



## The Mapletree Challenge 2022 Grand Final

Five teams battled it out to showcase sustainable innovation solutions that address societal concerns and challenges

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The top three teams of The Mapletree Challenge 2022 with Minister of State Low Yen Ling and senior management of SIT and Mapletree.

Mapletree Investments Pte Ltd and Singapore Institute of Technology successfully concluded the third edition of **The Mapletree Challenge Grand Final**. Two teams of SIT students – **RADnovation** and **The Gastronauts** – impressed the judges with their sustainable innovation proposals and emerged joint champions among the five finalist teams from SIT. The two winning teams each walked away with a cash prize of \$5,000 and the winners' trophies.

Team RADnovation, comprising six Year 2 Mechanical Engineering students, created a portable rehabilitation device that allows patients to perform exercises from home. The Gastronauts, made up of five Year 2 Food Technology students, proposed to repurpose spent coffee ground to grow oyster mushroom in a growing kit.

The Mapletree Challenge Grand Final was held at Mapletree Business City on 5 May 2022. Guest-of-Honour Ms Low Yen Ling, Minister of State, Ministry of Trade & Industry and Ministry of Culture, Community and Youth graced the event and presented the awards to the top three winners.

SIT President Professor Chua Kee Chaing said, "We are delighted to continue partnering Mapletree to inspire another batch of SITizen thinking tinkerers who will potentially make meaningful contributions to society. The Mapletree Challenge complements the University's pedagogy perfectly in that it enables our students to use their knowledge and skills to innovate and address problems of concern to society."

Mr Edmund Cheng, Mapletree's Chairman said, "The Mapletree Challenge has continued to support SIT students in their entrepreneurial journey for the third year running. We are glad to see SIT students constantly innovating and coming up with new ways to live sustainably. It is our hope that The Mapletree Challenge will inspire them to dream big and make a difference in today's world through their innovations."

This year's Challenge with the theme, *Improving Our World through Sustainability and Innovation*, saw the participation of 120 SIT students in a series of face-to-face and virtual training and mentorship programmes in the preparation stage of the Challenge. From January to May 2022, these participants attended six masterclasses on personal leadership, value pitching and financial literacy; a forum discussion on entrepreneurship and sustainable innovation by leading young entrepreneurs; as well as small group mentorship from industry experts on their entrepreneurial ideas.

Some of the ideas presented by the other teams include a sustainable water generation equipment that converts oxygen into water using solar energy, a mobile app for cyclists, and producing fish fingers from locally sourced ingredients with the lowest carbon footprint.

For the full press release, please see: <https://www.singaporetech.edu.sg/digitalnewsroom/the-mapletree-challenge-2022-grand-final/>



# Strategise, Support and Shoot!

SITizen Ambassadors get to know one another better over an exciting game of laser tag

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SITizen Ambassadors fuelling up before the game.

SITizen Ambassadors (SAmS) have played an important role in supporting SIT’s Advancement and Alumni Division (A&A) events, especially so in the last two years where they facilitated virtual meetings between Alumni mentors and Student mentees in various cycles of the SIT Alumni Mentoring Programme.

On Saturday 14 May 2022, 14 SAmS finally met up offline for the first time amid the pandemic. At the event hosted by A&A, they first enjoyed a hearty lunch at Nando’s before getting their adrenaline pumping in a fast-paced game of laser tag at Laser Quest @ Tampines HomeTeamNS. During the afternoon, they got to know one another better and gain a deeper understanding of the twin functions of A&A—which is to encourage and secure philanthropic giving in support of SIT and its students, while also serving as SIT’s main point of contact for all alumni to connect back with their alma mater and with one another.



All smiles around the table!

The SAmS had a blast, firing and dodging shots while supporting their teammates and attempting to complete their mission in the black-lit arena. Year 2 Hospitality Business student Mr Mohamad Irfan Bin Roslee said, “Echoing Barney Stinson from the well-known sitcom ‘How I Met Your Mother’, laser tag is awesome! The activity really allowed everyone from SAmS to the A&A team to let loose for a moment and just enjoy themselves.”

Year 2 Accountancy student Mr Melvin Tan shared the same thoughts. “I enjoyed competing and teasing the lowest scorers on their questionable strategy during the games. I also got to know all of the members on a personal level, and it was an enjoyable experience expanding and strengthening our relationships with one another,” he said.



All decked out and ready to have fun!





# AiSP and SIT Collaborate to Enhance Singapore's Cybersecurity Ecosystem

Both organisations will conduct professional training courses and share best practices in the cybersecurity community

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The MOU was signed by (left) Mr Johnny Kho, President, AiSP, and Associate Professor Ivan Lee (right), Vice President (Innovation), SIT, and witnessed by Dr Janil Puthucheary (center), Senior Minister of State, Ministry of Communications and Information & Ministry of Health. (Photo credit: AiSP)

A Memorandum of Understanding (MOU) was inked by Association of Information Security Professionals (AiSP) and the Singapore Institute of Technology (SIT) on 11 May 2022.

The collaboration between AiSP and SIT aims to create a vibrant and dynamic international information and cybersecurity ecosystem in Singapore. Both parties will jointly conduct training, share best practices, and participate in events and activities.

To enhance the cybersecurity ecosystem, AiSP and SIT will conduct training courses to raise the professional competency of information security personnel in Singapore. Best practices will also be shared to encourage knowledge-sharing within the cybersecurity community. A communication and collaborative framework between both parties will be established and implemented as part of the MOU agreement.

In addition, SIT students from the Information and Communications Technology (Information Security) degree programme will also stand to benefit from various initiatives and events where they can contribute to the cybersecurity ecosystem. These initiatives include the AiSP IoT Innovation Day, AiSP's Ladies in Cyber Mentoring programme, Student Volunteer Recognition Programme, Bug Bounties, as well as involvement in special interest groups.

The signing ceremony was witnessed by Guest-of-Honour Dr Janil Puthucheary, Senior Minister of State, Ministry of Communications and Information & Ministry of Health, and held at the inaugural AiSP IoT Innovation Day 2022 at Suntec Convention Centre.

To read the full story, please click [here](#).



# Advancing Singapore to 5G and Beyond

The Future Communications Translation Lab (FCTLab) established at SIT will facilitate industry adoption of nascent technologies in 5G and future communications

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The multi-disciplinary team at FCTLab comprises (standing, from left) Research Fellow Mo Ronghong, Assoc Prof Pei Yiyang, Asst Prof Purnima Murali Mohan, Prof Lim Boon Huat, Assoc Prof Tan Chek Tien, Jeff Aw, Prof Sun Sumei, Assoc Prof Jeannie Lee, (seated, from left) Assoc Prof Forest Tan, Assoc Prof Neelakantam Venkatarayalu, as well as (inset) Assoc Prof Benjamin Premkumar.

The future of Singapore’s workforce could change drastically with the power of 5G – the latest standard for wireless networks. Fast and enabling smoother connections, it could greatly benefit many aspects of modern life, from working remotely with ease to smoother play when gaming. Islandwide coverage of 5G is expected to kick in by 2025.

Professor Sun Sumei, Head of the Singapore Institute of Technology’s Future Communications Translation Lab (FCTLab), states that it could change a manpower-lean Singapore. “With the implementation of 5G, remote work can be done more efficiently, and work environment and safety may be greatly improved,” she said.

## When 4G Becomes 5G

SIT is at the heart of this transformation. The FCTLab started in mid-2021 as part of Singapore’s Future Communications Research & Development Programme (FCP), facilitating the adoption of 5G technology in the industry and workforce. Spearheaded in collaboration with Singapore’s Infocomm Media Development Authority (IMDA) and the National Research Foundation (NRF), it focuses on areas in 5G technology and applications, from robotics and automation to augmented/virtual reality.

“SIT is the ideal host of the FCTLab due to its reputation as Singapore’s university of applied learning, and its focus on applied research in Singapore,” explained Prof Sun. The FCTLab also has dedicated facilities and services that encourage open innovation with other institutes of higher learning (IHLs), research institutes, the industry and public agencies.

In addition, the FCTLab works closely with industry partners to bridge gaps and find solutions that industry partners and agencies may face when implementing 5G connections. For example, it recently launched a grant call for industry partners to collaborate with the implementation of a 5G test network infrastructure within the FCTLab and SIT campus.

“We want to hear pain points and feedback from industry partners, and collaborate closely and co-create solutions together,” shared Prof Sun.



Prof Sun Sumei (right) and Assoc Prof Forest Tan (left) spearhead the management of FCTLab and its projects as Head and Deputy Head respectively.

## Make it Real

One important aspect of this R&D process? Digitally simulating the performance of 5G connectivity in real-world settings. After gathering on-site data and translating it into modelling and simulation software connected to the 5G test network, different scenarios can be recreated to simulate the performance.

“Multiple areas of 5G applications, such as mobility and port applications, are spearheaded by Singapore,” said Prof Sun. “We are able to test if 5G can support the applications in such environments at the FCTLab by mimicking them digitally.” “Testing will not be the end of the R&D process,” she added. “If we encounter problems in terms of 5G performance, we will work on enhancement features so that we can deliver the required performance to support the applications.”

The FCTLab will not only help industries, but also individuals. SIT hopes to train and develop 5G and digital transformation talent pools with the lab’s facilities and services. For undergraduates, the FCTLab brings unique training opportunities and an immersive learning environment where they get to experiment with 5G technologies.

“We have students in degree programmes such as Computer Engineering who are studying relevant fields in 5G, intelligent transportation and port of the future applications,” said Prof Sun. “We are also offering Master’s degree programmes for post-graduates to develop deeper capabilities in 5G and future communications technologies.”

## Going Beyond 5G

Going even further, SIT is also meticulously crafting training frameworks and upskilling programmes for those in the workforce who are looking to refresh or upgrade their 5G and future communications knowledge and skills. The university is even looking beyond 5G and into the endless possibilities that future communications has to offer.

“At the FCTLab, we do not want to stop the journey at just 5G,” said Prof Sun. “We are aiming for continuous success beyond current technologies.”

To view the full news story, please visit the [SIT Digital Newsroom](#).



# Singapore Food Story Grant Awarded to SIT in Future Foods

SIT’s Asst Prof Du Juan and A\*STAR’s Assoc Prof Bi Xuezhi have been awarded an Industry Alignment Fund (Pre-positioning) to kickstart a first-in-Asia testbed platform to advance research on plant-based proteins

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These days, more consumers are making the switch to plant-based diets for health reasons. Many are also more open to trying novel foods and seek a variety of food choices. According to a report by [NielsonIQ](#), manufacturers and investors have been quick to leverage the increasing demand for plant-based proteins.

Plant-based products made from soy, peas, or wheat should be quite familiar to most consumers. However, there are rising concerns over the quality, digestibility, and potential allergens of plant-based proteins – something that food manufacturers need to be aware of when developing novel foods for human consumption.

## First IAF-PP Research Project Hosted by SIT

Earlier this year, Asst Prof Du Juan from SIT and Assoc Prof Bi Xuezhi from A\*STAR’s Bioprocessing Technology Institute (BTI) were awarded an Industry Alignment Fund – Pre-positioning (IAF-PP) to kickstart the development of a testbed platform to advance research on plant-based proteins in Asia.

This is the first time SIT will host an IAF-PP research project. The grant is awarded under the Singapore Food Story R&D Programme jointly led by Singapore Food Agency and A\*STAR. Titled “First automated protein profiling and functional characterisation platform for plant-based novel foods”, the IAF-PP research project will involve BTI, A\*STAR’s Institute of Materials Research and Engineering (IMRE), and the National University of Singapore (NUS).

Team lead and co-Principal Investigator, Asst Prof Du Juan explains why there is a need for such a testbed platform here:



### Why is there a need to develop a testbed platform for plant-based proteins in Singapore?

Currently, the food and beverage industry does not have access to a centralised platform that provides cost-effective and resource-efficient services for protein profiling and functional property tests. This means that companies interested in developing plant-based food products will find it challenging to meet food safety and quality criteria to screen many plant-based protein ingredients due to the unknown allergenicity, nutritional, and functionality information of plant-based protein ingredients.

### What can the proposed testbed platform offer?

Aside from food safety, the testbed can identify previously unknown uses or applications of ingredients. Alternative sources of plant-based proteins that were previously overlooked can be tested at the platform for digestibility, potential allergens, and more. The platform can help to ‘match’ food and beverage manufacturers with suppliers of raw ingredients. Both types of companies can leverage the platform’s research findings to spark food innovation. The approach is to use an automation process to increase output to profile and characterise functional properties of protein. This will help reduce the time and manpower costs of traditional research methods.

In addition to research on the potential food applications of alternative plant-based protein, the team of researchers also hope to provide technological expertise needed for protein extraction process. The team will also examine broader concerns such as how to store ingredients safely with the Hazard Analysis and Critical Control Point (HACCP) plan in mind.

### How did this idea come about?

Asst Prof Du shared that the idea for this project has been simmering in her mind for a long time. Before she joined SIT, she was from the food and beverage industry. She said, “I have always thought that there should be a service sector for suppliers of raw ingredients and manufacturers in search of ingredients to develop novel food products. I was fortunate enough to meet Assoc Prof Bi Xuezhi from A\*STAR, who was trained as a plant biologist with proteomics expertise and shared my views, hence we decided to work on a proposal together.”

### Why is there a need for a research platform like this now?

“The research platform will help to accelerate Singapore’s ‘30 by 30’ food security goals. As a small country, we are more vulnerable to unpredictable forces such as pandemics and wars. We should explore sustainable ways to use quality ingredients to produce high-quality, nutritious, and safe foods in sustainable quantities,” said Asst Prof Du.

To read the full story, please click [here](#).



# How Big Data can Make a Big Impact

Assoc Prof Nitin Indurkha first coined the term ‘big data’ in a predictive data mining book that he co-authored in 1998. He has since been involved in various consultancy work on data mining and language technologies, and is now part of the academic team

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Assoc Prof Indurkha explains how big data plays an integral role in positively addressing complex problems, such as combatting COVID-19.

Batman harnessing cutting-edge spyware technology to capture the Joker by hacking every phone in Gotham City in Christopher Nolan’s superhero film *The Dark Knight*, Tom Cruise’s character on the run when accused of a future murder by an advanced crime prediction software in Steven Spielberg’s science fiction flick *Minority Report*; both movies have one thing in common.

“Big data is right in the middle of it,” said Associate Professor Nitin Indurkha, who specialises in the subject at the Singapore Institute of Technology (SIT). Hollywood has given big data a bad rep, but in the real world, over three decades of experience in the field tells him otherwise.

“Big data helps with quality of life, raise standards of living and improve productivity,” said Assoc Prof Indurkha, who coined the term ‘big data’ while co-authoring a predictive data guidebook published in 1998. “There are a lot of benefits.”

This is thanks to a rapidly improving ability to process valuable information from the sheer quantity of digital information available worldwide today. In essence, this is what big data is all about. “It is all about scale. It’s referring to the amount of data we have,” he explained.

And if this massive trove of information is applied correctly using techniques like predictive analytics and machine learning, the world only stands to benefit.

## The Ultimate COVID-19 Weapon

The spotlight on big data has significantly brightened in the last two years when it became a powerful tool to battle the COVID-19 pandemic. The ability to access and analyse large data sets of patients worldwide allowed common symptoms to be quickly identified and this helped facilitate faster diagnosis and treatment.

“If patients can get diagnosed really fast, it can mean the difference between life and death for them,” he said.

This dual force of information and prediction also helped countries take preemptive measures to prepare for incoming waves of cases. For instance, BlueDot Insights – a predictive analytics cloud platform – was crucial to Taiwan’s stellar success in containing the initial outbreak of the virus. Getting an accurate forecast of the swiftly emerging threat allowed the country to shut its borders early, saving lives in the process.

“These are some of the ways in which predictive analytics can really help when you have something that is fast-moving, and you need information on how things evolve,” he said.

One area where big data truly helped turn the tide against the pandemic was through the rapid development and rollout of vaccines. What typically took 10 to 15 years to make was achieved in months.

Big data was central to the lightning-fast success. “This happened because people were using predictive analytics techniques to do trials,” explained Assoc Prof Indurkha. “By using computers to do simulations, they could use analytic techniques to fast-track the probe.”

To read the full story, please click [here](#).



# Breathe Easy: Reducing Transmission Risks in Future Airborne Viral Outbreaks

Asst Prof An Hui was recently awarded an MOE Academic Research Fund (ARF) Tier 2 research grant for his study on engineering control strategies to help reduce transmission risks of SARS-CoV-2 in hospital and non-hospital environments

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Stock photo.

Although most of us live and work in buildings, we may not give much thought to whether the indoor air we breathe is safe. In the wake of the COVID-19 pandemic, it has become critical to rethink the design of ventilation systems and even buildings.

Asst Prof An’s research will study SARS-CoV-2 transmission routes and their relative contribution to infection risks in both hospital and non-hospital environments. The results will be used to evaluate the existing effectiveness of different air-conditioning and mechanical ventilation (ACMV) systems.

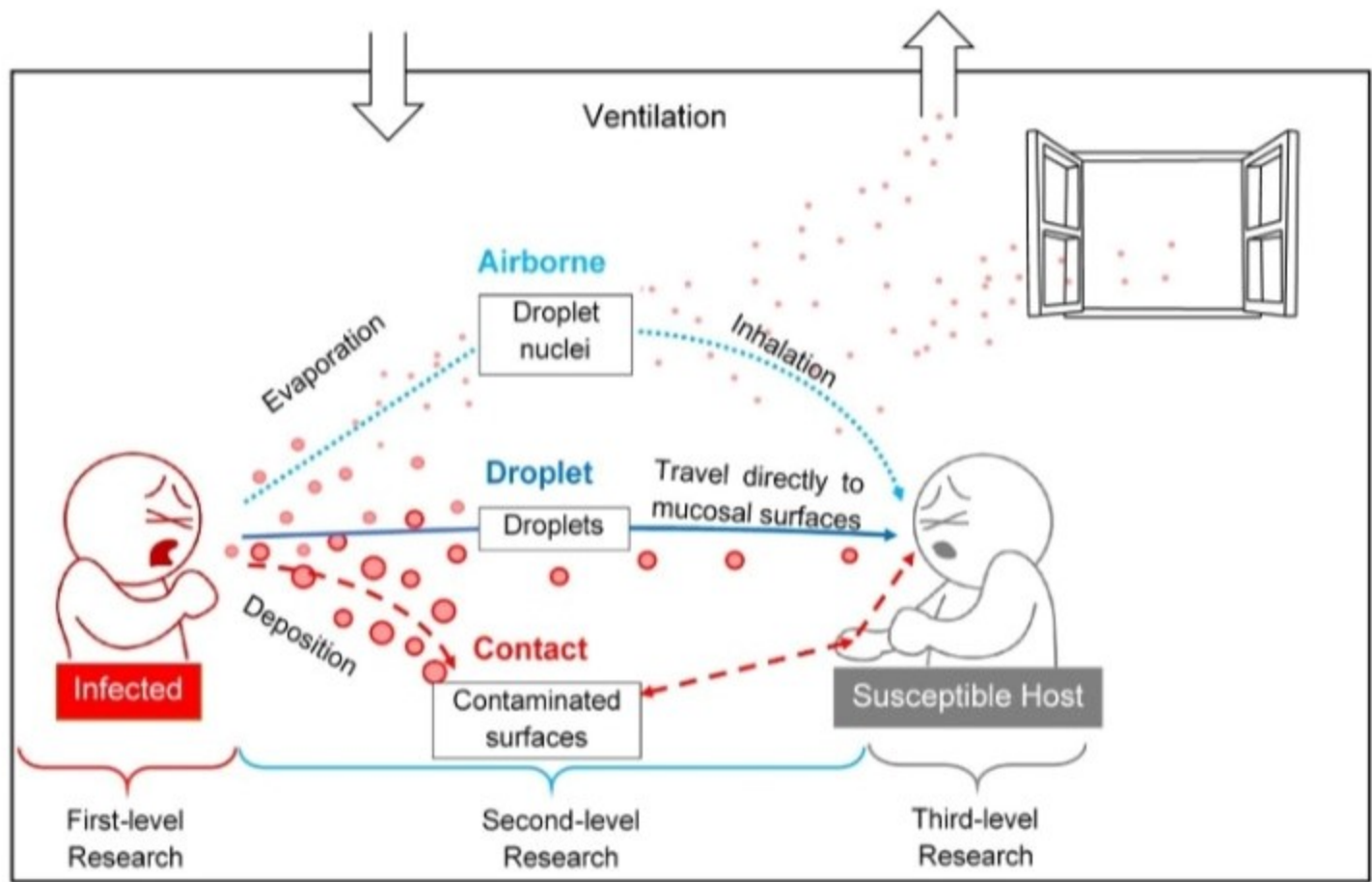
### The Research Team

Asst Prof An will work with co-investigators Assoc Prof Soh Chew Beng, Assoc Prof Victor Wang Peng Cheng, and Asst Prof Chien Szu Cheng from SIT’s Engineering cluster on this study. His team of collaborators also include Dr Helen Oh May Lin, Clinical Associate Professor, National University of Singapore (NUS) Yong Loo Lin School of Medicine and Senior Consultant-Infectious Diseases at Changi General Hospital, and Prof Simon Yu Ching Man from Hong Kong Polytechnic University.

### Scope of Research

The research will focus on four key areas:

- hospital-acquired infection due to COVID-19 and air ventilation strategy;
- community airborne transmission and passive design strategies;
- the effects of SARS-CoV-2 viral load and infective dose, and its transmission risks; and
- the use of ultraviolet germicidal irradiation (UVGI) technology for airborne viral disinfection.

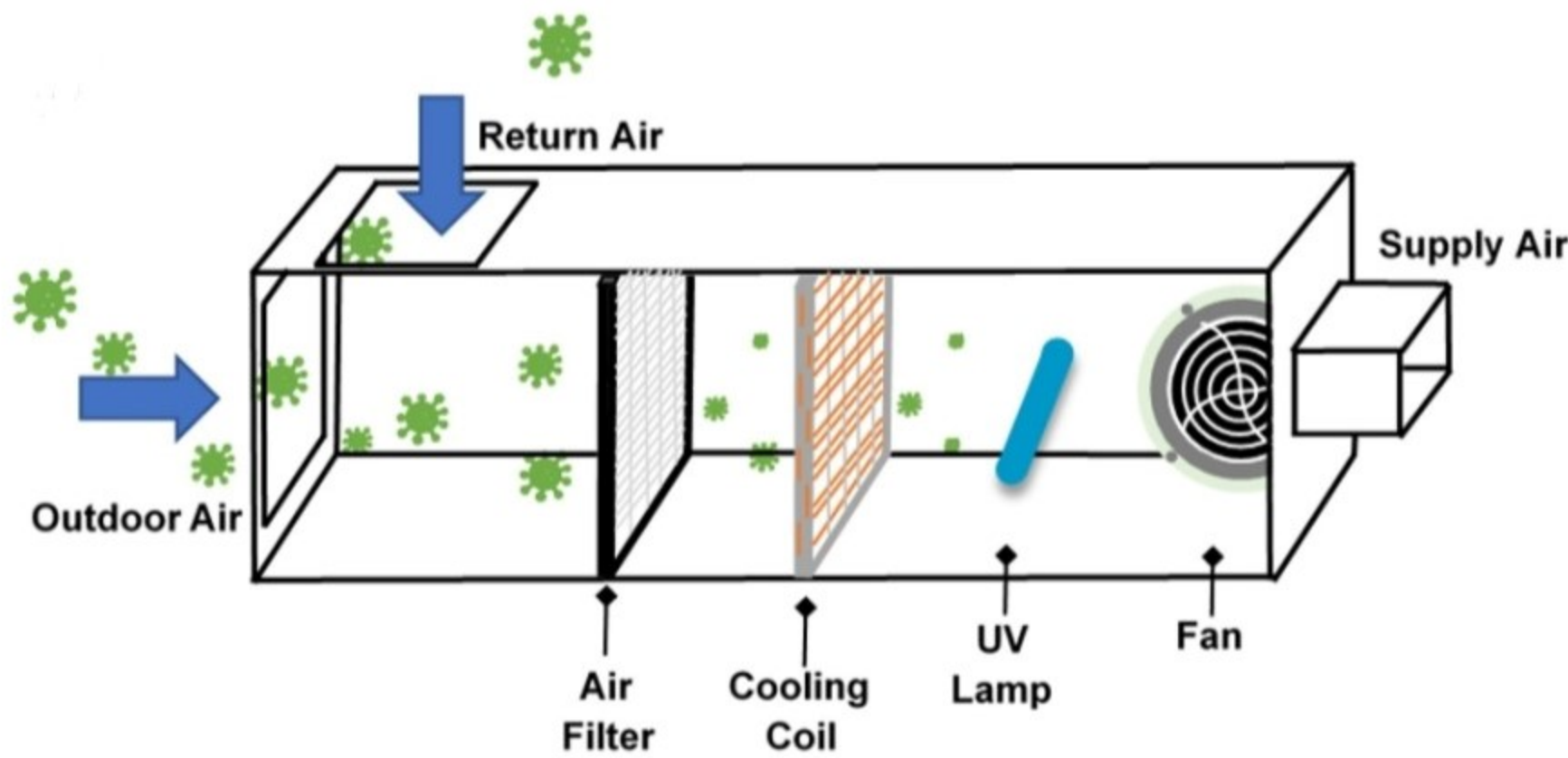


Proposed integrated SARS-CoV-2 transmission risks modeling approach.

Asst Prof An explained, “We will use an integrated biological fluid dynamics modelling approach to evaluate transmission routes and the transmission risks of other respiratory diseases. We can apply quantitative recommendations on the air ventilation rate, ventilation strategies, and passive engineering control measures. This will help reduce airborne transmission risks in non-pressure-controlled hospital wards and community spaces. Meanwhile, a contamination study will provide insights on how to control cross-infection and provide guidelines for disinfection in hospital wards.”

### Cleaner Air with In-duct UVGI Technology

Ultraviolet germicidal irradiation (UVGI) technology uses ultraviolet energy to kill viruses, bacteria, and fungal organisms. A bladeless-fan with UVGI design can be easily installed in any non-pressure-controlled hospital ward, or mechanical ventilated space.



Schematic diagram for a typical in-duct UVGI installation configuration.

“We will test the effectiveness of a bladeless-fan UVGI design as a form of safe, cost-effective, air cleaning technology. It is only a matter of time before the next pandemic strikes. We hope our findings will drive future research on the application of UVGI technology as an air cleaning solution in commercial buildings,” said Asst Prof An.

The results of the study will enable the researchers to provide critical recommendations on engineering control strategies that can reduce the transmission risks of SARS-CoV-2. It will also enable researchers to propose design strategies to incorporate UVGI technology in post-pandemic building designs.



# Spin to the Beat!

SITizens get an exhilarating ride to fitness at Spin Class, the first physical SIT Alumni Network event after a long hiatus

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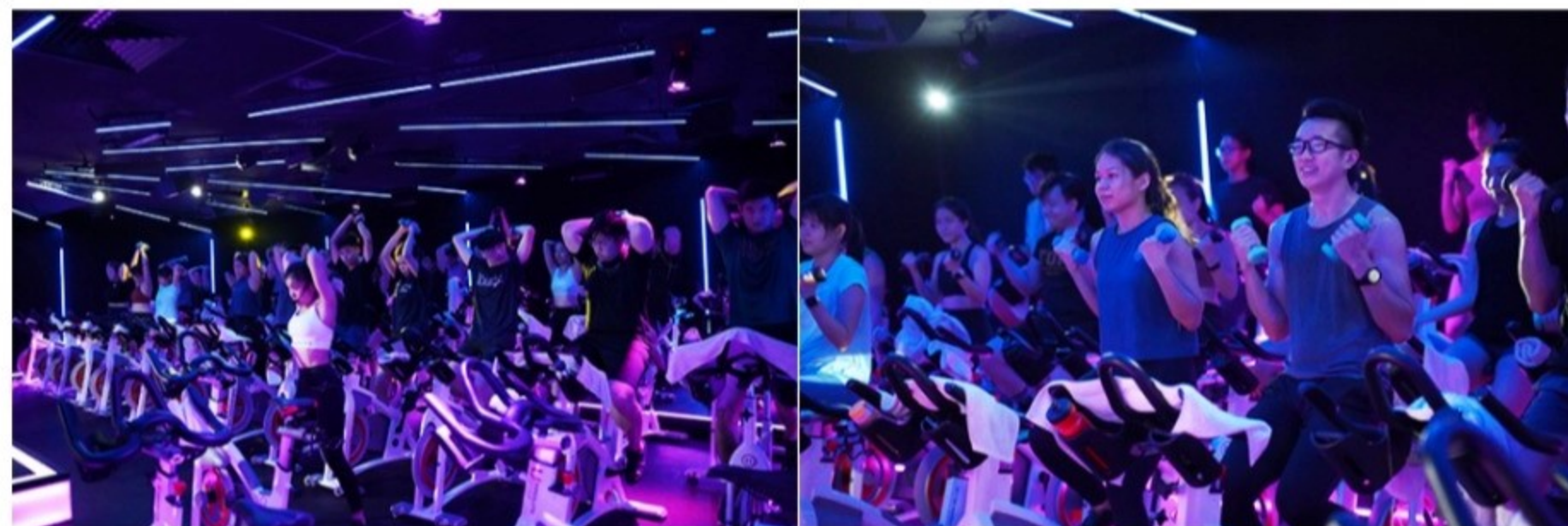
Their bikes may be stationary, but they certainly are not – participants keep their bodies moving as they groove and pedal to high-energy music.

The SIT Alumni Networks are finally making a physical comeback, starting with the Alumni Sports Network's Spin Class, held on Thursday, 19 May 2022 at Absolute You @ Centrepont. What better way to bring alumni back to physical events than a high energy workout, cycling to adrenaline-pumping beats?

Gathered in a studio lit by neon lights, almost 30 participants were taken through a quick facilitation to orientate themselves with their bikes and get used to the motion of riding. What followed next was an intense 45-minute workout, incorporating choreography and full-body movements, accompanied by non-stop encouragement from their instructor.

Mechanical Design Engineering alumnus Mr Valent Tan enjoyed the motivational atmosphere during the class. "It was tiring but enjoyable as I went with friends," he said. "You're inclined to try your best to maintain the intensity and rhythm to the beat of the songs, compared to other sports where I'm more chill and depend on myself."

With the easing of safe-distancing measures, SIT Alumni can look forward to even more exclusive events to enjoy with their peers, coming up soon.



Not just about cycling, spinning also incorporates weights to engage you in an effective fullbody workout.



SITizens sweaty but happy after a fun session!