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SUTD

SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN

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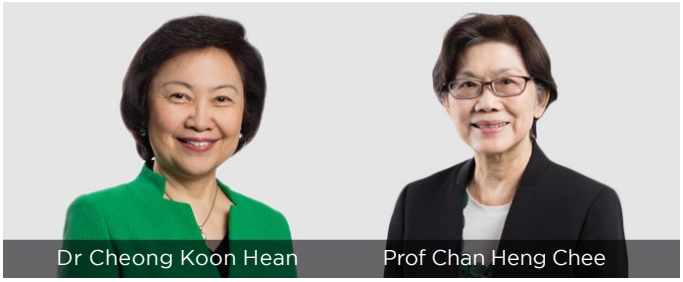
STUDENTS DESIGN YEAR OF THE OX CNY STREET LIGHT-UP

DR CHEONG KOON HEAN APPOINTED AS NEW LKYCIC CHAIRMAN


Dr Cheong Koon Hean Prof Chan Heng Chee

Former Housing Development Board (HDB) CEO, Dr Cheong Koon Hean has been appointed as Professor Chan Heng Chee's successor as Chairman of the Lee Kuan Yew Centre for Innovative Cities (LKYCIC). Dr Cheong, who will be taking over the role on 15 June 2021, will additionally be appointed Professor of Practice in SUTD.

Dr Cheong has had a long and illustrious career, having played a key role in the urban transformation of Singapore. As the CEO of HDB for the last 10 years, she had introduced a new generation of sustainable, well-designed, community-centric smart public housing and formulated multiple policies that enabled access to affordable housing. Before joining HDB, she was the CEO of the Urban Redevelopment Authority from 2004 to 2010 and a key driver of major growth areas such as Marina Bay. Currently, she is also the Chairman of the Centre for Liveable Cities under the Ministry of National Development.

SUTD President, Professor Chong Tow Chong said: "With her extensive experience overseeing the development and transformation of Singapore in sustainable urbanisation and smart public housing, we believe that Dr Cheong would be an invaluable addition to SUTD and LKYCIC. We look forward to her strategic leadership in taking LKYCIC to greater heights."

Since the establishment of LKYCIC in 2012, founding Chair Prof Chan has led the Centre to gain wide recognition for its multidisciplinary work and thought-leadership on critical issues concerning cities, urbanisation, the impact of technology on society, the economy, ageing and the built environment. Her leadership and standing has enabled the research centre to engage and partner a wide range of stakeholders, from think-tanks to leading academic institutions and government agencies. LKYCIC and IMD, Switzerland, also collaborated to produce the Smart City Index.

In 2018, Prof Chan worked with the Humanities, Arts and Social Sciences cluster in SUTD to establish a new post-graduate programme, the Master of Science in Urban Science, Policy and Planning. The main aim is to educate students to have a better grasp of urban issues, and using data science and computational tools for analysis.

Prof Chong added: "SUTD is truly grateful to Prof Chan for her deep insights and myriad life experiences. They have been instrumental in helping develop LKYCIC and the University. As a key member of the senior academic leadership in SUTD, she has made significant contributions to SUTD in strategic growth direction, including human capital development."

Prof Chan will remain as a Professor at LKYCIC after stepping down, and will continue her research.

CNY STREET LIGHT-UP FOR THE YEAR OF THE OX

2021 is the 10th year that SUTD students have worked with the Kreta Ayer-Kim Seng Citizens' Consultative Committee to design the Chinatown Chinese New Year street light-up. A team of 12 students came up with the design according to the key themes of 'Diligence', 'Harvest' and 'Success' for the light-up to showcase the perseverance, strength and energy of the ox.

In total, the street light-up had 888 lanterns, including 88 golden oxen. They were designed to look like Asian water buffalos, an animal traditionally used for agricultural practices, in alignment with the 'harvest' theme.

One of the students from the design team, Janelle Janice Ho, said: "Through this design installation, we wanted to inspire people to continue to press on and not give up. Although 2020 was a hard year, we are all gathered to celebrate the new year with a forward-looking mindset. In line with this year's Chinese zodiac, the decorations also depict many oxen as diligent and strong. The decorations along the road divider are also split into three segments to depict 'diligence', 'harvest' and 'success', complemented by many flowers and fruits. Thus, bringing across the idea of a bountiful new year — a hopeful and prosperous one."

SUTD APPOINTS PROFESSOR PHOON KOK KWANG AS NEW PROVOST

SUTD has appointed Professor Phoon Kok Kwang as the University's new Provost. Prof Phoon, who joined SUTD on 26 February 2021, was the Senior Vice Provost (Academic Affairs) and a Distinguished Professor at the National University of Singapore (NUS).

Prof Phoon brings to SUTD over 25 years of experience as a world-class researcher, top educator and active senior academic leader. A graduate of NUS and Cornell University, Prof Phoon is a geotechnical engineer and has served as the Head of the Civil and Environmental Engineering Department from 2013 to 2015. In 2015, Prof Phoon went on to chair the Task Force on Continuing and Professional Education that led to the establishment of NUS' School of Continuing and Lifelong Education. He was also the Chair of NUS' Promotion and Tenure Committee between 2015 and 2020.

An award-winning teacher and researcher, Prof Phoon has received numerous awards, including the Norman Medal twice (2005 and 2020) — the highest honour granted by the American Society of Civil Engineers, the NUS Outstanding Researcher Award (2010), the NUS Annual Teaching Excellence Award (2011 and 2012), as well as the Humboldt Research Award from the Alexander von Humboldt-Stiftung/Foundation (2017).

SUTD President, Professor Chong Tow Chong said: "We are pleased to have Prof Phoon join the SUTD family. His years of experience in academic leadership, as well as his understanding of SUTD's strong focus in design and interdisciplinary learning and research will take SUTD to greater heights in achieving our mission to nurture future leaders and innovators to serve societal needs. We eagerly look forward to Prof Phoon working alongside the SUTD community in the next phase of the university's growth."

Regarding his move, Prof Phoon said: "SUTD is a hidden gem where education is constantly being reimagined. I believe technology and design are here to make our lives better, not the other way round. SUTD has been actively working with stakeholders to educate the next generation of design innovators to offer a different future. I am deeply honoured to join SUTD where the entire institution is devoted to making this vision a reality."

INAUGURAL CAMPUS VISIT BY EDUCATION MINISTER LAWRENCE WONG

The Minister for Education, Mr Lawrence Wong, visited SUTD at its campus on Somapah Road for the first time on 18 November 2020. Minister Wong was accompanied by several representatives from MOE, including the Minister of State for Education and Manpower, Ms Gan Siow Huang.

SUTD President Professor Chong Tow Chong gave a progress update on SUTD to the delegation, with its Chairman of Board of Trustees, Mr Lee Tzu Yang, and several members of senior management in attendance, both physically and virtually via Zoom.

The meeting was followed by a showcase that featured one of SUTD's interdisciplinary design projects by Freshmore students and several project presentations by students from different levels and programmes at the Fabrication Lab.

Minister Wong interacting with Freshmore students in cohort classroom

Master of Archtecture alumna Nabila Pranoto presenting her climate change project to Minister Wong

SUTD AND MIT SCIENTISTS FIRST TO SIMULATE A LARGE-SCALE VIRUS, M13

Atomistic simulations are a powerful tool to study the movement and interactions of atoms and molecules. In many biological processes, large-scale effects, for example, assembly of large viruses to nanoparticles are important for the design of many devices and viral protein-targeted therapeutics. However, the time and length scale of these assembly processes are usually too large for simulations at molecular resolution.

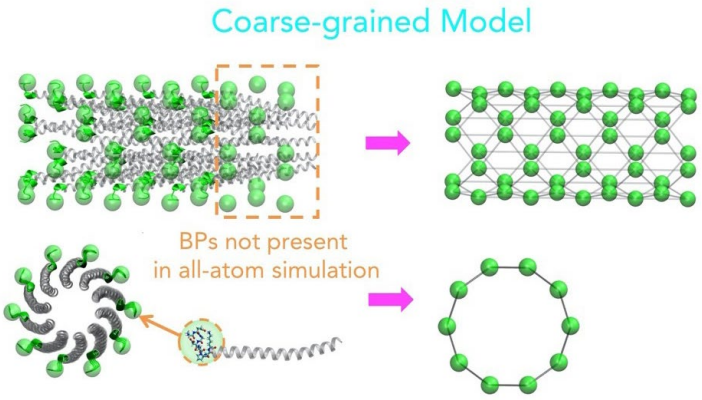
Even though an increase in computing power allows for more complex and longer simulations, virus structures such as M13 are still beyond reach. This is why a research group from SUTD and the Massachusetts Institute of Technology (MIT) has developed a procedure that links large-scale assembly processes to molecular simulations.

Assistant Professor Desmond Loke from SUTD's Science, Mathematics and Technology cluster said: "For the simulation of M13, we started with different sets of force fields. Suitable force fields were chosen and were used as the inputs for a molecule dynamics simulation with the coarse-grain model designed to capture the key pattern of the assembly process."

The procedure allows users to add different types of nanoparticles to a solution at a realistic level. Inspired by this procedure, Assistant Prof Loke and his colleagues were able to simulate a large-scale virus with nanoparticles and inside a solution for 50 nanoseconds.

Dr Lunna Li, an SUTD-MIT research fellow and first author of the article said: "The virus structure and solution contain about 700,000 atoms overall." Considering the shape and size of the features, the complexity of this simulation can be larger than any simulation performed previously.

MIT Biological Engineering Professor Angela Belcher was also part of the research team that simulated M13. This research was published in the journal Nanoscale.



Molecular view of a coarse-grained model based on the original structure of M13 major coat proteins

LARGEST STUDY OF ASIA'S RIVERS UNEARTHS 800 YEARS OF PALEOCLIMATE PATTERNS

The SUTD study will be crucial for assessing future climatic changes and making more informed water management decisions.

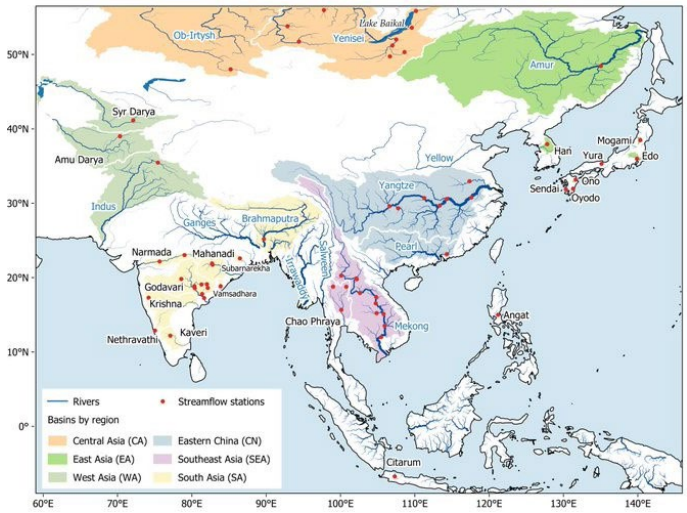
813 years of annual river discharge at 62 stations, 41 rivers in 16 countries, from 1200 to 2012. That is the data that researchers at SUTD produced after two years of studies to better understand past climate patterns of the Asian Monsoon region.

The study, 'Coherent Streamflow Variability in Monsoon Asia Over the Past Eight Centuries—Links to Oceanic' was published in Water Resources Research.

The Asian Monsoon region is home to many populous river basins, including 10 of the world's biggest rivers to provide water, energy and food for more than three billion people. This makes it crucial to understand past climate patterns to better predict long term changes in the water cycle and its impact on the water supply.

"Our results reveal that rivers in Asia behave in a coherent pattern. Large droughts and major pluvial periods have often occurred simultaneously in adjacent or nearby basins. Sometimes, droughts stretch as far as from the Godavari in India to the Mekong in Southeast Asia. This has important implications for water management, especially when a country's economy depends on multiple river basins, like in the case of Thailand," explained first author Nguyen Tan Thai Hung, a PhD student from SUTD.

"This research is of great importance to policy makers. We need to know where and why river discharge changed during the past millennium to make big decisions on water-dependent infrastructure. One example is the development of the ASEAN Power Grid, conceived to interconnect a system of hydropower, thermoelectric and renewable energy plants across all ASEAN countries. Our records show that 'mega-droughts' have hit multiple power production sites simultaneously. Now, we can use this information to design a grid less vulnerable to extreme events," said principal investigator, SUTD Associate Professor Stefano Galelli.



Map of the Asian Monsoon region; river basins involved in this study are highlighted by subregion, rivers belonging to the world's 30 biggest are shown with names indicated in blue

STUDENT PROJECT LED TO MEDICAL DEVICE DEVELOPMENT – THE SYRINGE BRAKE

During an eight-week mentorship under Changi General Hospital (CGH) in 2017, SUTD student Felicia Soon from the Engineering Product Development pillar came up with the proof-of-concept prototype for a low-cost dosage flow restrictor device that could be attached to a syringe to control the amount of medication delivered. Her visually effective and easy-to-use design was selected by CGH for further development to improve medication delivery and safety.

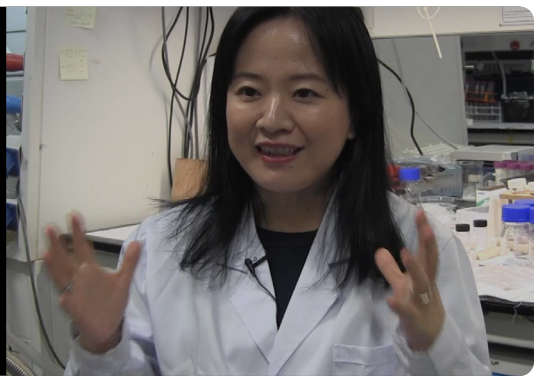
This led to the creation of the Syringe Brake, a device that has been implemented in busy hospital areas such as the Emergency Department (ED) and wards of CGH, and EDs of Singapore General Hospital and Sengkang General Hospital.

Felicia, who recently graduated from SUTD, said: "The aim was to make an affordable and simple attachment for medical syringes that was easy to use and hassle-free. After multiple discussions and ideation with my faculty-in-charge, Dr Khoo Xiaojuan, and CGH mentor, Ms Yasmin Ng, I managed to design the attachments and create simple prototypes with the 3D-printing facilities at SUTD to test and prove its effectiveness."

Felicia's CGH mentor, Senior Principal Pharmacist Yasmin Ng said: "Syringe Brake improves patient safety as it acts as an additional barrier to prevent the wrong dose from being delivered. It also allows manpower to be optimised by allowing the drug to be prepared by another person, freeing the doctor to attend to the patient's more pressing needs."

Under an SUTD biomedical and healthcare engineering core elective, the CGH mentorship involved engaging the students regularly so they understand the clinical needs and functional requirements — sharing literature research and encouraging students to do their own, and providing advice to aid them in creating inventions. The course presents SUTD students with an opportunity to apply their engineering design knowledge to the development of medical and healthcare solutions. It also serves as an efficient idea generation engine to create and promote cross-collaborative research between SUTD and CGH.

(L-R) SUTD alumna Ms Felicia Soon and Changi General Hospital senior principal pharmacist Yasmin Ng with the device they developed



PARTICIPATING IN THE MAPLETREE-SCCCI RIVER HONGBAO HACKATHON 2021

BY DYLAN RAHARJA

Two SUTD students were part of the three winning teams in this year's Mapletree-SCCCI River Hongbao Hackathon 2021. In total, 10 finalist teams were selected. Prior to the final presentations on 7 January, the youths were mentored by Mapletree's retail expert, Ms Joanna Lee, Director of Retail Management Systems, during two virtual workshops on 12 October and 2 November 2020.

One of the winning teams, E-Duo, consisted of Tan Hong Zhang and Dylan Raharja from SUTD, and Andy Lim from NUS. Dylan shares more about the group's concept and the challenges they faced.

"Forging a Brighter Future" *was the theme for this year's competition. It required us to incorporate either environmental sustainability or social enterprise into our business ideas. At first, we came up with the idea to sell customisable 3D prints that use bio-degradable filaments. The idea evolved to using 3D printing to create bio-degradable, customisable and aesthetically pleasing pots targeted at home gardeners.*

One of the challenges we faced on this project was to find the right idea and pitch to captivate the minds of the judges. 3D printing has been around for some time, and it would not be interesting if we were to only sell 3D-printed products. Hence, we came up with the idea to allow for product customisation. Once this was decided, we then came up with the costings, projected revenue and other details to help us draw up a feasible business plan.

During our presentation, the judges showed a keen interest in our idea, and our team made it to the final stage where we sold our products at the River Hongbao 2021 event in mid-February.

This is the third edition of the annual youth entrepreneurship competition, sponsored by Mapletree Investments Pte Ltd (Mapletree) and supported by the Singapore Chinese Chamber of Commerce & Industry (SCCCI).

A prototype of the customisable 3D-printed flower pot for home gardeners by E-Duo. [Credit: E-Duo]

(L-R): Mr Edmund Cheng, Chairman, Mapletree; Ms Low Yen Ling, Minister of State for the Ministry of Culture, Community and Youth & Ministry of Trade and Industry; and Mr Tan Aik Hock, Chairman, River Hongbao 2021 Organising Committee, presenting the Top 3 Finalists Award to E-Duo's Andy Lim (L) and Tan Hong Zhang (R) [Credit: River Hongbao 2021 Organising Committee]

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