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## FUSION

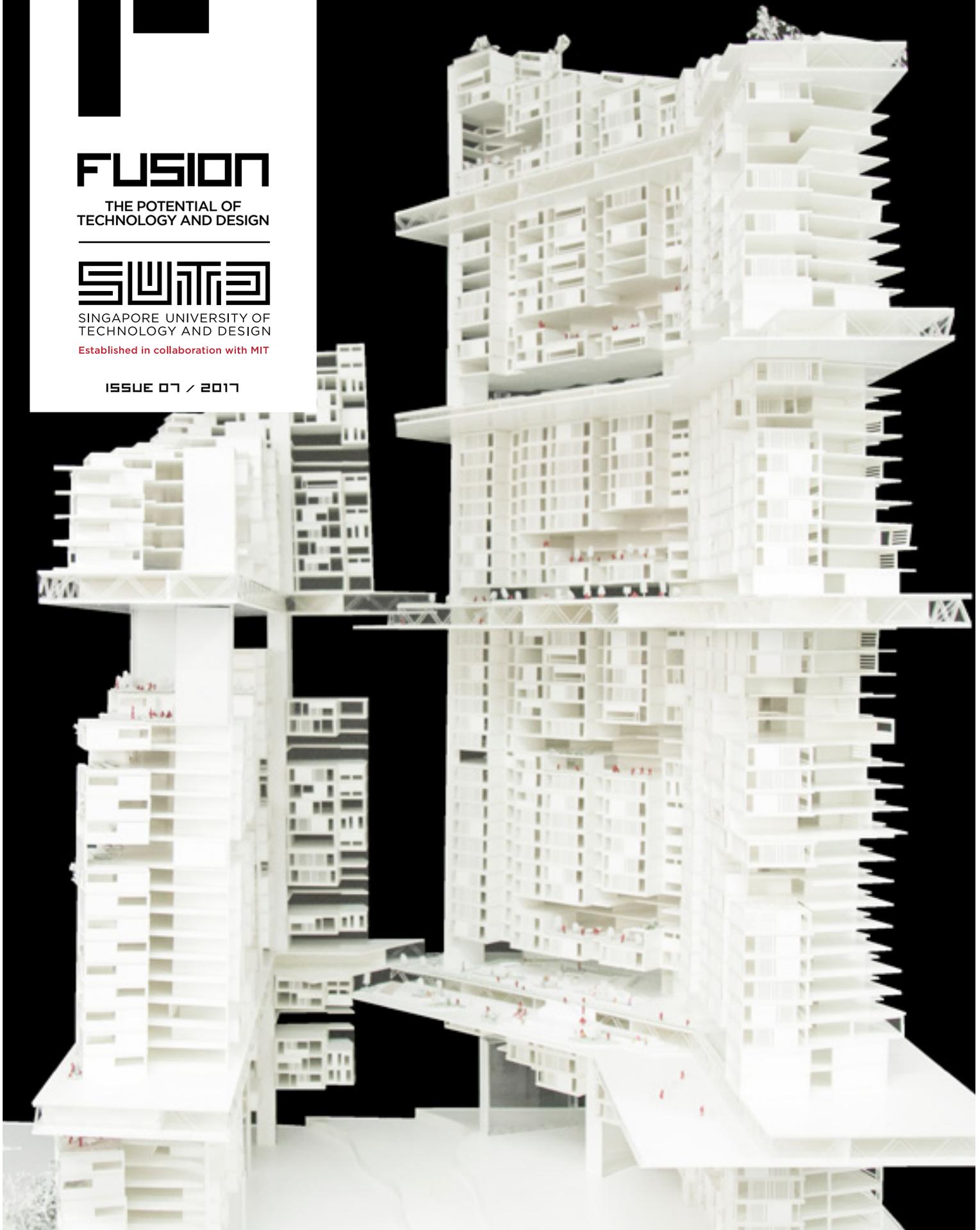
THE POTENTIAL OF  
TECHNOLOGY AND DESIGN

### SUTD

SINGAPORE UNIVERSITY OF  
TECHNOLOGY AND DESIGN

Established in collaboration with MIT

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# FIRST BATCH OF MASTER OF ARCHITECTURE STUDENTS GRADUATE

Time flies and we have just celebrated the graduation of our second batch of undergraduates in September 2016. However, this year is special, as it is the graduation of our pioneer batch of Master of Architecture students.

Due to the larger number of graduates, two graduation ceremonies were held, with Singapore President and SUTD Chancellor Tony Tan Keng Yam presiding over the first, and Acting Minister for Education (Higher Education & Skills) Ong Ye Kung presiding over the second.

One of the key messages from Minister Ong Ye Kung's commencement speech were:



MOE Minister Ong Ye Kung speaking to the SUTD graduates

***“Singapore is a small country and every one of our university is a national university. QS or Times are rankings with criteria developed by commercial companies and need not necessarily reflect our national priorities.”***



Group picture with Singapore President & SUTD Chancellor Tony Tan in the centre

***“As a small university, even without ranking, you can do very well and become an outstanding institution for Singapore. One of the important measurements, for students especially, is the employment outcomes – are you able to find good jobs? And you have.”***

*“A few days ago, QS published university rankings. SUTD was not on the rankings. However, we must remember that ranking is not the be all and end all. In the same way as we always explained to students, your grades are not the be all and end all. Singapore is a small country and everyone of our university is a national university. QS or Times are rankings with criteria developed by commercial companies and need not necessarily reflect our national priorities. Before this ceremony, we all stood up to sing the National Anthem, because this is a university in Singapore and all universities in Singapore are national universities, and we all have our national objectives. The universities need not have a good ranking in order to discharge their responsibility as a national university. Conversely, a university can have a good ranking, but yet not be a good university for Singapore. As a small university, even without ranking, you can do very well and become an outstanding institution for Singapore. One of the important measurements, for students especially, is the employment outcomes – are you able to find good jobs? And you have.”*

71 masters and 246 undergraduate students received their degrees that day, with more than 70% of undergraduates having secured jobs prior to graduating or will be pursuing further studies in top institutions around the world.

62 of the Masters graduates were from SUTD's first batch of undergraduates in



the Architecture and Sustainable Design pillar who had continued to pursue their Master of Architecture at SUTD. The one-year Master of Architecture programme required the students to work on sustainable studio projects and specialised electives, complete a 16-week industry internship and create a research-based thesis with real-life relevance to provide design solutions for today's world.

26-year old Eugene Lim, who received a return job offer from his internship company, said: "I chose to do my Master of Architecture at SUTD because I wanted the combined exposure in technology and design as I believe that's what sets the SUTD education apart from other architectural degree programmes." Eugene shared that while interning at Surbana Jurong, he was involved in a joint project with Flux, a Google spin-off that develops software for architects and engineers to design buildings and cities of the future, where he was able to help bridge the gap between the computer scientist and the architect due to the technical programming and coding skills he had picked up at SUTD.

***"I chose to do my Master of Architecture at SUTD because I wanted the combined exposure in technology and design as I believe that's what sets the SUTD education apart from other architectural degree programmes."***



# THE ARCHITECTURE AND SUSTAINABLE DESIGN GRADUATE SHOW

SUTD's first batch of Master of Architecture students graduated this year and together with the Bachelor of Science, Architecture and Sustainable Design (ASD) graduates and faculty, they presented an exhibition named "Transform". Held from 3 to 15 October 2016 at the National Design Centre, the exhibition showcased the unique focus of the ASD pillar - to nurture a new breed of technically-grounded architects capable of designing a better and sustainable built environment for tomorrow.

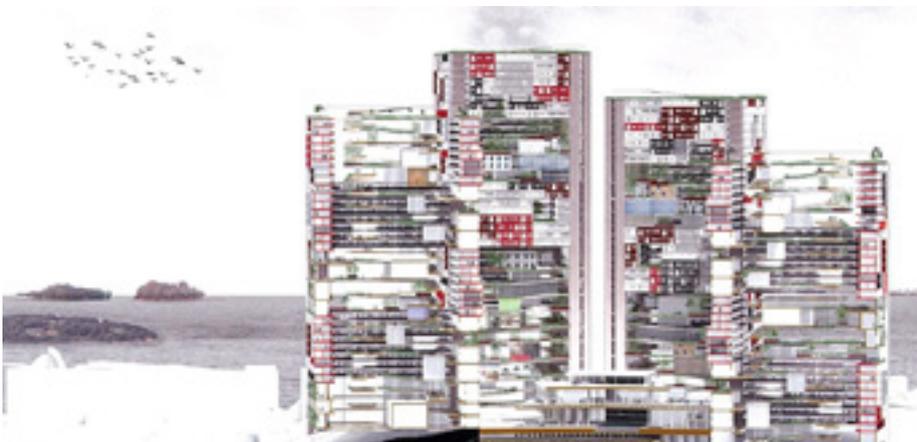
The theme "Transform" is a call to action. With the evolution of mankind and technology, change has become second nature and adaptation is our best friend. The ability and insight to metamorphosis is increasingly valuable. The idea and belief of transformation is constantly challenged in the climate of architecture today.

The graduation works show the students and faculty facing continuous transformations amidst globalisation, migration, virtual platforms, new technologies, new urban terms of equilibrium, new strategic development

plans, new resources and new demands. These are also fundamental issues architects today face in a professional and social context, in their working methods and attempts at offering design solutions to existing conditions.

The projects showcased at the ASD Graduate Show strove to create a synergy of the various aspects of human existence, be it social, economic, ecological, aesthetics; together with sustainability and quality. They are also very much a personification of the multi-disciplinary nature of an SUTD education.

## PROJECT HIGHLIGHTS



*Hyper-Dense Hybrid by Clifford Mario Kosasih*

### **Theme Hyperdensity - Hyper-Dense Hybrid**

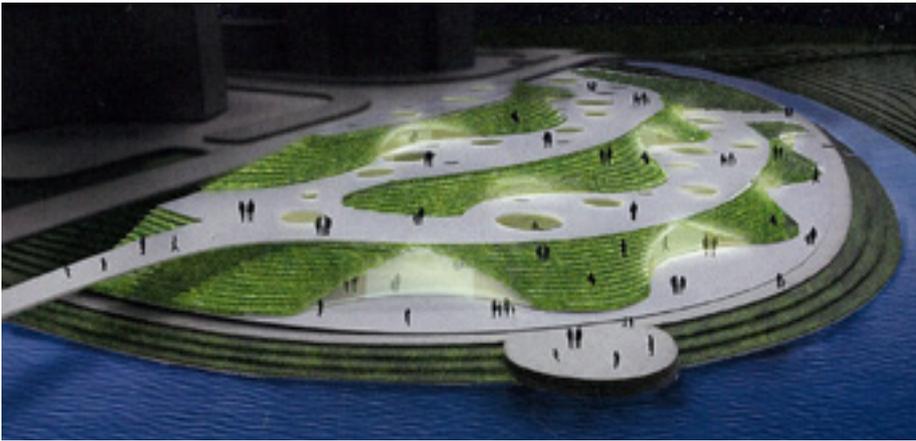
To incorporate Singapore's aim of 6.9 million people by 2030, this project aims to achieve a hyper-dense architecture that also integrates diverse functions of the community.



*Food Kampong 2050 by Lina Fong*

### **Theme Hyperdensity - Food Kampong 2050**

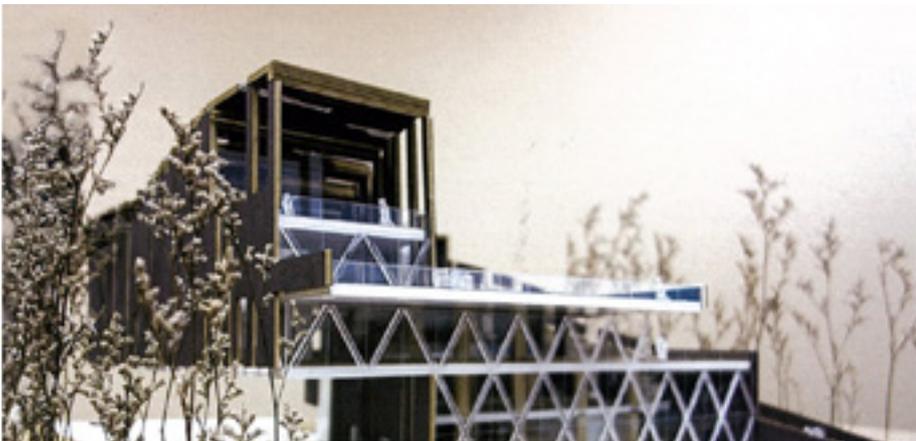
The Food Kampong 2050 aims towards being a self-sufficient vertical urban community in Singapore that uses food as a 're-connector'. The community embraces density while promoting diversity through actively involving them in their food production and consumption cycle.



CommunityScope by Beryl Tare

**Theme Adaptation – CommunityScope**

CommunityScope draws from theories of social interaction, using community centres as avenues for such interactions in order to build social cohesion. It depicts how future community centres may look like, with myriad programmes for all members of the local populace woven into the landscape.



The Volunteering Campus by Mak le Ting Amanda

**Theme Shifting Demographics – Volunteering Campus**

This thesis recognises and caters for two key communities: those who are active in the volunteering scene and the potential volunteers. It aims to be a meeting point for both groups, a destination that is a public space and a volunteering hub with facilities that support ground-up volunteerism

**DBS OPENS DIGITAL BANK BRANCH IN SUTD**

The public and businesses in the Changi Business district with banking needs need worry no more as local bank, DBS, has opened a new digital bank branch in the SUTD campus. 18 pioneer SUTD students from three Capstone (final year) project teams contributed to the design concepts adopted by DBS in this bank branch.

Among the design ideas that the student teams proposed, the levelled bench for the customer waiting area was adopted. The idea behind this was to provide a seating area for small-scale student-led presentations or community seminars. Another feature that was adopted is the use of mobile panels that allows the set-up of different space configurations for various activities.

SUTD is thankful to DBS for giving students the opportunity to capitalise on their strengths in multi-disciplinary design and allowing them to apply what they have learnt in the real world environment. This DBS branch is the product of the students concepts' brought to life, underscoring the SUTD vision, which is 'A Better World by Design'.



SUTD students' design ideas adopted in the DBS digital bank branch at SUTD

# THE 2016 CAPSTONE PROJECTS

This year, SUTD showcased its second batch of Capstone projects in August from the graduating class of 2016. Students from different pillars formed multi-disciplinary teams to work on projects to solve real-world problems.

There were 43 projects in total, with a majority of them being industry-initiated, and students had the opportunity to work with companies like 3M, Banyan Tree, Samsung, SMRT, Rolls-Royce and more.

## SHOWCASE HIGHLIGHTS

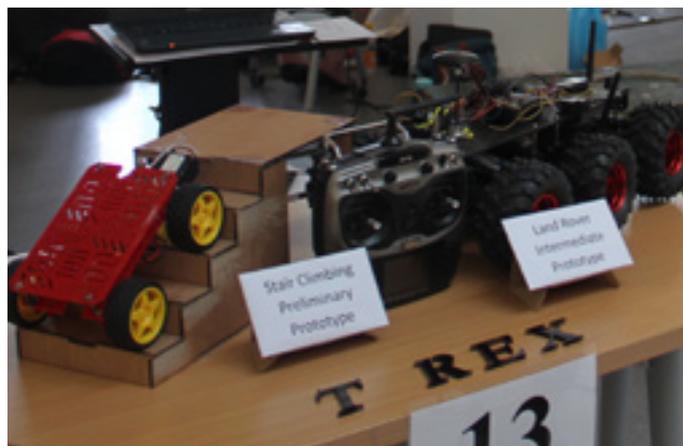
### 3M Smart Daylighting System

is a smart daylighting system that tracks the sun's position autonomously and pipes sunlight into the building to brighten up interior spaces. Students used proprietary 3M technologies to achieve this system.



### T-REX or Targetry Robot for Engagement Exercise

is a realistic mobile targetry system that features soldier recognition capabilities and sensors for navigation. With guidance from their mentors at DSTA, students also adapted the system's design to develop an innovative stair-climbing capability for a full-scale prototype.



The other projects were student-initiated; including entrepreneurship-type projects, where students hope to set up a company to market and sell their ideas going forward.

The Capstone projects span various areas and disciplines, ranging from smart technology, healthcare and mobility devices to sustainable architecture.

### Fúga Digital Chest Drain Device

improves on the existing procedure for draining excess liquids from the lungs and is small and portable, enabling patients to use it at home. Students worked with mentors from Changi General Hospital to design the solution and a patent for the device is pending.



### ZOUBA

is a student-initiated project in which the team proposed a relatively lightweight and user-friendly personal mobility device, designed to solve the last-mile problem. It can be easily assembled or disassembled and is able to fit into an average-sized backpack.



# THE 'LAST LECTURE' BY SUTD PRESIDENT PROFESSOR THOMAS MAGNANTI

BY SO JING WEN



*Professor Thomas Magnanti's 'Last Lecture'*



*Prof Magnanti sharing about his childhood*

On 9 November, SUTD Founding President Professor Thomas Magnanti, or more affectionately known as Tom, delivered his 'Last Lecture' titled 'I profess: To Living, Learning, and Laughing'. The lecture was warmly received by more than 300 students, faculty and staff.

This lecture was inspired by the famous 'Last Lecture' by Professor Randy Pausch and an ongoing series of lectures in the United States, where top academics are asked to think at a deeper level about what mattered to them, and then give a hypothetical 'final talk' exuding the essence of 'what wisdom would you impart to the world if you knew that this was your last chance?'

Though we see Tom around in school and occasionally listen to him speak at different events, we knew little about the story behind this great man, whose founding vision was to build a better world by design and establish the world's best design and technology school. This lecture shed light on his childhood, his college years and professional career. Tom vividly and animatedly shared about his memorable childhood experiences, his failures, work and personal life. He ended the lecture with inspiring life lessons and advice.

He also placed less emphasis on the downsides of the challenges he faced, but focused the audience on breakthroughs and enriching experiences that motivated and spurred the crowd. It was indeed an enjoyable and inspiring lecture coming from our president. This was a rare opportunity to hear from him on such a personal level and we believe that everyone had something to learn from him.

## CELEBRATING STUDENTS' SUMMER EXPERIENCES



*Learning Celebration Carnival*



*SUTD President, Prof Magnanti, checks out students' work*

Every summer (from May till September), SUTD students will either participate in local or overseas internships, research or exchange programmes to Massachusetts Institute of Technology (MIT) or Zhejiang University (ZJU), European Innovation Academy, Stanford, University of California, Berkeley and more. Through these avenues, the students put into practice what they have learnt at SUTD, in the real world environment.

At the end of the summer, students will showcase what they have learnt and developed at the yearly Learning Celebration Carnival (LCC), which took place on 28 and 30 September this year. LCC is also a platform for industry partners and potential hirers to assess the students' capabilities based on their experience from the various summer programmes.

This year, one of the highlights was that some teams who went for the Asian Leadership Programme in ZJU submitted ideas for a data visualisation competition. The Ali-cloud "Tianchi" Visualisation Contest organised by Alibaba saw over 900 teams from around the world participating and our students not only went into the finals, but also won the bronze award for their efforts.

## NATIONAL SCIENCE EXPERIMENT - EDUCATIONAL SENSORS TO STUDY STUDENTS' TRAVEL PATTERNS

BY ERIK WILHELM, BIGE TUNCER, NILS OLE TIPPENHAUER AND GEORGIOS PILIOURAS



With strong support from the National Research Foundation (NRF) Singapore and the Ministry of Education (MOE), in February 2015, a team of dedicated SUTD researchers and undergraduate students spearheaded an unprecedented challenge - to design a customised sensor from scratch for large-volume production.

By mid-September 2015, through the collaborative efforts between a plethora of industrial partners, the Science Centre Singapore and A\*STAR's Institute of High Performance Computing, 50,000 sensors were produced. These were then distributed to students from primary school up to junior college levels as part of the National Science Experiment.

The sensors provided participating students with measurements of the temperature, humidity, light levels, sound levels, and barometric pressure of their surroundings every 10 seconds, as well as kept count of their steps, motion, travel modes and indoor time each day. Students could then access an interactive learning portal to make sense of the data and learn about the fundamentals of statistics and data processing.

Over 90,000 students benefitted from this experience since the inception of the experiment, and the student base has expanded to also include polytechnic and ITE students in 2016.

Beyond teaching students about 'Big Data', the project has enabled a detailed analysis of the transportation landscape in Singapore,

illustrating that over 86% of students use public transportation on their commute, and that polytechnic students are almost two times more likely to take the train than younger students.

The data from the sensors is on a door-to-door basis, which enables an accurate picture of mean travel time to be composed, and we have learned that travelling by car is only 6 - 9km/hr faster on average than public modes. Overall this exciting project is a showcase of multi-disciplinary engineering talent at SUTD, with every pillar being represented in the project team. The National Science Experiment is a great example of the type of bold and innovative research projects undertaken at SUTD to benefit both its students as well as enrich the educational and research landscape in Singapore.

## INSPIRING BETTER URBAN LIVING - A SYMPOSIUM IN HONOUR OF SUTD'S FOUNDING CHAIRMAN



*Speech by founding chairman Mr Philip Ng*

In August 2016, SUTD's founding chairman, Mr Philip Ng, stepped down after over nine years at the helm of SUTD's Board of Trustees. Not only was he instrumental in establishing SUTD's two key partnerships with MIT and Zhejiang University, he also spearheaded the development of SUTD's vision, strategic principles and the building of SUTD's permanent campus.

To show our immense gratitude, as well as to commemorate what he has done for SUTD, a symposium entitled "Inspiring Better Urban Living" was organised in honour of Mr Ng. Besides inviting MIT Professor Richard de Neufville to give a talk on "Leadership in Technology" and Pritzker Prize Winner and



*Mr Ng receives commemorative art piece from new chairman Mr Lee Tzu Yang, in the presence of Tom and Minister for Defence Ng Eng Hen*

renowned architect Ryue Nishizawa to showcase his recent works, there was also a panel discussion on "Cities are in a Drive to be Smart: What does it all mean?", moderated by Chairman of the Lee Kuan Yew Centre for Innovative Cities, Professor Chan Heng Chee. Minister for Defence Ng Eng Hen also came to give a thank you speech to Mr Ng.

The symposium closed with Mr Ng sharing his reflections during the time he spent as SUTD's Chairman. Here are some excerpts from his speech:

"As the ex-chairman, I want to leave behind some thoughts for you to contemplate...to take

us to the fundamentals of SUTD, first the name SUTD and the mission to build technically-grounded leaders, and the vision, to create a better world by design. As leaders it is important to think about what leadership entails. Leaders operate in four areas, of vision, of ethics, of courage and of reality."

In addition, Mr Ng used Mr Nishizawa as an example to encourage students to think about whether they should 'Do what we love or love what we do'. He also shared that SUTD is an institution in Singapore; it should stay united and show the hallmarks of the Singapore spirit and brand.

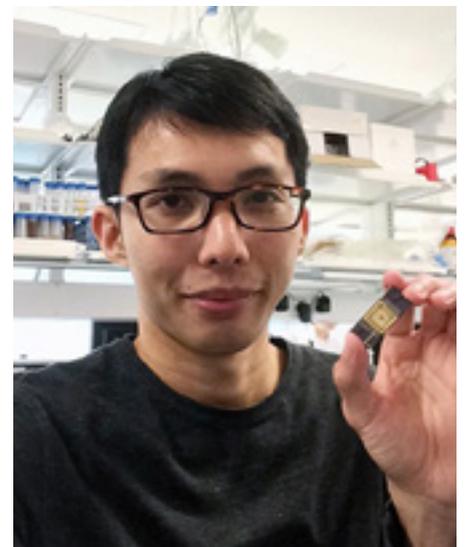
## SUTD FACULTY WINS PRESTIGIOUS MIT TECH REVIEW 35 INNOVATORS UNDER 35 GLOBAL AWARD

With growing demands for faster and larger computer memories, computer designers have long been looking for an alternative to replace current RAM and flash drives.

SUTD's Science faculty Assistant Professor Desmond Loke and his colleagues have developed a viable alternative that could be a vast improvement to existing RAM and flash drive memory. Their phase-change memory not only consumes low power and runs at high speeds for mobile, connected devices for "big data" applications, such as internet-of-things, virtual reality, data centres, etc., it also packs in many times more storage capacity than flash drives.

Moving forward, the research team will further develop phase-change memory - increase its capability of performing multiple functions, which will be useful for smart, sensory devices for next-generation big-data applications, for e.g., autonomous vehicles, deep learning, artificial intelligence and more.

For his research, Dr Loke became the first researcher from SUTD to receive the prestigious MIT Technology Review Innovators under 35 (TR35) international award under the *Inventor* category.



*Dr Desmond Loke with his phase-change memory chip*

## THE SUTD MASTERS OF TECHNOLOGY AND DESIGN LECTURE BY ARCHITECT DANIEL LIBESKIND

BY JEZAMINE CHUA



*Daniel Libeskind sharing more insights to his work during the Q&A session*



I remember the moment when I stood before the emptiness at Ground Zero, at the World Trade Centre site in New York City. My gaze was riveted upon curtains of cascading water falling into a deep abyss, a perennial image which immortalised the plunge of thousands of lives. I could not help but feel a sense of loss, as if I stood in the shoes of those who had lost their loved ones.

Unbeknownst to me then, this was part of the master plan by Professor Daniel Libeskind, who came to give a lecture titled 'The Language of Architecture' at SUTD on 1 November 2016. Instead of erecting volumes to fill the void, Prof Libeskind showed a deeper sensitivity by creating architecture that is invisible. He moved us with his profound ability to capture the counterpoint of a devastating moment and evoke emotions that ran deeper than our cultural differences.

In designing the Military History Museum and the Jewish Museum Berlin, Prof Libeskind explained that he did not seek to eradicate the traumas of history. Instead, he used the architectural experience as a mouthpiece to pose difficult questions, to impact how people perceive themselves and their history. He puts visitors face-to-face with their collective memories, in a space where all citizens, past, present and future, can continue the conversation about their common heritage and look beyond the past, towards a hopeful future.

Prof Libeskind introduced architecture as a language of light, proportion, materials and technology. The music virtuoso as a child believes architecture is akin to music - an emotional experience that communicates with every soul. This resonated with many students, who similarly share a passion for the arts in their manifold endeavours beyond the curriculum. To him, architecture should also communicate a unique story grounded in the genius loci of the site. In a familiar local project Reflections by Keppel Bay, he emphasised creating unique homes for every resident and fostering a sense of identity, community and connection to the site.

He awed the audience with his diverse palette of influences, such as the urban apocalypse portrayed in Walter Benjamin's *One-Way Street*, on the Jewish Berlin Museum, as well as the inspiration for a shopping mall from the 1941 Marx Brothers film *The Big Store*. The depiction of a store-turned home in the film motivated him to design a shopping centre in Switzerland that was like no other - a space filled with an impalpable atmosphere of light, air and experience that radically transformed the paradigm of shopping and the consumerist culture.

Whether it is defying equilibrium, the fragmentation of space or the manipulation of experiences, Prof Libeskind never fails to inject his own twist into his architecture. His phenomenal buildings today stand as a

testament of the boundless creativity of the human imagination, and the ever-expanding realm of architecture. He is truly an extraordinary architect who will definitely inspire many generations of architects to come.

## BEETHOVEN STATUE - GIFT FROM EVONIK TO SINGAPORE - SET TO STAY IN SUTD



*German sculptor Markus Lüpertz posing with his Beethoven statue*

As a gift to Singapore, the “Beethoven” statue is the only one in Asia and is set to stay in SUTD permanently. “SUTD is delighted to accept this gift on Singapore’s behalf, not only because we share Evonik’s vision to promote sustainable innovations, but also because SUTD aims to develop technically-grounded leaders through a holistic and well-rounded education that encompasses design and the humanities, arts and social sciences,” said Professor Thomas Magnanti, President of SUTD.

“Evonik’s presentation of the Beethoven statue to SUTD is an inspired gift. In SUTD we are always reaching out to understand innovation and creativity and how the process takes place. The lessons of the genius Beethoven for our students as they reflect on his life are many. Beethoven did not let adversity arrest his creativity. He turned his deafness into a source of strength. Silence created the space for ideas and sublime music to emerge,” added Professor Chan Heng Chee, Chairman of the National Arts Council and the Lee Kuan Yew Centre for Innovative Cities at SUTD, who was the guest-of-honour for the ceremony.

SUTD has received a giant bronze statue of Beethoven, a gift from leading German specialty chemicals company Evonik, to Singapore, in their efforts to drive cross cultural dialogue between Germany and Singapore.

“Singapore is one of our important markets in Asia and I am glad that apart from science and education, we are able to bring in the cultural aspects of Germany to this country,” said Dr Klaus Engel, Chairman of the Executive Board of Evonik Industries, during the statue unveiling ceremony at SUTD.

The sculpture was carved by German sculptor Markus Lüpertz, who is one of Germany’s most prominent contemporary artists. Lüpertz’s art pieces often merged abstraction and representation and this was reflected in the 2.7-meter high “Beethoven” statue that weighs 1,100 kilograms: the armless torso looking longingly into the distance, with a bust of the great German composer – as an interpretation of visualising Beethoven’s oeuvre and his genius triumphing over adversity.



*(L to R) Sculptor Markus Lüpertz, Prof Thomas Magnanti, Prof Chan Heng Chee and Mr Lee Tzu Yang*

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