FUSION

THE POTENTIAL OF TECHNOLOGY AND DESIGN

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

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SUTD'S NEW DEGREE PROGRAMMES

SUTD has launched two new programmes – the SUTD Technology Entrepreneurship Programme (STEP) and the Master of Science in Security by Design (MSSD). Here is a brief description of each programme:

SUTD TECHNOLOGY ENTREPRENEURSHIP PROGRAMME (STEP)

With entrepreneurship and innovation projected to be key drivers of Singapore's future economic restructuring, growth and development, the STEP integrated programme aims to nurture a new generation of technically-grounded entrepreneurial leaders and innovators. STEP graduates will receive a Bachelor of Engineering/Science and a Master of Science in Technology Entrepreneurship at the end of the 4.5 year or 10-term programme.

The first six terms (or first three academic years) of STEP is similar to SUTD's undergraduate programme and students can opt to take a degree in any of the four pillars - Architecture and Sustainable Design, Engineering Product Development, Engineering Systems and Design or Information Systems Technology and Design.

In the fourth year, STEP students will spend the first term in the US pursuing entrepreneurship courses in the University of California, Berkeley, followed by a four-month work immersion in the Bay Area, and another term in a Chinese University such as Zhejiang University, where they will take entrepreneurship and management courses in China.

For the undergraduate final year, students return to SUTD to fulfill a unique Technology Entrepreneurship Capstone Project with an individual Masters level dissertation. These capstone projects require the students to start with a technology-based idea, bring it through a start-up process and introduce the product to the market place. The capstone team members comprise students from at least two different pillars who are in the STEP, so that they can each contribute their respective expertise to solve complex multi-disciplinary challenges.

STEP graduates will be equipped with fundamental technology skillsets, and yet be sensitive to global technological trends and developments. They will have the ability to capitalise on these developments and create new technology-intensive businesses or ventures which could potentially disrupt the market. Should STEP graduates prefer to enter the local workforce, they could find employment in the various industry sectors similar to SUTD graduates, and can act as intrapreneurs within their employing organisations, enabling the creation of new business solutions.

STEP

- Integrated programme where students graduate with a Bachelor of Engineering /Science and a Master of Science in Technology Entrepreneurship
- 4.5 years or 10 terms
- One year overseas experience in US and China which comprise:

  i) One term pursuing entrepreneurship courses at UC Berkeley.

  ii) An exclusive work immersion in San Francisco Bay Area.

  iii) One term pursuing entrepreneurship and management courses in a Chinese University.
- Unique Technology Entrepreneurship capstone project.
- Masters dissertation on Technology Entrepreneurship.

MASTER OF SCIENCE IN SECURITY BY DESIGN (MSSD)

The MSSD is a postgraduate programme catered to graduates with an engineering, computer science or information technology background. It offers in-depth education in cybersecurity using SUTD's signature approach of active learning with a focus on design.

MSSD will equip students with the necessary skills to design secured systems in a diverse group of organisations as well as analyse the security and privacy levels of existing systems. Students in the programme will have ready access to SUTD's facilities in cyber physical systems including the testbeds for secure water treatment, water distribution, power grid and the Internet of Things. These testbeds would provide practical training, application and hacking opportunities in critical networks and infrastructure.

Classes will be conducted in the evenings to enable a broad section of students to benefit from the programme. To graduate, students are required to pass four core subjects and two electives, attend mandatory seminars, participate in security tools laboratory sessions and complete an industry project or research thesis. Students can also participate in international internship and research opportunities with overseas academic partners, such as Delft University of Technology, Netherlands, for a term.

The first batch of MSSD students will enter SUTD in September 2017.

MSSD

- Postgraduate programme
- One year (full-time) or two year (part-time)
- Participate in international internship and research opportunities with overseas academic partners
- Ready access to SUTD's testbed facilities in cyber physical systems, providing practical training, application and hacking opportunities in critical networks and infrastructure

SUTD PARTNERS WITH SIX VENTURE CAPITALISTS TO NURTURE START-UPS

From left to right: Mr Lee Kwai Seng (Managing Director, RIA Venture Capital); Mr David Lim (Managing Director, Raffles Venture Partners); Mr Shobhit Agrawal (Finance & Operations Head, Velocity Accelerator); Prof Chong Tow Chong (Provost, SUTD); Mr Lester Chan (CEO, Fund Singapore/ Managing Director, BeaconRock Investments); Mr Daniel Lin (Executive Director, FundedHere)

The Singapore University of Technology and Design (SUTD) signed an MOU with six venture capitalists on 26 May 2017. The partnerships aim to boost SUTD's entrepreneurial ecosystem and nurture local start-ups.

The six partners are (in alphabetical order):

- **BeaconRock:** A company that focuses on financial management consultation, and private equity and venture capital related deals.
- **FundedHere:** A crowdfunding platform that connects investors to start-ups in Asia.
- **Fund Singapore:** A business of equity and debt crowdfunding platform for Singapore startups.
- **Raffles Venture Partners:** A venture capitalist that provides support to potential start-ups, in terms of investment, co-working space and mentorship.
- **RIA:** An organisation that works with start-ups through their various stages of growth. They run the AIRmaker suite of programs, including corporate innovation programmes, an IoT-focused (Internet of Things) accelerator – Digital Health and Smart Urban Solutions sector, and a scaling programme for later stage start-ups.
- **Velocity:** A business acceleration programme based in Singapore and supported by ACP Pte Ltd (a Registered Fund Management company with MAS and has an Accredited Business Angel status under the SPRING Seeds Capital Business Angel Scheme).

SUTD is always looking for ways to improve and provide more resources to students who are aspiring entrepreneurs. The collaboration with the six partners, will provide more opportunities for students to receive support from potential investors and mentorship from the industry, with special focus in areas such as HealthTech, FinTech, EduTech, Big Data technology, Internet of Things, to name a few.

Under the MOU, SUTD students and start-ups will have the opportunity to interact with these partners through entrepreneurship-related activities, such as StartUp Fiesta, SUTD 10K Challenge, Create4Good, Startup Pitch Day, StartSomething@SUTD, etc. The partners will also establish a work placement programme for selected SUTD students as well as mentor promising start-ups.

NEW COURSE TO SPECULATE SINGAPORE'S FUTURE

BY NAZRY BAHRAWI

The mark of an ideal city lies in its ability to innovate. This is, arguably, one of the primary thrusts of literary texts imagining urban utopias. For instance, denizens of Thomas More's ideal city in his classical text *Utopia (1516)* were depicted as being open to assisted dying, or euthanasia, at a time when such matters were considered taboo and sinful. Innovation has become a buzzword for Singapore, often hailed as a 'model' city for its astounding transition from third world to first within a generation. This fascination is tied to the bigger question – what will the future hold?

With Singapore crossing its 50-year mark as an independent nation-state last year, it has become imperative to speculate the next 50. The new nationwide module 'Singapore: Imagining the Next 50 years', which was launched in February 2017, attempts to provide some clues. The course resulted from a collaborative effort among all six autonomous universities here. Lessons are curated as hour-long videos covering the following six major themes:

- Singapore in the World (Singapore Management University)
- Population (National University of Singapore)
- Economy (Singapore University of Social Sciences, formerly UniSIM)
- Security and Threats (Nanyang Technological University)
- Social Integration (Singapore Institute of Technology)
- Aspirations and Identity (Singapore University of Technology and Design)

As the SUTD representative for this module, I had curated the videos along the theme of 'Aspirations and Identity' through narratives about the 'ideal' Singapore from the perspectives of policymakers and ordinary citizens. Featuring interviews with Singaporeans of all walks of life, it appraises the golden jubilee SG50 initiative through academic discourses about utopia and nationalism, and considers governmental aspirations for a better Singapore in the fields of education and heritage. It will also devote some attention to the practice and ideal of Singapore's multiculturalism, which signals the transitional nature of this city-state.

While some universities are offering the module in its entirety, SUTD has taken the unique approach of pegging the videos on to its two common core modules offered by the Humanities, Arts and Social Sciences (HASS) cluster. These are W*orld Texts and Interpretation* (02.001) and *Theorising Society, the Self and Culture* (02.003).

True to SUTD's interdisciplinary pedagogy, this means that students might get to explore Singapore's foreign policies in light of principles of good governance contained in *The Analects*, or the city's state of multiculturalism from the prism of communal living in the classical Islamic text, *Hayy ibn Yaqzan*.

HIGH EMPLOYMENT RATE AND STARTING SALARIES FOR SUTD'S SECOND BATCH

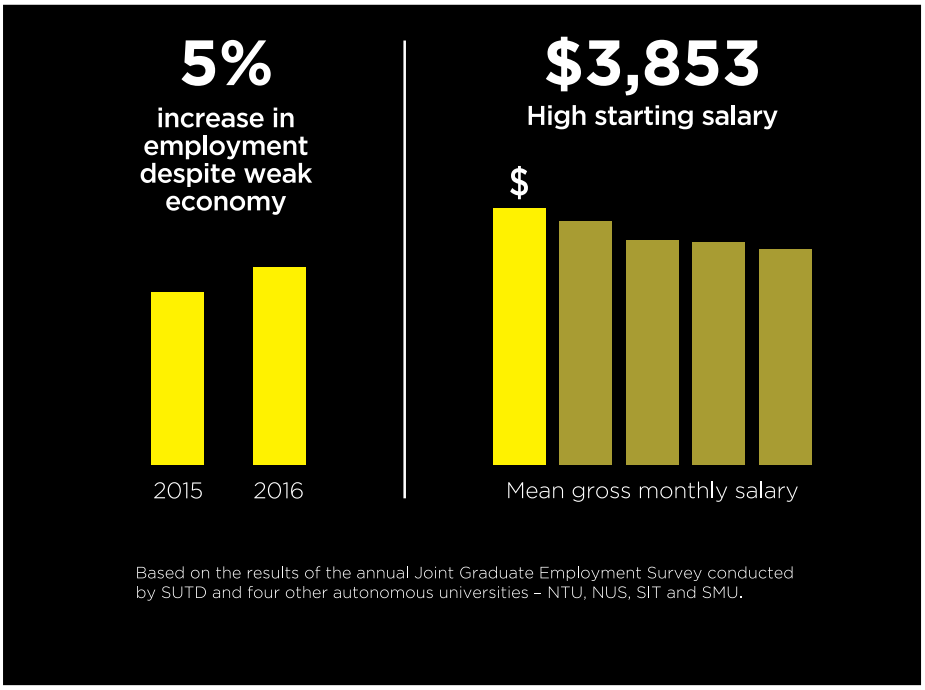


Figure shows increase in employment numbers and high starting salaries for the second batch of SUTD graduates

SUTD's second batch of graduates continues to be well-received by industry with high overall employment rates and starting salaries in 2016 based on the results of the annual Joint Graduate Employment Survey.

The survey revealed that more than nine out of 10 of the fresh graduates were employed within six months of completing their final examinations, with full-time permanent employment rate for engineering graduates having increased from 80.7% in 2015 to 86.1% in 2016. Some of the top hiring sectors include Information & Communication, Engineering Manufacturing, Financial & Insurance, and Public Administration & Defence.

The mean gross monthly salary for fresh graduates employed in full-time permanent employment increased by $144 to $3,853 in 2016, compared to 2015. The median gross monthly salary for fresh graduates employed in full-time permanent employment increased by $50 to $3,650 in 2016, compared to 2015.

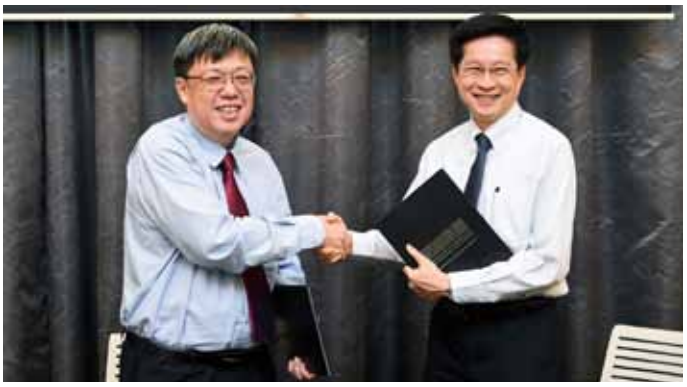
Professor Thomas Magnanti, SUTD's President, said: "Despite challenging economic conditions, we are heartened that there continues to be strong demand for our technology- and design-trained students, and their high starting salaries show that employers value what our students can bring to the table. We believe that our second batch has reaffirmed the positive experiences that industry had with our first batch of graduates. Armed with SUTD's unique multi-disciplinary design-centric education that brings together innovation and problem-solving skills, our students are well-prepared for the jobs of tomorrow."

"The SUTD graduates who joined CAG have performed beyond expectations. They demonstrate three distinct qualities. First, they are eager to learn, and take in advice from colleagues before developing solutions. Second, they are able to collaborate with colleagues across the entire value chain, and third, after creating solutions, they enable others to execute them. These qualities put them in good stead to deal with complex issues," said Mr Yam Kum Weng, Executive Vice President of Airport Development, Changi Airport Group (CAG), one of 700 companies that collaborate with SUTD on internships and employment.

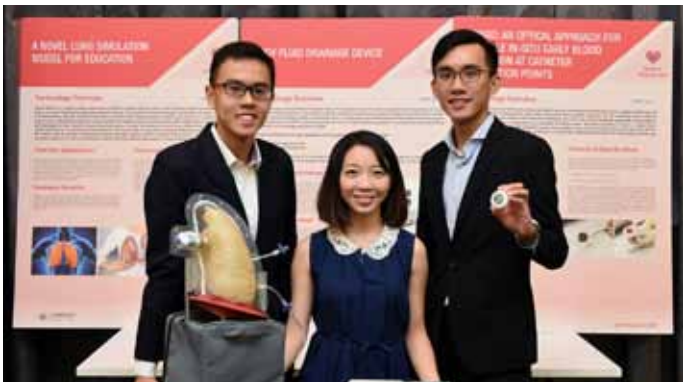
Engineering Systems and Design graduate, Aditya Singh, who is a system analyst at Medtech Global, said: "I thought that I would be an underdog being a graduate from a new university. However, on the contrary, people judge us according to our abilities regardless of where we come from. SUTD has taught us the ability to absorb information fast and deliver work on time. That is the edge that we need to pivot on. SUTD has provided the fundamentals and proper framework required to launch me into the working world."

Angel Chia Jing Wen is an Engineering Product Development graduate who is now working as a researcher at DSO National Laboratories. A lot of innovative project-based work that she is involved in requires collaboration and knowledge-sharing among engineers and scientists of all fields. Angel said: "SUTD's multi-disciplinary approach prepared me to work effectively in a team setting, while its broad based education has helped me to learn more - through better appreciation of different ideas and concepts."

SUTD EXTENDS COLLABORATION WITH EHA FOR ANOTHER FIVE YEARS



From left to right: Dr Lee Chien, Group CEO of EHA, Prof Chong Tow Chong, Provost of SUTD



Under the first MOU, three patents have been filed from the internships, capstone projects and proposals funded by the HealthTech Innovation Fund. From left to right: Student representatives – Chin Joon Keat, Joanne Tan Huishan and Ching Tsz Him

As healthcare needs continue to evolve, healthcare engineering is an emerging field that aims to incorporate technology into various aspects of healthcare services. With Singapore's ageing population, the demand for more of such engineers will likely grow in the near future.

The renewal of our partnership with Eastern Health Alliance (EHA) for another five years not only allows us to build on what we have achieved, but some key aspects of the alliance include nurturing future generations of healthcare engineers and cultivating healthcare innovation in Singapore.

To promote talent development in this sector, EHA and SUTD will co-develop new modules to provide students with a robust overview of Singapore's healthcare landscape and innovation opportunities in healthcare engineering. Students will have the opportunity to work alongside healthcare professionals and researchers to gain valuable clinical and industry insights. By immersing themselves within clinical environments, students can also observe procedures and medical devices to discover unmet clinical needs. From there, they can then work on transforming their ideas to solve these unmet needs into feasible medical devices that can be commercialised and deployed in clinical environments.

The first partnership with EHA, which began in 2013, funded 13 projects to the value of S$2.2 million and yielded three patents:

- **Body Fluid Drainage Device**
  This drainage device automates the process of draining abnormal collections of fluid from body cavities. By allowing pre-selection of volume and rate, it minimises human intervention and results in higher quality patient care and safety in the process. It is also designed for comfort and mobility, and can be used in both inpatient and outpatient settings. The system addresses current technology gaps in body fluid drainage. It enhances safety and efficiency in drainage procedures through controlled and precise measurements.

- **Lung Simulation Model for Education**
  The lung simulation model simulates diaphragmatic contractions and different pleural pressures to train medical personnel. By providing a realistic representation of the human lung, this model omits reliance on static models, mannequins and animal lungs for training to improve training outcomes and enhance clinical skills.

- **BWard Real-time Blood Sensing and Wound Monitoring Device**
  BWard is a sensing, monitoring and alerting device that detects active re-bleeding at the site of venous catheter extraction. The device differentiates blood from other bodily fluids and provides continuous monitoring for bleeding in patients who have undergone surgery or who have suffered traumatic injury. It can also be used to monitor for bleeding or disconnected tubing during hemodialysis. The use of BWard enhances the process of regular inspection and allows medical staff to attend to more urgent medical needs.

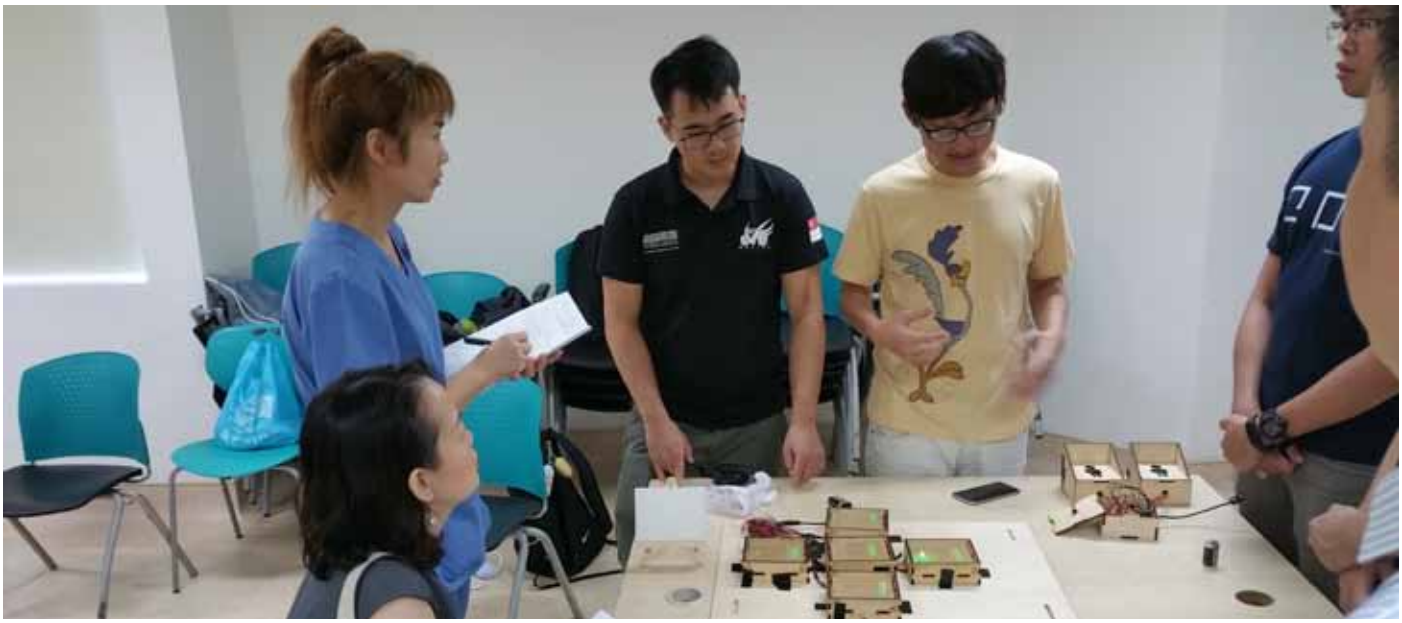
GLOBAL HEALTH TECHNOLOGIES

Students explaining how the pressure relief and notification system works

The Global Health Technologies module is an extension of the SUTD and EHA collaboration, where students are educated on using technology to come up with innovative healthcare solutions. This year, final year students taking the Global Health Technologies course worked with healthcare professionals from St. Andrew's Community Hospital to understand the problems faced in elder care. The students then applied the concepts of the Biodesign innovation process to problems faced by elderly patients to come up with possible solutions.

Here are some of the potential solutions the students proposed:

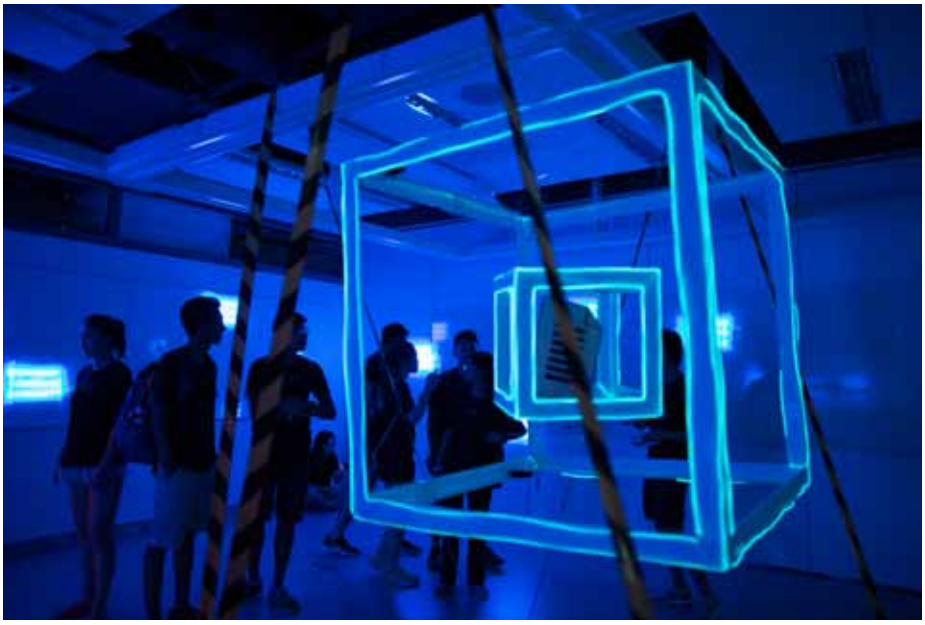
- **Pressure relief and notification system** is a method to decrease the incidence of pressure ulcers in elderlies' casts to reduce hospital stays. SUTD students came up with two prototypes: one is an active prototype which rotates the affected leg in a slow cyclical motion to redistribute and prevent buildup of sustained pressure without the need for manual intervention; the second is a passive prototype which uses pressure sensors to detect pressure at crucial areas where sores may occur. A vibration at regular intervals will alert patients to move their legs to reduce pressure there.
- **Customised DDR Board** was inspired by the popular arcade game 'Dance Dance Revolution'. This game is catered to senior folks to encourage them to exercise their upper bodies. There are five buttons on the DDR Board that would light up in a random sequence, and the elderly is tasked to press on the lighted buttons. These random movements and stretching activity helps the elderly to work out their upper body and arms without the constant attention of the therapist or caregiver.



Students demonstrating the customised DDR Board to St. Andrew's Community Hospital clinicians

SUTD ORIENTATION 2017

BY STEVEN WILLIAMS



Puzzle solving during the Night Walk

The SUTD campus sprung to life when over 400 new students showed up for the Freshmen Orientation Camp. The camp, held from 11 to 13 May, was preceded by the Matriculation Day on 9 May, where camp leaders brought the freshmore students to complete various administrative processes as well as go through a series of preparatory talks. The orientation camp was designed to welcome and integrate the freshmen into the SUTD family through bonding activities, which included a cheering competition, mass dance and wet games among others.

The highlights of this year's Orientation are Zurvival and Night Walk. Zurvival was a game that simulated an apocalyptic setting where a virus outbreak had caused the dead to rise again as zombies. The purpose of the Zurvival game was to allow freshmen to get to know the campus in a fun and interactive way.

Led by the Orientation group leaders, the freshmen travelled in packs across Buildings 1 and 2 to retrieve hidden syringes containing antidotes, in their fight against the zombies. Despite being a physically demanding activity, many freshmen gave feedback that Zurvival was one of the most immersive orientation games.

One of the zombies of Zurvival

Boasting four different rooms that represent the four academic pillars of SUTD, Night Walk was an impressive feat, which fully demonstrated the amazing creativity of SUTD students. With the aid of handmade 3D shapes from cardboard and plastic boards lighted up with electro-luminescent wires, ordinary classrooms were transformed into fascinating futuristic backdrops. The games in the rooms ranged from a memory game to puzzle solving to answering riddles in order to find an exit from the maze. These game rooms helped introduce the main essence of SUTD's four pillars to the freshmen.

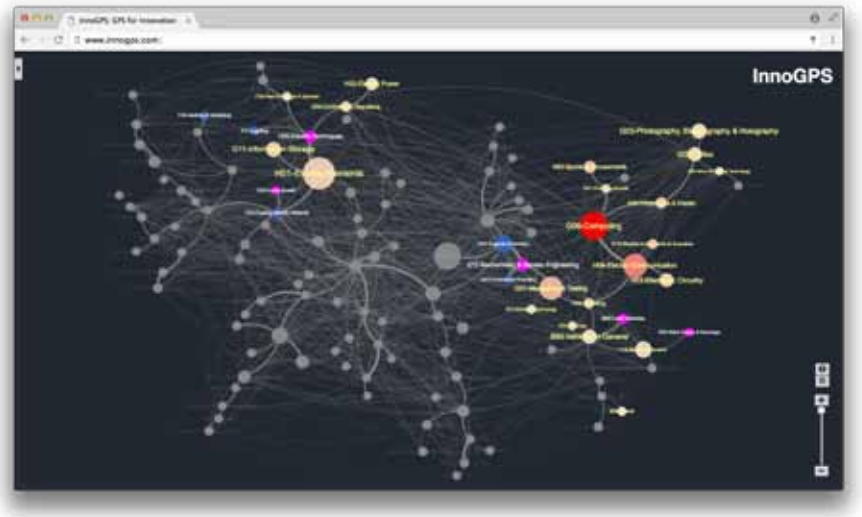
Concert featuring SUTD's student-formed bands

The three-day programme concluded with a blast as all the freshmen gathered in the SUTD multi-purpose hall for a concert that featured SUTD's very own student-formed bands, "The Leftovers" and "Python". As soon as the lights were turned off and the first band started performing, the large venue suddenly became small as the crowd started shouting and jumping up and down. However, before everyone knew it, the concert came to an end. To mark the end of the camp, the orientation project director, Bharat Kareti, gave a closing speech. For the freshmen, however, this marked the very beginning of their SUTD journey.

INNOGPS - A GPS FOR INNOVATION

BY JIANXI LUO

The InnoGPS™ is a data-driven interactive visualisation technology that will empower engineers, companies and governments in search of emerging technologies, innovation opportunities and pathways. Inspired by the traditional global positioning system (GPS) used in geographical navigation, InnoGPS integrates an empirical map of all known technologies and various data-driven analytics and visualisation functions for navigation, positioning and path-finding in the technology space. As a computer ideation aid, it can provide artificial intelligence to enhance the previously intuitive human process of conceiving innovation opportunities and generating new design ideas.



Main Interface of InnoGPS - www.innogps.com

InnoGPS changes the qualitative and intuitive traditions that people use to conceive their next innovation opportunities to a more data-driven, scientifically-guided and visually-informed fashion. For individual engineers and researchers, InnoGPS can be used as an ideation tool to guide and inspire them to come up with out-of-the-box design ideas and new design opportunities.

Start-ups and small medium enterprises (SMEs) that are inexperienced in innovation may use InnoGPS to reduce the uncertainty in formulating their next product lines beyond existing ones, for pivoting, growth and diversification. Large companies, R&D centres and government agencies can use InnoGPS to assess their technology positions in comparison to that of their collaborators and competitors, and automatically generate data-driven technology road maps. In fact, a line-up of global companies, R&D organisations, SMEs and start-ups have already signed up to use InnoGPS online.

InnoGPS is the first of its kind technology. Its inspiration and development is deeply rooted in SUTD's integrated multi-disciplinary research culture. InnoGPS is grounded in data science, network science, design science and interactive digital visualisation research at the SUTD Data-Driven Innovation Lab. The research and development of InnoGPS has yielded a dozen publications, one international patent, a best poster award from the International Conference on Complex Systems and the SG Design Mark Special Mention for a Research Project award.

SUTD 10K CHALLENGE

BY ONG JUN SHENG

Winning team WHYRE

The finale of the second SUTD 10K Business Innovation Challenge was held in SUTD on 28 April 2017. Designed to be a platform for aspiring entrepreneurs and problem-solvers to learn by experience, participants from more than 20 teams ideated, brainstormed and wrote preliminary business plans over a two-month period.

Ten teams entered the semi-finals based on the quality of their business ideas and preliminary business plans. Under the guidance of their mentors, the semi-finalists prepared investor-worthy business plans and pitches. They were then put to the test in the semi-final qualifying round, where they had to pitch their ideas to a panel of judges who are veterans in the start-up scene.

Emerging from the semi-finals, the five best teams continued to refine their business ideas and pitches for the finale. The finalists impressed the room of enthusiastic audience with their passionate pitches and astounding product and prototype demonstrations.

The winner of the Challenge was WHYRE, the team behind Omni, a smart helmet that increases the situational and spatial awareness of riders. Omni uses an augmented reality display to provide information to riders, empowering them to ride more defensively on the road. For example, a video feed of the rear can be displayed, alerting riders to potential rear-end collisions. The judges were impressed by the amount of research the team had done, their in-depth understanding of the problem and their innovative solution.

Mobearlize, the team behind a modular motor controller for wheelchairs dubbed EMMA, received honourable mention from the judges as well for having identified the salient problem of wheelchair manoeuvrability and the elegance of their proposed solution.

Of the Challenge, one of the judges, Mr Lee Kwai Seng, managing director of AIRmaker said: "I am very pleased to see the energy and drive from each of the participants. Start-ups with good potential should build on this momentum to find success in growing their businesses."

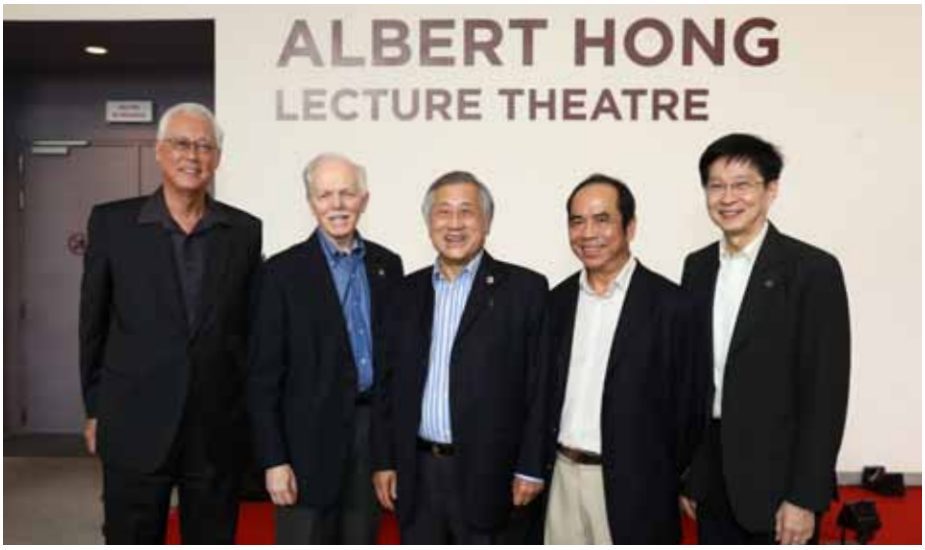
SUTD'S LARGEST LECTURE THEATRE NAMED AFTER DR ALBERT HONG

SUTD named its largest lecture theatre (LT1) after renowned Singaporean architect, Dr Albert Hong, in appreciation for his generous $30 million gift to the university in 2013. This donation was pledged as part of SUTD's fundraising campaign to commemorate Singapore's Founding Prime Minister (the late) Mr Lee Kuan Yew's 90th birthday that year.

Dr Albert Hong said: "I congratulate SUTD for its outstanding work in developing a world-class university and a very promising next generation of holistically trained and technically-grounded architects and engineers. Education is dear to my heart. It empowers people and is capable of uplifting society. Back in 2013, I pledged this unrestricted gift to SUTD and wanted them to make good use of it. My aim is straightforward – to help the underprivileged receive the education they deserve. No deserving students should be denied formal education because of lack of financial support. All I ask is for the students to serve the country after graduation, and give back as they have so richly received."

During the dedication ceremony that was officiated by Emeritus Senior Minister Mr Goh Chok Tong, SUTD's Patron for Advancement, Mr Goh shared some heart-warming details about Dr Hong's life and the events that led him to give away most of his wealth to worthy causes, such as education.

Not only has Dr Hong's gift helped defray study costs for many deserving students who are keen to pursue a unique multi-disciplinary, hands-on education at SUTD, but it has also provided important resources to prepare and enable students to become future-ready leaders of Singapore.



From left to right, Emeritus Senior Minister Mr Goh Chok Tong, SUTD President Prof Thomas Magnanti, Dr Albert Hong, SUTD Board of Trustee, Mr Sam Goi and SUTD Provost Prof Chong Tow Chong

SUTD Provost, Professor Chong Tow Chong, said: "SUTD is proud to name our lecture theatre after Dr Albert Hong, one of Singapore's most distinguished and highly respected architects. We are very grateful to Dr Hong for his generous support, which will help nurture innovative and technically-grounded graduates who will go on to shape the future through technology and design. Dr Hong's patronage attests to his confidence in the quality and rigour of our multi-disciplinary programmes, cutting across our architecture and engineering pillars. We share his desire in ensuring equal opportunity is given to every student, irrespective of financial circumstance and we hope Dr Hong's influence will inspire many more to pursue a first-rate education with us."

In addition, SUTD will establish the Albert Hong Lecture Series under the Architecture and Sustainable Design (ASD) pillar, to stimulate discussions and broaden intellectual capacity among students, faculty and experts about topics of interest and importance to society.

SUTD'S ASST PROF NAGARAJAN RAGHAVAN RECEIVES THE IEEE EDS EARLY CAREER AWARD

Asst Prof Nagarajan Raghavan

Each year, only one candidate is awarded the global Early Career Award by the Electron Devices Society (EDS) and in 2016, SUTD's Asst Prof Nagarajan Raghavan ("Naga") was chosen to receive this prestigious award.

The Early Career Award is usually bestowed on a "Young Scientist" for his or her contributions to research in the field of semi-conductors. The criteria for the award selection process includes publication track records in IEEE (Institute of Electrical and Electronics Engineers) based journals, service to the IEEE society and research impact to the field over a period spanning the last 10 years of the applicant's career since graduation.

Dr Naga has published close to 120 papers in peer reviewed international conferences and journals with an H-Index of 18. He had received the IEEE PhD Student Fellowship Award as well from EDS five years ago. His key research contributions for this award included lifetime prediction models for high-K metal gate transistors, variability modelling of non-volatile memory devices and prognostics and health management for electronic devices and systems.

Naga has been an active volunteer with several IEEE conferences and is currently the Technical Programme Organising Chair for International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA) 2017 in Chengdu and IPFA 2018 in Singapore. He has recently expanded his research into new areas including additive manufacturing, analytics driven nanostructure growth optimisation and predictive analytics of autonomous vehicles.

ICONIC VOICES FROM MIT LECTURE - THE CONVERGENCE OF BIOLOGY AND ENGINEERING BY DR SUSAN HOCKFIELD

BY NURUL MARSYA

Dr Susan Hockfield, President Emerita of MIT, spoke on 'The Convergence of Biology and Engineering' at SUTD as part of the Iconic Voices from MIT Lecture Series

As part of the Iconic Voices from MIT lecture series, SUTD invited esteemed President Emerita of MIT, Dr Susan Hockfield, to give a talk on the convergence of Biology and Engineering. The short 45-minute but extremely informative lecture by Dr Hockfield, a noted neuroscientist and MIT's first female president, was both candid and inspiring. Topics covered ranged from the history of science to her life experiences and that of previous MIT presidents.

Dr Hockfield opened the talk by sharing with us that research is an inefficient process yet it is the only known route to discovery. As the president of MIT, one of the challenges was having the foresight to lay the necessary foundation for the future. The returns on any investment in research and education are never immediate, making it a difficult but necessary road to take.

One example she cited was the discovery of electromagnetism. At the time of discovery, Michael Faraday did not know the benefit of his discovery, except that there was always a possibility for the government to tax it. Only with the convergence of physics, engineering and the course of time was the potential of such a discovery fully realised as reflected in our daily lives today.

Dr Hockfield also shared that the convergence of biology and engineering was nothing new, sharing that some researchers in the early 1900s recognised the power of combining biology and engineering. Some recent ground-breaking ideas that arose from converging the two include the use of viruses to generate power, a relatively viable solution in comparison to solar and wind energy.

Overall, not only was Dr Hockfield successful in covering a wide range of scientific topics in a manner that was easily understood by people of different educational background and disciplines, but her candid sharing of her childhood essay of being a scientist was also able to keep the entire audience engaged, making it enjoyable for both students and external guests alike.

GLOBAL YOUNG SCIENTIST SUMMIT 2017 - LECTURE BY TURING AWARD WINNER, PROF BARBARA LISKOV

BY ANUSHKA PAKHALE

As a female student, I cannot help but occasionally feel overwhelmed by the sheer majority of men in my field of study – Information Systems Technology and Design. Hence, it was gratifying to learn first-hand from a woman who has been a forerunner in computer science. I was very excited when Professor Barbara Liskov, Turing Award winner, gave a public lecture at SUTD in January. Her talk was entitled 'The Power of Abstraction', a concept which is very much at the centre of many works in computer science. It encompasses finding the right interface for a system as well as finding an effective design for a system implementation.

Prof Liskov was one of the first people in the United States to obtain a PhD in Computer Science and her work has heavily influenced breakthroughs in areas such as operating systems, distributed systems, programming languages and programming methodology. Her simple lecture slides, a no-fuss classic MS Office 2003 template with no more than three-bullet points each, made it a breeze to understand complex concepts, and more importantly, drew the audience to remain rapt to her lecture as she discussed the 'past, present and future of abstraction'. She shared how the abstraction mechanisms used today came to be, how they are supported in programming languages, and some possible areas for future research.

Turing Award Winner Prof Barbara Liskov gave a lecture titled 'The Power of Abstraction' at SUTD

Through her ground-breaking work in computer science, a mostly male-dominated field, I can safely say that I have found Prof Liskov to be an inspiration as a computer engineer, a leader and a woman.

FUSION - THE POTENTIAL OF TECHNOLOGY AND DESIGN

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