice, and challenges and tips for patenting FinTech, IoT and Blockchain inventions. The seminars drew an audience of over 400, including not only HKUST members as well as HKUST alumni, but also business leaders, veteran IP practitioners and government officials from over 30 organizations.

The Rt. Hon. Professor Sir Robin Jacob shared his insights on how to best use the patent system to support innovation.

CONTRACT RESEARCH, CONSULTANCY & TESTING SERVICES

Through the University's business arm, HKUST R and D Corporation (RDC), HKUST enters into partnership with the private sector in a wide spectrum of technological areas. In 2017-18, RDC has served 188 contract research cases worth a combined funding amount of HK$72 million. In addition, there were 11 consultancy projects carried out by our researchers that counts HK$2.4 million. 333 equipment and facilities service agreements have been made with companies in Hong Kong and elsewhere by making use of the University's major equipment and facilities, bringing an additional cash receipt of HK$2.5 million. The total income generated through contract research, consultancy and testing services, including those from the Mainland Platforms, reached HK$96.5 million for the past year.

Licensing and Relevant Activity

HKUST has been exploring channels and opportunities for IP licensing to industry. For the reporting period, RDC is managing a total of 103 active patent and software licensing agreements, with an additional 4 active licenses managed by the Mainland Platforms. The total cash receipt generated through technology licensing by RDC in the reporting year was HK$4.4 million. Together with the licensing income generated from Massive Open Online Courses (MOOC), the overall licensing income in 2017-18 was HK$6.7 million.

3. Bridging the Development Gap and Strengthening the KT Value-Chain

In addition to enhance the culture of research excellence, HKUST is also determined to foster an innovation and entrepreneurship ecosystem, and has been working diligently in designing and providing gap funding support to encourage technology commercialization and start-up formation.

Proof-of-Concept Fund (PCF)

During 2017-18, 14 PCF applications were received, of which 9 projects were recommended by the PCF Vetting Committee comprised of industrial experts and VCs for a total funding of HK$1.6 million. A list of approved PCF projects can be found in Appendix B. We continue to see promising outcomes resulting from the PCF Program, with funding enabling research teams to develop prototype for their background technologies, resulting in collaborations and licensing opportunities.

HKUST U*STAR Program (U*Star Program)

U*STAR Program was established to serve as another channel of gap funding support at HKUST with a focus on assisting students to develop business propositions based on selected technologies. Since its inception in 2016-17, 27 applications were received with students from more than 10 different departments and programs. 16 teams received the award of HK$40,000 each. A pre-incubation training program co-organized by HKSTP on development of teams' abilities to build business model and raise fund from investors was arranged for the awardee teams last summer, and an upcoming training program will be providing to the new awardee teams this summer. We are encouraged to report that companies formed by the 2 best teams from the 2016-17 U*STAR Program were nominated to participate in the final panel interview for the TSSSU Program and both companies secured funding support from the Program. A list of approved projects of the U*STAR Program can be found in Appendix C.

HKUST Dream Builder Funds

Aiming to support HKUST full time students for their early stage innovative ideas and start-ups activities, 2 entrepreneurship funds, namely Yeung Wing Yee Entrepreneurs Fund (YWYEF) and HKUST Entrepreneurship Acceleration Fund (EAF), were established by the Entrepreneurship Center (EC). Together with the Alumni Endowment Fund (AEF) Student Start-up Grants set up by the Development and Alumni Office (DAO), students can set off their dreams while receiving guidance and encouragement from HKUST. In 2017-18, around HK$1 million has been committed to 38 innovative projects supported by the EAF, 13 HKUST start-ups supported by YWYEF as well as 8 projects supported by AEF Student Start-up Grants. (Refer to Appendices D, E & I).

HKUST Entrepreneurship Fund

Aligning with HKUST KT Mission and with a view to strengthening the promotion of entrepreneurial spirit among HKUST stakeholders leading to social and economic impact, HKUST Entrepreneurship Fund will be established for the benefit of promising HKUST technology start-ups. The Fund is intended to be a capital investment solely for HKUST start-ups, to help bridge the funding gap of HKUST start-ups before they could secure sufficient external funding to grow or to expand. HKUST is currently working on the detailed operational plan and procedure of the HKUST Entrepreneurship Fund with the intention of the Fund to be operational in the year 2018-19.

HKUST Sustainable Smart Campus Initiative

HKUST is committed to creating a more vibrant, inclusive, and sustainable campus to support the University's educational goals and priorities. The University is determined to become a global leader in sustainability education by transforming the Clear Water Bay campus into net-positive environmental impact living laboratory for experiential learning, demonstrating cutting-edge research and sustainable operations within a vibrant and engaged community. With the HKUST Sustainable Smart Campus Initiative, HKUST will support campus projects that demonstrate technologies, concepts, or redesign of spaces in ways that create a cutting-edge showcase for innovation and sustainable action on campus. The "Campus as a Living Lab" concept will enable the campus to be the testbed for demonstrations of new technologies from HKUST and beyond, enabling teaching, research and operations seamlessly integrated.

4. Nurturing Entrepreneurial Culture

In creating an entrepreneurial ecosystem on campus, HKUST has put emphasis on entrepreneurship education to the campus community. The Entrepreneurship Center (EC) works with academic units to set up credit-bearing courses on entrepreneurship. Seminars, workshops and training programs are also organized to provide learning experience to the campus community. EC also organize prominent competitions in the community, including hackathons and entrepreneurship competitions, to provide platforms for young and enthusiastic entrepreneurs to try out their startup ideas.

Leapfrog

This is a new initiative to provide opportunities for students to interact with foreign students and entrepreneurs. HKUST has been working with Co-Working Spaces and foreign universities for these Experiential Learning Tour. A Learning Tour was organized in January 2018 to Seoul to study E-Commerce business operation and start-up ecosystem in Seoul. Another Exchange Learning Program to Sydney was arranged in July 2018. In addition, HKUST had organized student delegations to join the Fudan University Bauhinia Valley Program in December 2017 and May 2018. Over 40 students in total participated in the Leapfrog Program during the reporting year.

HKUST Teams joined a Learning Tour in January 2018 to Seoul to study E-Commerce business operation and the start-up ecosystem in Seoul

BEST Camps


B.E.S.T. Camp Partnered with J.P. Morgan

In an effort to promote entrepreneurship and students from different departments to work together, 2 BEST (Business, Engineering, Science Together) Camps were held. The first BEST Camp was organized with the support of J.P. Morgan in November 2017 to explore innovations with AI and Big Data. The second BEST Camp was organized in April 2018 and the topic was to explore the huge potential of Silver Generation Market. The students joined these camps and learnt about ideation, product design and prototyping skills as well as working in teams comprising students with different backgrounds to work out a business plan.

Entrepreneurship Seminars & Sharing

In total, over 45 entrepreneurship seminars, workshops and talks were held by EC at HKUST, with more than 2,800 students (increase by 110%) attended. One of the most successful seminars this year was with ZhenFund, which has a network of over 600 portfolio companies (including over 10 unicorns based in China). The seminar "ZhenFund Angel Investment and Start-ups in Hong Kong" was held on 25 April 2018 at HKUST. Over 300 students participated in this inspiring seminar. Xiaoping Xu, Founder and Managing Partner of ZhenFund, shared his insights and philosophy on this topic.

"ZhenFund Angel Investment and Startups in Hong Kong"

HKUST-Sino One Million Dollar Entrepreneurship Competition 2018

HKUST Associate Vice-President for Knowledge Transfer Professor Enboa Wu presented the President Award to Sinocore Biotechnology Limited

The competition at HKUST this year attracted 101 teams. It was the first time the event has a Title Sponsor with generous support from the Sino Group. A total of 24 teams got the chance to showcase their projects on HKUST campus in April 2018 to HKUST students and the general public. These 24 teams also participated in the Elevator Pitch event. Sinocore Biotechnology Limited was crowned the champion of the competition and the winner of the President Award, as well as the Innovation Award and the Mills Sustainability Prize. The company developed an innovative flocculant that can separate sewage water into sludge and catalyze fermentation of the sludge into fertilizer. The top 3 teams of the competition, comprising HKUST students, alumni and their international peers, will compete with the finalists from 7 different cities in the Grand Final to be held at the University's FYTRI in Nansha in August 2018.

The competition expanded to other regions including Beijing, Guangzhou, Shenzhen and Macau for the first time in 2016, with top 3 teams from all regions participating in the Grand Final at FYTRI in Nansha. In 2017, a total of 945 teams comprising students, start-ups and professionals from all 5 cities participated in the One Million Dollar Entrepreneurship Competition, more than doubled the number of teams from the previous year. The 2017 Grand Final was held in FYTRI in Nansha, Guangzhou on 18 August 2017. The Grand Final winner was ESIGHTEX, a Shenzhen company focuses on industrial machine vision and intelligent technologies.

Riding on the success of previous years, the Competition has expanded further to Foshan and Zhongshan in 2018, making the total participating cities to 7. It is encouraging to see the Competition, originally an initiative to nurture entrepreneurs at HKUST, to have grown into a regional contest that helps cultivate entrepreneurial spirits and promote exchange of ideas across the border.

Hackathon@HKUST

Hackathon@HKUST

Being the most influential hackathon event in Hong Kong, hackUST and hardUST offers participants from different backgrounds to enrich their coding skills in team over 24 and 48 hours, pathing towards next level of success in their entrepreneurship journey. The hackathon@HKUST is the largest student organized hackathon held in 2017 in Asia.

UHackFin

UHacKFin

HKUST Entrepreneurship Center, partnered with InvestHK and HKUST Business School, launched the InvestHK's FinTech Education Week in November 2017. A series of workshops, career fair and a FinTech Hackathon were held in the Clear Water Bay campus. This initiative aims to bring the themes, know-how and excitement about Fintech to university campuses. In addition to the opportunities to interact with a group of leading FinTech experts, HKUST students also got the chance to work with hackathon participants from 7 other local universities. More than 140 students participated in the FinTech Hackathon.

5. From Research to Market: Entrepreneurial Technology Transfer

Technology Start-up Support Scheme for Universities (TSSSU)

TSSSU Program was launched in 2014 by the ITC providing an annual funding of up to HK$4 million to 6 local universities to support technology start-ups from universities. In the reporting year, TSSSU Program has successfully attracted 47 applications. That makes the total applications for TSSSU funding to 176 at HKUST for the past 5 years. The vetting committee at HKUST, consisted of industry experts from different backgrounds, recommended 11 fundable start-ups, which makes the total number of HKUST affiliated TSSSU start-ups to 40 (Refer to Appendix H). Among the 40 TSSSU companies, over 70% of the start-ups utilize HKUST technology. 40% of the start-ups have entered into incubation programs organized by HKSTP and Cyberport.

Below are the highlights of selected HKUST affiliated TSSSU start-ups with encouraging achievements:

CoilEasy Technologies Limited: CoilEasy is a start-up focused on high performance integrated magnetic device, and operated as a fabless design house. CoilEasy designs, tests, and sells magnetic device chips and their supplementary integrated circuits. Their products are competitive for power management of CPU and mobile/wearable electronics, and high voltage modules in electric vehicles and intelligent grids. CoilEasy is collaborating with a major semiconductor foundry, as well as selected companies for product development.

Set Sail Venture Limited: Set Sail aims to bring AI to popular use in Hong Kong. The team offers an AI platform for enterprise to build conversation robots ('chatbots') in Cantonese, Mandarin and English. The chatbots can talk naturally with customers across various channels such as WeChat, Messenger and other mobile Apps. The company has provided service to over 20 companies (including shopping mall management companies, insurance company, banking industry, retail branded products, government agency, etc.). Not only do these companies improve their customer service quality, they can also conduct their sales and marketing business more conveniently on different channels.

Launch of Walter Kwok Technology Start-up Fund for HKUST TSSSU Awardees

The Walter Kwok Technology Start-up Fund has dedicated an annual funding of HK$4 million to support the HKUST TSSSU Awardees by providing interest-free bridging loan to each awardee, with an option to seek for further investment opportunity of the start-ups. In addition, mentorship and business network opportunities will be provided to the start-ups. The bridging fund provides critical cash flow assistance for HKUST start-ups during the earlier stage of their development, enabling these companies to focus on technology development.

HKUST Start-up and Spin-off Companies

Since 1999, the HKUST Entrepreneurship Program (EP) has been supporting HKUST communities in the establishment of technology-based start-ups. EP has helped the formation of 60 technology start-ups in the Clear Water Bay campus, of which 34 companies (Refer to Appendix G) have graduated from the EP. The incubation space at Clear Water Bay campus is in the process of renovation and will be completed by 2018-19. The newly renovated space will be able to accommodate more start-ups. In serving the HKUST community for their entrepreneurship needs beyond Hong Kong, HKUST has also been operating incubation programs through the Shenzhen Research Institute (SRI) in Shenzhen and FYTRI in Nansha. Under these programs, SRI and FYTRI are hosting a total of 62 start-ups (45 and 17 respectively, refer to Appendices J & K).

Connecting Start-ups to the Market

HKUST provides opportunities for affiliated start-ups to participate in marketing events, to enable these companies to showcase their products to potential customers. Below are highlights of selected marketing events:

HKUST Booth at CMEF

China International Medical Equipment Fair (CMEF): The 79th China International Medical Equipment Fair was held at the National Exhibition and Convention Center (Shanghai) on 11-14 April 2018. 2 HKUST Start-ups, Incus Company Limited and Mindvivid Limited joined the show to showcase their latest technology and medical

related products.

Startup Launchpad October 2017 & April 2018: A total of 7 technology start-ups from HKUST participated in the exhibition to showcase their cutting-edge technologies and products. These start-ups include: eTron Electronic Materials Company Limited, 3DK Tech Limited, AuVi Entertainment Inc. Limited, Hong Kong Innovative Display Technology Limited, iSTEM Limited, Pear Limited and WEXTECH HK LIMITED. Business matching opportunities were also provided for HKUST start-ups.

HKUST pavilion at Startup Launchpad

ICT Expo: 8 HKUST Start-ups joined the fair to showcase their services and products at the Home-grown Innovations Zone. This zone features Hong Kong-based companies, talent and expertise. A range of new ideas and strategies created by educational institutions and professional associations that proudly represent home-grown innovation can be found at that zone.

HKUST Booth at ICT Expo

CES Asia: 7 Technology Start-ups from HKUST participated in the exhibition to showcase their technologies and products at CES Asia 2018 in Shanghai in June 2018. CES Asia 2018 showcases technology spanning 20 product categories improving lives around the world. The event attracted more than 46,000 total attendance, including more than 1,400 members of the global media. A curated show for global brands and cutting edge start-ups, more than 500 companies with the latest in AI, augmented and virtual reality, audio/video, 5G/connectivity, digital health and vehicle tech were exhibited on the show floor.

HKUST start-up at CES Asia

ACHIEVEMENTS AND RECOGNITIONS OF HKUST STUDENTS AND START-UPS

Student Innovation Grand Award at Hong Kong ICT Awards (HKICTA) 2018

School of Engineering students Mr. Chun Ming Au and Mr. Chi Kin Benjamin Lai created UMix, an iOS based application aiming to provide a portable and innovative means of digital music production, such as converting human vocals into melodic and percussive music instruments, as the final year project of their undergraduate studies in HKUST. The project was awarded the Grand Award and the Gold Award of HKICTA 2018 for the Student Innovation Category.

HKUST students won the Student Innovation Grand Award for HKICTA 2018

Analyst's Choice Awards in the Startup Launchpad 2018

The Startup Launchpad April 2018 – Consumer Electronics was held on 11-14 April 2018 at AsiaWorld-Expo. 3DK Tech Limited, iSTEM Limited, Pear Limited and WEXTECH HK LIMITED won the Analyst's Choice Award. The Analyst's Choice Award aims to help buyers find new and innovative products at the show. Only 20 start-ups were awarded with the prize among the 200 start-ups participated in the Show. It is glad that 4 of the HKUST technology start-ups have won the award.

HKUST Start-ups won the Analyst's Choice Award

International College Student Green Energy Science and Technology Innovation & Entrepreneurship Competition

Sundial Technology, a start-up by a group of HKUST PhD students and 2016 winner of the HKUST One Million Dollar Entrepreneurship Competition, won the top prize in the "GCL Cup" International College Student Green Energy Science and Technology Innovation & Entrepreneurship Competition in Suzhou, China. The victory came over 70 teams from more than 40 universities in Greater China, Singapore and Taiwan.

Elevator Pitch Competition 2017

Out of a total of 458 applicants participating in the Elevator Pitch Competition 2017 organized by HKSTP, 6 HKUST start-ups were selected to participate in the competition among 100 finalists. The competition provided invaluable experience for budding entrepreneurs to effectively present their business cases to investors and collaborators, and will no doubt going to help them pursue their entrepreneurial endeavors.

Elevator Pitch Competition 2017

6. Strengthening Industrial Engagement and Collaboration

HKUST-CIL Joint Laboratory of Innovative Environmental Health Technologies

Signing Ceremony for HKUST-CIL Joint Laboratory of Innovative Environmental Health Technologies

HKUST and Chiaphua Industries Limited (CIL) established the HKUST-CIL Joint Laboratory of Innovative Environmental Health Technologies in May 2018. The goal of the Joint Laboratory is to develop next-generation smart technologies through innovation in materials to improve our health and environment. The team will work closely with other stakeholders from government and private sectors as well as establishing a global partnership network that includes other research centers and institutions to further strengthen the capability of the Laboratory. By providing a platform for translating conceptual ideas and laboratory research on innovative environmental health technologies into tangible products that address urgent community needs, the Joint Laboratory will not only strive for research excellence, but also actively engage in the areas of technology translation, product conceptualization, scaling-up and manufacturing, quality assurance and user experience.

HKUST-BGI Joint Research Center

HKUST and leading genomics organization BGI Group committed to establish the HKUST-BGI Joint Research Center that will set the stage for the next-generation sequencing platform and research efforts that produce novel medical diagnosis and treatments with transformative impact. The Joint Center will set up different research platforms based on the two parties' core competence and mutual interest, such as on medical imaging and high-throughput sequencing, which not only seeks to enhance and extend the scope of applied genetic studies, but also pursues novel medical treatment and diagnosis especially for certain neurodegenerative diseases which urgently require clinical interventions. The platforms will lay the foundation for facilitating multi-disciplinary research studies including aging biology, automatic medical imaging and image analysis, precision oncology targeting clonal dynamics, machine learning for medical diagnostic assistance and marine genomics.

Signing Ceremony for HKUST-BGI Joint Research Center in July 2017

Joint Laboratory on Artificial Intelligence with NAVER/LINE

HKUST becomes the first University partner worldwide with NAVER/LINE to set up the HKUST-NAVER/LINE AI Laboratory under BDI of HKUST in April 2018. The Laboratory was set up to develop a comprehensive set of research and talent-development programs to pursue cutting-edge research for the advancement of AI technology and enrich the learning experience of both undergraduate and postgraduate students. On the research side, the Laboratory will develop methods, algorithms and models, and demonstrate prototype implementations on mobile platforms such as smartphone. Possible topics include hand-tracking and posture recognition, object detection and classification, video/image segmentation, and an automatic dialog system. Meanwhile, the Laboratory will fund a PhD Student Fellowship Program to develop talent at HKUST. This joint effort will offer many opportunities to foster pioneering research in AI technology and launch extensive talent-development program that nurture future engineers to meet the needs of the AI industry.

Joint Laboratory on Artificial Intelligence and Computer Vision with Face++

HKUST and Magvii, commonly known as Face++, announced the establishment of a joint laboratory on AI and computer vision. The Laboratory will be dedicated to

Signing Ceremony with Face++

improving people's living and advance knowledge frontiers through researches in AI and image recognition and analysis. Face++ is a forerunner in AI and computer vision. The Laboratory aims to develop smarter computer vision technology, bringing together research talents from both sides and integrating the competitive edges from both academia and the industry. The collaboration also covers talent grooming and other incubation and entrepreneurship projects, providing internship and job opportunities for HKUST students.

Strategic Partnership with DiDi ChuXing

HKUST formed a partnership with DiDi ChuXing in smart transportation research and the construction of smart cities. Under the partnership, HKUST and DiDi ChuXing will collaborate in cutting-edge research and development in smart transportation systems, including but not limited to machine learning, intelligent transportation, data mining, operations research, natural language processing, computer vision and robotics. HKUST and DiDi ChuXing will cooperate in personnel training and development, academic exchange, as well as start-up incubation.

HKUST-MIT Research Alliance Consortium

The goal of the HKUST-MIT Research Alliance Consortium is to facilitate pre-competitive research projects between industry, local universities and Massachusetts Institute of Technology (MIT). It is anchored by a consortium of 10 companies, including industry leaders, with active interests in advanced pre-competitive research which can lead to new capabilities and business opportunities. Technology clusters under the Alliance currently focus on IoT for intelligent buildings and transportation, data science & e-Learning, advanced manufacturing and biomedical systems. In total there are 16 projects currently operating under the Consortium and a further 16 projects are being planned. The Consortium represents close collaboration amongst universities, industries and government to bolster global innovation with emphasis on Intelligent Living Technology.

Executive Education Program

Executive Education Office offers Open and Company Programs to executives

HKUST Business School (SBM) offers an extensive Executive Education Program that prepares executives for the challenges of today's increasingly globalized business marketplace. 2 types of programs, Open and Company, are offered. Open Programs provide individuals a platform to sharpen skill sets and acquire the cutting-edge insights that help companies prosper and better prepare for the new challenges and responsibilities found in today's workplace while Company Programs are tailored to meet the specific needs of organizations. In 2017-18, 15 Open Programs and 32 Company Programs were offered to over 1600 participants from over 180 companies/organizations. A wide range of topics were covered in these Programs, including Fintech for Non-technical Executives & Professionals, Corporate Innovation & Growth, Managerial Decision Making & Leadership, Family Office, Cyber Security & Risk Management, Environmental, Social and Governance (ESG) Investing, and Effective Negotiations.

7. Enhancing Community Engagement

HKUST organized events open to industries, the private sector and the general public as part of the KT endeavors. In the reporting year, there were 669 public lectures, workshops, and seminars organized. In addition, 99 performances and exhibitions of creative works were also reported for the year 2017-18. The following examples highlighted selected community engagement activities at HKUST.

HKUST Revealed Report on Innovation and Technology Development of Greater Bay Area

The Institute for Public Policy (IPP) at HKUST published the first report on the integrative development of innovation and technology (I&T) in the Greater Bay Area. The research report, jointly conducted by the Chinese Academy of Engineering, Hong Kong Academy of Engineering Sciences and IPP, has highlighted the risks faced by Hong Kong if we do not speed up in I&T, and made a number of suggestions on what the government should do. The report argued, for example, that the government's laissez-faire policy is out-of-date, so it must take the lead with regard to R&D investment, training and policy development to foster I&T for small companies. The report also gave ideas on how Hong Kong and the Greater Bay Area cities should strengthen their collaborations in specific strategic areas.

Seminars on Public Policy

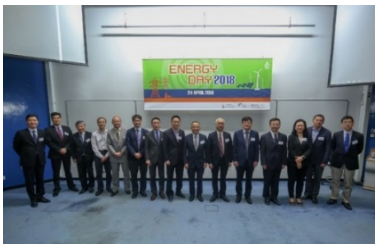
LAPP Distinguished Lecture

With Public Policy as one of the University's strategic focus, HKUST is making a conscious effort in raising public awareness on public policy. The Institute for Public Policy (IPP) organized 3 IPP Seminars in 2017-18, covering topics ranging from environment issues to the Guangdong-Hong Kong-Macao Bay Area Development, as well as demographic challenge of China and North-East Asia. 2 distinguished lectures were hosted by the Leadership & Public Policy Executive Education (LAPP) to discuss about President Trump's policies in his first year of service and the importance of demography to Hong Kong. Renowned scholars worldwide and government officials were invited to deliver the seminar talks and shared their experiences on the topics. These seminars were well-received by the audience. By engaging the public in various seminars, HKUST is disseminating public policy education and pushing forward its public policy research.

Partnership on AI to Spearhead Ethnical AI Development

HKUST has recently joined an international not-for-profit consortium – Partnership on AI to Benefit People and Society (PAI) – to promote the development of ethical AI to ensure safety, security, privacy, transparency and fairness of such technology in Asia. PAI offers an open and inclusive platform for a wide range of organizations to develop and share best practices, advance public understanding as well as identify and foster aspirational efforts in the area of AI. Founded by technology conglomerates including Amazon, Google, Facebook and Microsoft, PAI admitted HKUST as the first Asian institution to join its prestigious league. HKUST's representative in this Partnership is Professor Pascale Fung from ECE, a leading expert in the area of speech and language processing. She joined a 2-day forum in Berlin in October 2017, to exchange with global experts on issues including AI safety, security, AI and labor and AI's social and societal influences.

HKUST Energy Day



HKUST Energy Day

The Energy Day 2018, organized by the HKUST Energy Institute in April this year, attracted over 250 participants from academic, government, industry and the general public. The Energy Day provided a great platform for participants to exchange ideas and visionary look of how policy, innovation and applied technologies to foster the green growth and sustainability that has potential to benefit the society. The Keynote Lecture was delivered by Mr. Chin-wan Tse, BBS, JP, Under Secretary for the Environment, HKSAR Government, stated that as set out in Hong Kong's Climate Action Plan 2030+, the government will take the lead to apply renewable energy on a wider and larger scale in the immediate years ahead. In parallel to the presentations and discussion, the Energy Day also featured interactive demonstrations and exhibits to showcase research and education activities on new energy technologies at HKUST.

LIBRARY EXHIBITIONS

Happiness in the Making – An Exhibition of Works by Rosanna Li Wei Han

HKUST Library (LIB) organizes quality exhibitions to engage the community in promoting art and culture. In the year 2017-18, LIB organized 7 exhibitions. The exhibits covered western calligraphy, photography, Chinese ink paintings, ceramics, installation art, Chinese antique maps, photos and city views. In connection with the exhibits, LIB also organized public talks, demonstrations and guided tours. An online "Exhibition Feedback" system developed by HKUST LIB staff and students was used to solicit visitor's comments. According to the comment received, visitors appreciated and enjoyed the events, stating that these activities let them learn more about art and life, showing that the events are well-received.

GUEST SCIENTIST IN TVB EDUCATIONAL PROGRAM "SIDEWALK SCIENTIST"

Dr. Jason Chan in TVB Program

Dr. Jason Chan from the Department of Chemistry made his regular presence as Guest Scientist in 12 episodes of a TVB education program "Sidewalk Scientist (學是學非)" to present and explain different concepts of chemistry and scientific phenomenon related to our daily lives in an interesting and dynamic way. Through the air time in the television broadcast, Dr. Chan has successfully aroused audience's interest in exploring scientific knowledge in daily lives.

HKUST STEM MONTH

HKUST STEM Month, was launched by the Academy for Bright Future Young Engineers in July 2017. Aiming to let secondary school students learn about engineering through hands on projects to foster a new generation of engineers in Hong Kong, a total of 19 STEM-related activities targeting secondary school students were conducted during the STEM Month, including the Paper Tower Challenge, Junior Achievement Engineering Discovery Day, and "Students as Learning Experience Designers" Learning Symposium & Poster Presentation Day. In addition, 16 workshops of wide-ranging topics were held throughout the month. The activities in STEM Month were well attended by over 800 students from 40 secondary schools in Hong Kong.

8. IMPACT CASES

MAKING WAY FOR FINTECH – AQUMON BY MAGNUM RESEARCH LIMITED

AQUMON

A robo-advisory engine to assist clients in global asset allocation developed by a HKUST Start-up - Magnum Research Limited

With the rapid development of financial technology (FinTech), radical changes are introduced to service and products for financial institutions. In the past, global asset allocation is only available to limited parties because of heavy costs associated to financial institutions. Dr. Don Huang, an alumni from the Department of Mathematics (MATH) of HKUST, together with his partner, Mr. Kelvin Lei, saw the opportunity to revolutionize the concept of wealth management by bringing automation, transparency, and cost-efficiency to the process, founded Magnum Research Limited in 2015. The company developed AQUMON, a robo-advisory engine with service covering finance, algorithm and information technology. The name AQUMON—coined by combining the words "accurately" and "monitor"—reflects their resolve to accurately monitor the financial market and manage clients' investments and risks.

The company joined the HKUST Entrepreneurship Program (EP) in 2016. The Program provided them with an incubation space with various resources essential for growing their business while the MATH and SBM helped recommend bright and talented students to join the company. With a strong R&D root and targets the pain points of wealth by bringing automation and customization, AQUMON provides customized, automated and algorithm-based portfolio management services directly through a cloud-based platform. Utilizing modern portfolio theory, stochastic control and statistical techniques, AQUMON optimally designs the portfolio allocation according to the risk preference of the investors, thus making global asset allocation affordable to regular investors.

AQUMON delivers robust services to both financial institutions and retail investors and let them benefit passively from global economic growth. The company has grown rapidly since its inception with 50 employees currently in Hong Kong, Mainland China and Singapore offices, with HKUST alumni accounted for 40% of the total workforce. The company is financially backed by Alibaba and is the first "robo-advisor" with licenses granted by the Securities and Futures Commission of Hong Kong, allowing the company to serve retail investors in Hong Kong.

LETTING EVERYONE HEAR – INCUS COMPANY LIMITED

Professor Richard So from the Department of Industrial Engineering and Decision Analytics (IEDA) has long-established research on audio perceptions in noise and binaural hearing, as well as computational ergonomics for enhancing the human experience in sight and sound. He and his student Mr. Calvin Zhang, from the MPhil Program in Technology Leadership and Entrepreneurship (TLE), came up with a new way of separating target signals, such as speech, from irritating background noise, enhancing clarity in difficult listening environments. This innovation can potentially improve the hearing qualities for millions of hearing impaired.

Incus has been well recognized in several entrepreneurship competitions

The technology is built on an algorithmic framework, combining pattern recognition and binaural directional sound technology. It is similar to the brain's ability to cope with even tiny differences in sound. The algorithms capture and label audio signals according to their acoustical attributes, including frequency, tempo and amplitude. Targeted signals are effectively separated from other undesired signals, which significantly enhanced performance of the hearing devices.

Professor So and Calvin co-founded Incus Company Limited for commercialization of the technology. At the early stage, Incus received critical funding support from TSSSU and YWYEF. Incus was also admitted to the HKSTP Incubation Program, as well as receiving strategic investment for the company. Incus has since launched a Hearing Test App as well as Hearing Aid App, in addition to the development of standalone hearing aid devices. The mobile Apps combine innovative technology with new sales model by offering potential customers a chance to try the product. The company has launched online sales channels and developed technology driven customer-relationship management (CRM) systems as well as offline sales channels through local elderly organizations and audiologist clinics. The team has also expanded its user testing and trial manufacturing in Shenzhen to target the huge China market. Incus has received a number of awards in many entrepreneurship competitions, including the First Prize in the First Qianhai Shenzhen-Hong Kong Youth Innovation and Entrepreneur Competition, as well as the Silver Prize in the Sixth Bank of China (HK) Federation of Innovative Technologies and Manufacturing Industries (FITMI) "Technology Start-Up" Award.

ENHANCE QUALITY CONTROL STANDARDS FOR THE HEALTHCARE INDUSTRY

Since 2012, the Testing Laboratory for Chinese Medicine (TLCM) at HKUST has been providing professional Traditional Chinese Medicine (TCM) testing, quality control and certification services in Hong Kong. The Laboratory maintains a significant library of TCM biomarkers, which are made available to the TCM community. With the use of biomarkers identified in different TCM, HKUST researchers have implemented a new method for TCM quality control, which will benefit the nutraceutical industry. The method can facilitate further development, advancement and enforcement of quality control standards in the local industry to ensure quality and safe use of nutraceutical products.

The Testing Laboratory for Chinese Medicine (TLCM) provides professional Traditional Chinese Medicine testing, quality control and certification services

In particular, for the quality control of edible bird's nest (EBN), a glue-like substance secreted by the specific glands of the swiftlets, has been a valuable Chinese delicacy for several hundreds of years. Despite of the long history of human consumption, the detailed chemical compositions and biological functions of EBN are largely unknown. Professor Karl Tsim and his research

team from the Division of Life Science (LIFS) developed an advanced and reliable authentication method for EBN by using free N-acetyl-D-neuraminic acid (NANA) as the indicative marker. This developed method successfully differentiated fake EBN materials from the genuine EBN in a fast and reliable manner. Furthermore, the method could classify different classes of EBN quantitatively. HKUST has successfully partners with a local cosmetic care product manufacturer to commercialize different skin care products based on quantitative testing of biomarkers in edible bird's nest. Additional research projects are ongoing with the company on other nutraceutical products.

Revolutionary Microscopy Technology - Light Innovation Technology (LiT) Limited

Professor Shengwang Du and Professor Michael Loy from the Department of Physics (PHYS) developed a new generation of microscope, which not only could capture 3D live cell videos, but the resulted images are also of much higher quality, greatly enhancing the accuracy and the scope of research on cell biology.

Light Innovation Technology (LiT) Limited

While an existing confocal microscope can also capture 3D bio-images, the laser light hitting on the live cell sample is typically 1 million times that of summer sunlight, such intense light exposure inevitably disrupts live cell activities and eventually kills the cell, posing limits to the study of cell biology.

The LiTone Line Bessel Sheet (LBS) microscope invented by the research team, however, is 1,000 times less photo-toxic than the current confocal model, allowing the cell to live much longer for observation. Photo-toxicity is a type of sensitivity induced by light, which could cause molecular changes. The new microscope is also about 1,000 times faster, allowing much higher temporal resolution for a smooth video taking. One example in life science research application is that this LBS microscope can show how proteins are transported within cells with great accuracy and efficiency, and what happens when the cell becomes abnormal.

Professor Du, Professor Loy, as well as their PhD students co-founded Light Innovation Technology (LiT) Limited to commercialize the technology. LiT was a recipient of the TSSSU award for the year 2017-18. In addition, LiT has won the Innovation Award and the GF Securities Award at the HKUST One Million Dollar Entrepreneurship Competition in 2017.

LiT is actively exploring market in Hong Kong, Mainland China, and the USA. In 2018, LiT achieved the first commercial delivery of the LiTone LBS light-sheet microscope to a local university as well as an institution in Mainland China. And with further business effort from the company, more sales are anticipated.

Establishment of Institute for Interdisciplinary Research on Solving Industry-Relevant Challenges

HKUST believes by creating an interdisciplinary environment at the University, together with collaborations with industry partners in R&D, can result in impactful research outputs to the society. One of such examples is demonstrated by the Big Data Institute (BDI) at HKUST. Leveraging on the existing strength and resources of the University, BDI was established upon the needs from both industry and society for a new model for managing multi-disciplinary focal points for Big Data research, by coordinating faculty's research on Big Data and Data Science at HKUST. BDI strives to provide a strong and highly visible leadership role in Big Data and Data Science research in Hong Kong and worldwide.

The BDI is a multiple-center based institute, with each center focusing on a strategic area and has external support from the industry as well as the Government. Led by Acting Director Professor Lei Chen from the Department of Computer Science and Engineering (CSE) and Associate Director Professor Yang Wang, Dean of Science (DSCI), and composed of over 40 affiliated faculty from across departments at HKUST, BDI's members carried out collaborative research in different areas. Members of BDI partnered with industry leaders to perform collaborative research with big impact to society. Examples were ITF platform projects on Smart Transportation and Smart City that partnered with Thales, the global leader in mass transportation and Digital China, one of the largest integrated IT service provider respectively. Through these collaborations, HKUST researchers gained access to valuable data in selected domains for research and development, while companies will have access to top notch research at HKUST, creating a win-win situation to both parties.

The WeChat-HKUST Joint Lab on Artificial Intelligence Technology (WHAT LAB), established in 2015 under BDI, aims to collaborate across multiple areas of intelligent robotic systems, natural language processing, data mining, speech recognition and understanding. WHAT LAB represents a long term partnership between Tencent and HKUST, to jointly conduct AI related research. The partnership enables HKUST researchers to work on industry-relevant challenges with the company, and it is important to note that selected research outputs from the WHAT LAB have been implemented in Tencent's products, a testament to the successfully partnership between the two parties.

HKUST collaborated with Tencent to set up WHAT LAB under BDI

Other centers under the BDI include the Big Data for Bio Intelligence Laboratory (BDBI), that conduct research of big data for biological intelligence and to bridge the knowledge gap between academics and practitioners, as well as the HKUST-NAVER/LINE AI Lab for the advancement of AI technology. BDI will continue to seek collaboration partners from the industry with the goal to advance Big Data and Data Science research in addressing challenges that the industry faces.

9. LOOKING FORWARD

HKUST will continue to march forward in pursuing the KT strategic goals set forth in this Triennium. Looking forward, HKUST is excited to the implementation of the HKUST Entrepreneurship Fund that should provide critical funding support for HKUST start-ups. In addition to the revamped EP, HKUST should be able to provide a comprehensive support to young and energetic entrepreneurs. HKUST will also continue to proactively seek for collaboration opportunities with industry partners, while mindful of HKUST's responsibility in enhancing community engagement by KT to the society.

Meanwhile, HKUST is encouraged to see Hong Kong SAR Government's commitment in Innovation and Technology with the latest Policy Address and Budget, providing important resources and infrastructure support to different stakeholders in Hong Kong, including HKUST. The University is also looking forward to the opportunities that the Greater Bay Area Initiative, as well as the development of the Lok Ma Chau Loop will bring to the region. HKUST will proactively pursue these opportunities to exert HKUST as the leader of KT that brings social and economic impact to the region, and also assist Hong Kong to be an international innovation and technology hub.

APPENDIX A – KEY PERFORMANCE INDICATORS

Performance Indicator	2017/18 (Projection)		2017/18 (Achieved)	
Inventions, Patents, Licenses, IP, Contracts, and Services				
Number of invention disclosures received and reviewed by TTC [Note 1 & Note 2]	100		153	
Number of patents filed in the year [Note 1 & Note 2]	150		244 [Note 3]	
Number of patents granted in the year [Note 1 & Note 2]	100		143 [Note 4]	
Number of total active licenses granted [Note 5]	70		107	
Income (on cash basis) generated from intellectual property rights [Note 5 & Note 6]	$7M		$6.7 M	
Number of new licenses granted in the year [Note 5]	15		14	
Number of collaborative researches, and income thereby generated [Note 5]	80	$160M	130	$189.2M
Number of contract researches (other than those included in "collaborative researches" above), and income thereby generated [Note 5]	150	$72M	236	$88M [Note 7]
Number of consultancies, and income thereby generated [Note 5]	25	$7M	14	$2.9M [Note 8]
Number of equipment and facilities service agreements, and income thereby generated [Note 5]	480	$3M	835	$5.6M
Sub-total Income	$249M		$292.4M	
Gap Funding				
Number of Proof-of-Concept Fund projects reviewed / funded [Note 9]	20	8	14	9
Number of HKUST U*STAR Program projects reviewed / funded (*previously known as Innovation Acceleration Fund*) [Note 10]	20	8	13	8

[Note 1] Starting from 2013/14, the number reported also including invention disclosures, and patents filed and granted by Mainland Platforms.

[Note 2] The numbers are counted based on the definition laid down by UGC under the Common Data Collection Format (CDCF) according to the (1) number of country of filings plus (2) the number of patent types which is defined in accordance with the international patent classification (i.e. technology area) of the patents.

[Note 3] CDCF Table 65: The number of patents filed is 244 and the number of inventions involved is 204 in the 2017/18 period.

[Note 4] CDCF Table 66: The number of patents granted is 143 and the number of inventions involved is 76 in the 2017/18 period.

[Note 5] Starting from 2017/18, the number reported also including number of total active licenses granted, new licenses granted, income (on cash basis) generated from intellectual property rights, collaborative researches, contract researches (other than those included in "collaborative researches"), consultancies, equipment and facilities service agreements, and income thereby generated by Mainland Platforms.

[Note 6] It includes both licensing incomes from patent via RDC, Mainland Platforms as well as copyright of courseware via the University.

[Note 7] The total number of new contract and contract value for contract researches agreements signed in the 2017/18 period is 153 and HK$111.3M.

[Note 8] The total number of new contract and contract value for consultancy agreements signed in the 2017/18 period is 7 and HK$1.3M

[Note 9] The Proof-of-Concept Fund (PCF) is established to perform technology validation in the pre-commercialization stage.

[Note 10] The HKUST U*STAR Program (previously known as Innovation Acceleration Fund) is established to serve as another channel of gap funding support to complement the current Proof-of-Concept Fund (PCF) with a focus gears more on the business side. This is to support development of business idea by turning it into a practical business and implementation plan.

Performance Indicator	2017/18 (Projection)		2017/18 (Achieved)	
Entrepreneurial Education and Culture				
The BASE utilization: number of visitor / dwell time	10000	1 hour	8151	0.6 hour
Number of teams for One Million Dollar Entrepreneurship Competition at the Clear Water Bay campus [Note 11]	100		101	
Number of teams for HackUST: total teams / HKUST teams [Note 12]	100	65	95	73
Accelerator: number of teams / companies [Note 13]	40		67	
Percentage increase of student participation from School of Science in major entrepreneurial events [Note 14]	20% increase		26% increase	
Number of advising hours for student entrepreneurs	500 hours		513 hours	
Quality of events through on-line feedback form	average 4.0 out of 5.0		average 4.1 out of 5.0	
Start-up and Spin-off Companies				
Number of economically active start-up and spin-off companies affiliated with HKUST	80		184 [Note 15]	
Number of start-ups newly set up affiliated with HKUST	18		37 [Note 16]	
Contributions to the Public				
Number of student contact hours in short courses or e-learning programmes specially tailored to meet business or CPD needs	24,080 hours		1,648,555 hours [Note 17]	
Income received from Continuing Professional Development (CPD) courses	$20.0M		$502M [Note 17]	
Number of public lectures / symposiums / exhibitions and speeches to a community audience	528		669	
Number of performances and exhibitions of creative works by staff or students	60		99	

[Note 11] HKUST One Million Dollar Entrepreneurship Competition is one of Entrepreneurship Center (EC)'s annual flagship events. It is a platform for the students and alumni to realize their business ideas into a real business.

[Note 12] HKUST HackUST is one of EC's annual flagship events. It has also become one of the largest hackathon organized in Asia. Students from HKUST as well as other universities in Hong Kong hack out prototype of hardware/software solutions over a weekend (non-stop) to solve real problems.

[Note 13] Accelerator includes Funding Programs and Co-working Space Programs for HKUST start-up teams or companies.

[Note 14] The ratio of the School of Science (SSCI) students joining EC's events and activities were relatively low, effort had been made to encourage more SSCI students to join entrepreneurship activities, e.g. Seminar, Start-up Weekend and Training Camp with science theme. In 2016/17, the figure only includes the increase of 90% of SSCI students' participation in HKUST One Million Dollar Entrepreneurship Competition. From 2017/18 onwards, the figure also includes percentage increase of SSCI student's participation in HKUST One Million Dollar Entrepreneurship Competition, HackUST, BEST Camp, and other seminars and workshops.

[Note 15] Starting from 2017/18, the number of economically active start-up and spin-off companies affiliated with HKUST reported including the economically active start-up and spin-off companies being funded, incubated or coached by the entrepreneurship programs located in the Clear Water Bay Campus and Mainland Platforms. The entrepreneurship programs include the HKUST Entrepreneurship Program (EP), Technology Start-up Support Scheme for University (TSSSU) Program, HKUST U*STAR Program, Yeung Wing Yee Entrepreneurs Fund (YWYEF), HKUST Entrepreneurship Acceleration Fund, Alumni Endowment Fund (AEF) Student Start-up Grants, HKUST One Million Dollar Entrepreneurship Competition, and programs under the Blue Bay Incubator and Innovation & Entrepreneurship Center (I&E Center) of HKUST Shenzhen Research Institute (SRI) in Shenzhen and other programs under Guangzhou HKUST Fok Ying Tung Research Institute (FYTRI) in Nansha. For companies funded, incubated or coached by more than one programs or having offices in more than one location only counted once.

[Note 16] Starting from 2017/18, the number of start-ups newly set up affiliated with HKUST reported including start-up companies being funded, incubated or coached by the entrepreneurship programs located in the Clear Water Bay Campus and Mainland Platforms. The entrepreneurship programs include the HKUST Entrepreneurship Program (EP), Technology Start-up Support Scheme for University (TSSSU) Program, HKUST U*STAR Program, Yeung Wing Yee Entrepreneurs Fund (YWYEF), HKUST Entrepreneurship Acceleration Fund, Alumni Endowment Fund (AEF) Student Start-up Grants, HKUST One Million Dollar Entrepreneurship Competition, and programs under the Blue Bay Incubator and Innovation & Entrepreneurship Center (I&E Center) of HKUST Shenzhen Research Institute (SRI) in Shenzhen and other programs under Guangzhou HKUST Fok Ying Tung Research Institute (FYTRI) in Nansha. For companies funded, incubated or coached by more than one programs or having offices in more than one location only counted once.

[Note 17] Starting from 2017/18, the number reported also includes the taught postgraduate programs (including EMBA, MBA, MSc, MA, PgD) with reference to the definition of Continuing Professional Development (CPD) courses laid down by UGC under the Common Data Collection Format (CDCF).

Number of staff engaged as members of external advisory bodies including professional, industry, government, statutory or non-statutory bodies	402	442

APPENDIX B – APPROVED PROJECTS OF THE PROOF-OF-CONCEPT FUND IN 2017/18

Project Title
1. An STEM Experimental/Demo Kit: Oil-Spill Monitoring
2. Navigate to the Books in the Library Using Lisee Technology
3. Development of High-Performance, Low-Power Uncooled Infrared Microsensor Based on Sige Micropillars
4. User Presence-Aware Firmware and IoT Analytics for Long-Lasting Bacon-based IoT Network
5. Deep Learning for Anti-Money Laundering
6. Development of a Computer Software for Design and Optimization of Cellular Structures for 3D Printing
7. Optimization of Smart Windows with Haze Free Reverse Mode Liquid Crystal Light Control Film
8. Scale-up of a Three-Dimensional Cell Culturing Technology Based on Photoresponsive Protein Hydrogels and Its Commercialization
9. Development of a Direct Method for Diagnosing Multiple Concurrent Mutations Indicative of High-Risk Pregnancy

APPENDIX C – APPROVED PROJECTS OF THE HKUST U*STAR PROGRAM IN 2017/18

Project Title
1. 2D / 3D Switchable Liquid Lens Unit on Shopping Experiences
2. CryoChip - An Automated Human Eggs and Embryos Cryopreservation Platform for In-Vitro Fertilization (IVF)
3. GeLITE
4. L-evolution Technology
5. Pavaner
6. ScrollDeck
7. Smart Tree Risk Management System
8. WOLO Health Detection System for Children

APPENDIX D – APPROVED PROJECTS OF THE HKUST ENTREPRENEURSHIP ACCELERATION FUND IN 2017/18

Project Title
1. 80/20 Media Company Limited
2. An AI Based Industrial UAV for Inventory Management
3. Autonomous Domestic Water Purification System with Mobile Application
4. Barcoholic
5. Cakee
6. Challenge Cup 挑戰盃 – 全國大學生課外學術科技作品競賽 2017 in Shanghai
7. Chao (Entr 1001 17-18 spring course project group 3: online Shop)
8. Classly
9. Development of a Prototype for Portable Water Generation from Greywater Remediation
10. Direct Drive
11. Do MORE
12. Find Your Tutor - Your Tutorial Solution
13. Finding Mini (小巴到那兒)
14. FoodieCode
15. GENergy
16. giftVIVA Limited
17. HerboT Biotech Limited (藥姬生物科技有限公司)
18. Inflo: Revolutionizing the Flow of Information
19. KEWK - A Coupon App for Stores and Consummers
20. Mamahelpers Limited
21. Maxfull Technology Limited (萬暉科技有限公司)/ Development of an anti-aphthous ulcer and anti-acne gel from an anti-inflammation formulation
22. Mobile Application "Tree Hole"
23. Online shop project for ENTR1001
24. PAKTS Online
25. Pavaner*
26. PhotoSoc
27. Sidetracked
28. Snackit
29. SnapNotes
30. Solomon Biotech and Health Care Limited
31. STEM Education Platform
32. TIXIT
33. TradeBlock
34. TURNED-E! STEM Education
35. Unleash (Champion team of Uptown x HKUSTEC E-Commerce Challenge 2017)
36. Untitled Podcast
37. Vocabno
38. WOLO Health Detection System for Children*

Note: The companies with * have also been included in the List of Appendix C.

APPENDIX E – APPROVED PROJECTS OF THE ALUMNI ENDOWMENT FUND IN 2017/18

Project Title
1. Cyrochip
2. EZT (EasyTea)
3. Facile
4. Inflo
5. MamaHelpers Limited*
6. T-101
7. Uni-ox
8. Visor

Note: The project with * is also included in the List of Appendix D.

APPENDIX F – ACTIVE START-UP COMPANIES OF THE HKUST ENTREPRENEURSHIP PROGRAM

Admitted Year	Company Name
2015-2016	1. Free Flow Technology Limited
	2. Guangzhou Mesh Info Technology Limited
	3. Hong Kong Innovative Display Technology Limited
	4. Magnum Research Limited
	5. Mannay Biotechnology (Hong Kong) Company Limited
	6. 廣州材智新材料科技有限公司

APPENDIX G – ACTIVE SPIN-OFF COMPANIES OF THE HKUST ENTREPRENEURSHIP PROGRAM

Graduation Year	Company Name
2017-2018	1. AuVi Entertainment Inc. Limited
	2. Everest Innovation Technology Limited
	3. iVo Technologies Company Limited
2016-2017	1. Sane Form Limited
2015-2016	1. CWB Tech Limited
	2. eTron Electronic Materials (Hong Kong) Co. Limited
	3. Guangdong Hiway Integrated Circuit Technology (HK) Limited
	4. Wah Kin Holdings Limited
2014-2015	1. BioRx Limited
	2. Congruence Technology Limited
	3. HKG Technologies Limited
	4. NEOID Limited
2012-2013	1. HiHex Limited (formerly name AURA Human Technology Limited)
	2. LEDoS Technology Limited
	3. SupBuyer.Com (HK) IT Company Limited
2010-2011	1. Fustec Company Limited
	2. Gene-vinate Limited
	3. R & C Biogenius Limited
2008-2009	1. Advanced Packaging Technology Limited (renamed as Advanced Photoelectronic Technology in Jan 2009)
	2. Googol Technology (Hong Kong) Limited
	3. Himax Display, Inc (formerly named Integrated Microdisplays Limited)
	4. MicroWeb Limited
	5. PharmacoGenetics Limited
2007-2008	1. Blue Solve Limited
	2. LiteMagic (Hong Kong) Limited
2006-2007	1. Acron International Technology Limited
	2. Bike Elements Limited (formerly named Integra Antennas Limited)
	3. Bio-Click Technologies Limited
	4. MoFinity Limited
	5. TIM EDPlatform Limited
2005-2006	1. HongDa Financial Holding Limited (formerly named Perception Digital Limited)
2004-2005	1. Brilliant Concept International Group Limited (formerly named Brilliant Concept Technologies Limited before Mar 2013)
2001-2002	1. Radica Systems Limited
	2. SinoCDN Limited

APPENDIX H – TECHNOLOGY START-UP SUPPORT SCHEME FOR UNIVERSITIES (TSSSU) FUNDED COMPANIES BETWEEN 2014/15 – 2018/19

Year	Company Name
2018-2019	1. 3DK Tech Limited
	2. DropX Biotech Limited
	3. Gense Technologies Limited
	4. Infitech Limited
	5. INNOWAT Limited
	6. I-Square technology (Hong Kong) Limited
	7. iSTEM Limited
	8. P-Sense Limited
	9. Sourcebrella Inc Limited
	10. Without Limited
	11. WEXTECH HK LIMITED
2017-2018	1. Bio-Trick Limited
	2. Blue Innowater Co Limited
	3. CoilEasy Technologies Limited
	4. Cytofluidics Biotechnology Limited
	5. Incus Company Limited
	6. Light Innovation Technology Limited
	7. Oxpecker Labs Limited
	8. Set Sail Venture Limited
	9. Sundial Technology Development Limited
2016-2017	1. AIEgen Biotech Co., Limited
	2. beNovelty Limited
	3. CoilEasy Technologies Limited
	4. Compathnion Technology Limited
	5. DelTron Intelligence Technology Limited
	6. Mindvivid Limited
	7. MultiMedia Big Data Analytics Limited
	8. NovaMatrix Limited
	9. Pear Limited
	10. SeaSafe Limited
2015-2016	1. Acoustic Metamaterials Company Limited
	2. eTron Electronic Materials (Hong Kong) Co. Limited*
	3. Everest Innovation Technology Limited*
	4. Free Flow Technology Limited*
	5. Hong Kong Innovative Display Technology Limited*

	6. Jetcomm Technologies Limited
	7. NanoBioImaging Limited
	8. Sonikure Technology Limited
	9. Yfisoft Limited
2014-2015	1. Acoustic Metamaterials Company Limited
	2. Ananflow Technology Limited
	3. Everest Innovation Technology Limited*
	4. Hong Kong Innovative Display Technology Limited*
	5. iVo Technologies Company Limited*
	6. NanoBioImaging Limited
	7. Yfisoft Limited

Note: The companies with * have also been included in the List of Appendices F or G.

APPENDIX I – START-UP COMPANIES SUPPORTED BY YEUNG WING YEE ENTREPRENEURS FUND IN 2017/18

Company Name
1. 3DK Tech Limited*
2. Beon Limited
3. Im's Laboratory
4. I-Square Technology Limited - Image Anti-counterfeiting Solution
5. iSTEM Limited*
6. KOL Bank
7. Kremers Technology Limited
8. LivED Limited Company
9. Mamosound
10. Midiwex Limited
11. MultiMedia Big Data Analytics Limited
12. P-Sense Limited*
13. Sightecho Limited

Note: The companies with * have also been included in the List of Appendix H.

APPENDIX J – ACTIVE START-UP COMPANIES HOSTED BY THE HKUST SHENZHEN RESEARCH INSTITUTE (SRI)

Department	Company Name
General	1. 深圳西夢貝資產管理有限公司
	2. 深圳迅策科技有限公司
	3. 深圳操盤俠網絡科技有限公司
	4. 固高科技（深圳）有限公司
	5. 國財金融培訓集團有限公司深圳分公司
	6. 深圳市雲洲創新科技有限公司
	7. 深圳市唐仁醫療科技有限公司
	8. 深圳市大疆創新科技有限公司
	9. 深圳木成林科技有限公司
	10. 深圳金魔方互聯網金融服務有限公司
	11. 遨想科創（深圳）有限公司（原名幻音科技（深圳）有限公司）
	12. 博通集成電路（上海）股份有限公司深圳分公司
Blue Bay Incubator	1. 元訊信息技術（深圳）有限責任公司
	2. 圓夢信息技術（深圳）有限公司
	3. 深圳前海藍天碧水有限公司
	4. 深圳加創科技有限公司
	5. 深圳市雲影網絡科技有限公司
	6. 泛訊科技（深圳）有限公司
	7. 深圳咖咖生物科技有限公司
	8. 深圳市石笛科技有限公司
	9. 深圳市科凝生物材料有限公司
	10. 隱形科技（深圳）有限公司
	11. 深圳市微思町科技有限公司
Innovation & Entrepreneurship Center	1. 深圳前海元古網絡科技有限公司
	2. 深圳前海酒嘉坊科技發展有限公司
	3. 深圳康譜生物科技有限公司
	4. 深圳市宇星展睿教育有限公司
	5. 深圳市方格大為科技有限公司
	6. 深圳市明思數據科技有限公司
	7. 深圳市飛映技術有限公司
	8. 耀創新（深圳）投資管理顧問有限公司
	9. 首影科技（深圳）有限公司
	10. 深圳市超級碼力科技有限公司
	11. 深圳市漢深知識產權諮詢有限公司
	12. 深圳市安伯斯科技有限公司
	13. 深圳市瓏大科技有限公司
	14. 微視傳媒科技（深圳）有限公司
	15. 深圳新征程節能環保服務有限公司

	16. 深圳前海天下創業教育科技有限公司
	17. 微思智鏈信息技術（深圳）有限公司
	18. 深圳市鼎新曉信息科技有限公司
	19. 能量（深圳）科技有限公司
	20. 深圳市前海胡桃科技有限公司
	21. 深圳前海普拉達生態科技有限公司
	22. 弘量（深圳）投資管理有限公司

APPENDIX K – ACTIVE START-UP COMPANIES HOSTED BY THE GUANGZHOU HKUST FOK YING TUNG RESEARCH INSTITUTE (FYTRI)

Company Name
1. 廣州數極信息科技有限公司
2. 廣州綠膜新材料科技有限公司
3. 廣州盛世項目投資有限公司
4. 廣州樂享自然文化發展有限公司
5. 華辰環保（廣州）有限責任公司
6. 廣州雄昂科技有限公司
7. 廣州瑞斯科凌科技有限公司
8. 廣州雅臣醫藥科技有限公司
9. 廣州思成科技有限公司
10. 廣州清文科技有限公司
11. 廣東中科實數科技有限公司
12. 廣州市風力新能源科技有限公司
13. 廣州阿南創意諮詢有限公司
14. 廣州未山資訊科技有限公司
15. 廣州碼石資訊科技有限公司 (Guangzhou Mesh Info Technology Limited) *
16. 廣州市麥瀾科技有限公司
17. 廣州材智新材料科技有限公司*

Note: The companies with * have also been included in the List of Appendix F.