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MAGAZINE

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HEY! WHAT'S INSIDE



3



14



22

- 2 THE NTU HEY! AR GUIDE
- 5 THE FOODBOT IS HERE
- 4 INGREDIENTS OF AN UNDERGRADUATE EDUCATION
- 12 RIDING THE DIGITAL WAVE
- 14 PANDEMIC PERSPECTIVES
- 16 SCI-FI GADGETS I WISH I HAVE AS AN NTU STUDENT
- 18 THE HIP (HOP) RESEARCHER
- 19 A HAND FOR YOU AND ME
- 20 RUNNING ESSENTIALS
- 22 MY FRENCH ROMANCE
- 24 A HYGGE SPACE
- 25 TOMORROWLAND
- 26 CONCRETE CHARMS
- 28 REDISCOVERING NTU ON FOOT
- 30 FYI - IN AND AROUND NTU
- 32 DO YOU HEAR WHAT I HEAR?
- 34 RISE OF THE MACHINES
- 36 I CAN HEAR YOO



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T. (65) 6790 5116. F. (65) 6791 8494.
Reg No 200604393R
Printer: Times Printers Pte Ltd

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STUDENTS ON COVER

From left: Steph Song, Ramanathan Periakaruppan, Muhammad Hasif Bin Abdul Halim, Cammy Mun

THE NTU HEY! AR GUIDE

Open the app and scan items on the pages to watch videos seamlessly and bring 3D objects to life

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Drag your finger near the object to swivel it

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Using two fingers, pinch or spread them to grow or shrink the object

New Tap here to anchor the object to the ground

New Tap here for a selfie view with the object



Once the object is anchored, you can walk around or near it for a closer look

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SCAN THIS PHOTO to see why it's a-bot time for lunch



THE FOODBOT IS HERE

These wheelie cute self-driving robots created by NTU students have been delivering meals to campus folks

Serial tinkerer third-year Renaissance Engineering Programme student Melvin Foo has a new feather in his cap: a fleet of self-driving delivery robots built by Whizz Mobility, a start-up he founded with his peers from NTU's flagship interdisciplinary undergraduate engineering programme.

The five electric-powered robots have been trundling along pre-mapped

routes around campus and even to the nearby CleanTech Park since June last year, delivering lunch and dinner orders as part of a pilot with Cates, a food delivery app developed by NTU-incubated start-up Wecome.

To date, the FoodBots have safely completed over 6,000 deliveries at designated food collection points.

The enterprising students recently added a special 3pm to 4pm bubble tea delivery

slot to sate demand for these thirst quenchers.

"It was such a surreal feeling when FoodBot first hit the ground running as Singapore's first outdoor delivery robot," says Melvin, 23. "We made the robot from scratch, including its navigation smarts."

Armed with rugged wheels, onboard cameras and algorithms, the FoodBots deliver with a "smile", rain or shine. Each robot can carry a 50kg load and run a few days in between charges.

Curious students who have tried to waylay the robot may have heard the robot's matronly reminder to leave it alone. Melvin lets on that his mother is the woman behind this voice-recorded message. "We wanted an authoritative voice, and I thought, nothing beats a mother's stern tone," he says with a grin.

Now vying for a slice of the food delivery pie, Whizz is going ahead full throttle, talking to potential food & beverage collaborators, and exploring the option of extending its delivery services to non-food partners.

"It was serendipity that we were already building our prototype when COVID-19 hit us at the start of last year," says Melvin. "Pivoting into the food delivery market became timely when we plunged into a pandemic that sent demand for food deliveries soaring."

And this is only the beginning, says Melvin. "Just like what the Internet did for the transmission of information, we want to make the vascular system of cities with our mobility solutions."

The heat is on for these whizz kids!

ALL IN A DAY'S WORK

FoodBot knows the drill, and gets the job done rain or shine.



FoodBot is assigned to dispatch food and is monitored on the job.



Waiting "patiently" for a bubble tea order.



Onboard sensors help it cross a street safely.



Satisfied worker. What's next?

INGREDIENTS

OF AN

UNDERGRADUATE

EDUCATION

How do you prepare students for the future? Start with a spoonful of interdisciplinary learning and follow up with a dash of international exposure, a pinch of innovation, a sprinkling of industry know-how and research immersion and an internship to taste. This is the recipe of an NTU education

The world has changed mightily in the last 10 years, and so must what defines an undergraduate education. Speaking at the university town hall in January where NTU President Prof Subra Suresh unveiled the NTU 2025 strategic plan, Deputy President and Provost Prof Ling San mentioned that one of the goals of NTU 2025 is to produce graduates ready for the future and who are effective, independent learners.

Interdisciplinary

Second-year Data Science and Artificial Intelligence student Cammy Mun, who takes classes from both the School of Physical & Mathematical Sciences and the School of Computer Science & Engineering, is a shining example of how undergrads can benefit from interdisciplinary learning.

“Unlike the students who specialise in computer science or computer engineering, I take math courses alongside coding and computing modules, which helps me draw connections between these cores of data science and to think critically,” she says.

“For example, I’m now doing Data Analysis with Computer – a math-heavy module that uses the programming language R to find out the mean or median of data, as well as plot visualisations to process large chunks of data quickly.”

Her course has even garnered the attention of Forbes, which named it one of the 10 best AI and Data Science Undergraduate courses for 2021.

Starting in the new academic year, all freshmen will benefit from a common interdisciplinary core curriculum that covers topics such as digital literacy, communication and inquiry, ethics and global challenges.

“Not only will students from different disciplines be put together in teams to learn, they can take many modules from outside their own disciplines,” says Prof Ling.

NTU’s new interdisciplinary bachelors’ programmes and fresh combinations of double majors also help build versatility for new career demands.





Internship

Fourth-year Computer Science undergrad Milla Samuel knows the thrills of putting into practice what is learnt in the classroom and getting noticed at work even before she graduates. The Renaissance Engineering Programme (REP) scholar has already completed two internships and will be doing two more this year.

One of her internships was a remote internship as a software engineer with Canadian start-up Picovoice, which she landed fortuitously.

“When I was studying in University of Berkeley, California, in my third year as part of the REP programme, the vice-president of Picovoice spotted my portfolio on GitHub, a code-sharing platform. He noticed I was based in the Berkeley area, and offered me a position after an interview,” says Milla.

“I was initially supposed to go for an internship with Dell in Silicon Valley, which the NTU programme helped me secure, but I couldn’t stay on in the US because of the pandemic. I’m thankful I was allowed to do my internship remotely,” she adds.

Her multiple internships have given her lessons that are invaluable to any student, including the chance to create real impact. During her second internship with GovTech Singapore, she worked on SupplyAlly, a digital platform that had to be ready at short notice during the Circuit Breaker period to facilitate the distribution of COVID-19 essentials by volunteers.

“One of the most important things I’ve learnt at work is to be open to feedback and to readily ask questions. You learn the fastest on the job, but when you’re stuck, don’t just sit there and try to figure out things on your own. You have to ask for help and take advantage of the mentorship you get,” she says.



Immersion

Being immersed in research can spark a lifelong passion. Take it from Biological Sciences student Steph Song, who discovered her affinity for healthcare research, specifically in reproductive biology, at NTU.

“I was born a premature baby and research into this area fascinates me as it helps me understand my own life story. I’ve worked on three research projects so far, on topics revolving around female physiology, hormones, cancer and urinary tract microbiology,” she says.

The CN Yang scholar, who wants to do her final-year project remotely with Harvard Medical School, clearly enjoys jumping headlong into research.

“Many times, a surprising result can be achieved with the smallest and – what we think is – the most insignificant thing. I take joy in discovering the unknown, and it’s rewarding to see your effort become part of a discovery that could potentially change the world,” she says.

Under the new Global Alliance of Industries @ NTU, undergrads will have even more opportunities to be part of research done with more than 200 industry collaborators that include those with laboratories at NTU, such as Rolls-Royce, Delta Electronics, Saab and Alibaba Group.





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to interact with
the student-
designed electric
car in 3D

Innovation

Experiencing the heady rush of being a tech pioneer is final-year Mechanical Engineering student Koh Ley How, who is working on the latest iteration of Nanyang Venture 11, an electric car with a design inspired by a killer whale that has already won an award at Shell's annual eco-car competition for students around the world.

"My main task is to improve on the existing design of the gear train and also redesign its components to make it sturdier. As the official test driver, I take the vehicle out on drives and give feedback on how else it can be improved," says Ley How.

He follows in the footsteps of his seniors, who worked on previous models of Nanyang Venture. The Nanyang Venture 8, Singapore's first

3D-printed urban battery electric car, dominated headlines when it won six awards at the Shell competition in 2016, turning in Singapore's best performance.

Smitten by the allure of innovation in motorsports from a young age, Ley How is keen to help push the automotive industry to greener heights.

“Being able to take part in the Shell Eco-marathon is ideal for engineers-to-be who want to break new ground. NTU has a strong track record of winning at this competition, where innovation is key. That’s my motivation to keep working on the car. I’m keen to continue along this path in the future,” he says.

Opportunities to design and build are plentiful on the NTU Smart Campus, where innovation is encouraged and supported. A student start-up was recently in the news for developing FoodBots – self-driving food delivery robots. These four-wheelers have delivered over 6,000 food orders across the NTU campus (read more about the FoodBots on page 3).

“The FoodBot is an engineering dream for us. Almost every part of the robot is made by us, from 3D-printed parts to self-designed custom printed circuit boards,” says Melvin Foo, founder and third-year Renaissance Engineering Programme student.

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SCAN THIS PHOTO
to find out what's
in Ramanathan's
school bag



Industry

No education worth its salt can exist in a bubble. Exposure to real-world challenges makes learning relevant and impactful, and all the better if students can encounter these right on the campus.

For medical undergrad Ramanathan Periakaruppan, the Clinical Sciences Building in NTU's Novena campus is perfectly positioned in the heart of Health City Novena, especially now that he's in his clinical years.

“I truly feel the benefits of having NTU's Novena campus situated in the middle of the medical industry. With the campus just a link bridge away from Tan Tock Seng Hospital, I can be at the hospital in the morning and then at the medical library in the afternoon to do some studying. When I want to take a breather, I like to use the student lounge, where I can hang out with my friends,” says the third-year student.

He spends most of his time at Tan Tock Seng Hospital, where he learns from specialist doctors across different departments as they talk to and treat patients.

“One of the biggest takeaways from my clinical postings is being able to see how doctors actually treat patients with medical problems. Normally, during lessons, we perform tests on simulated patients, so it is quite different,” he says.

One valuable tip Ramanathan has picked up from the doctors he shadows is the importance of communication with patients and their families. He believes that apart from explaining an illness in an easy-to-understand manner with an appropriate tone of voice, having a good relationship with patients is key, as it is crucial that patients trust their doctors.

International

The guaranteed overseas exchange opportunity with Erasmus University Rotterdam in the Netherlands was what attracted third-year student Arthur Mun to NTU's maritime studies programme. Last semester, in the midst of a pandemic, he became one of the first students to take part in a remote exchange instead.

"We were supposed to spend at least a semester there in our third year, something students from other universities have to fight for. Unfortunately, we cannot be in the Netherlands now due to COVID-19, but I'm very thankful that we can still take the modules," he says.

The suspension of overseas exchange may have put a damper on going overseas as part of the NTU experience, but students who want to do courses not offered at NTU can still take virtual classes at about 24 partner universities worldwide.

“The Dutch professors teach quite differently from what we are used to here in Singapore. We also heard from veteran industry professionals, who spoke to us in small breakout rooms of six or less on Zoom. I don't think my seniors got to engage these seasoned experts in pre-pandemic Netherlands,” adds Arthur.

Apart from virtual classes held entirely on Zoom, Arthur and his classmates participated in a shipping simulation as part of the curriculum. The students played shipping moguls who had to decide what fleets to purchase or sell, how to expand their shipping routes and what financial steps to take to stay afloat.

"The simulation was a small way in which the virtual experience was made even more special for us. Not only did we have to work around actual market prices, we had to make the call before prices changed, just as in the real world," he says.



How I can make a difference to my education at NTU

Interdisciplinary courses taught me lateral thinking.

Shantini Rajasingam
NTU-University Scholars Programme



Industry comes to me, right here on campus.

Grace Tong
Renaissance Engineering Programme



Learn more about our signature programmes:

- Renaissance Engineering Programme
- CN Yang Scholars Programme
- NTU-University Scholars Programme
- NTU-NIE Teaching Scholars Programme
- Joint medical degree programme with Imperial College London (LKCMedicine)

Immersed in research is where I'm happiest.

Muhammad Hasif Bin Abdul Halim
CN Yang Scholars Programme



Find your interests here at NTU, ranked the world's top young university and 13th globally. Take interdisciplinary courses and develop your innovation ideas on the NTU Smart Campus where exciting new technologies take shape. With early immersion in research, international exposure at renowned partner universities and internships with industry leaders, lay a strong foundation for your future.

RIDING THE DIGITAL WAVE



Prof Louis Phee, engineering dean, innovator and entrepreneur – and one of the key drivers of NTU’s new interdisciplinary curriculum for first years – shares tips on building a strong career in the digital age, where artificial intelligence (AI), data and digital technologies are rewriting the rules of the job game

EMBRACE DATA

Data, as they say, is the new oil. The hottest jobs of the future will involve data manipulation. Jobs in automation, robotics, AI and data science will be trending upwards, but the importance of data manipulation is not limited to these sectors. For instance, lawyers can use AI to decipher past legal data quickly instead of relying on a paralegal. Civil engineers who design bridges using AI will be able to come up with something that is aesthetically out of this world, and yet with structural integrity. “Look at the top tech companies – their staff size plateaued years ago but their revenue has been growing. Embracing data, AI and robotics has made them capable of doing more with the same resources, or less,” says Prof Phee.

BE A JACK-OF-ALL-TRADES

University education trains you to become a master in one discipline, but in today’s context, being a jack-of-all-trades is equally important. NTU’s new common core curriculum for undergraduates places stronger emphasis on interdisciplinary skills in covering topics such as digital literacy, communication and inquiry, ethics and global challenges. “For instance, you may not need to learn everything there is to know about entrepreneurship, but you should at least be able to think out of the box. Similarly, regardless of your discipline, everyone should know about sustainability, or basic data analytics,” says Prof Phee.

MIX AROUND

Jobs of the future will be very interdisciplinary. You will need to be comfortable working with people from completely unrelated fields and to get along with them. The new interdisciplinary core curriculum for incoming freshmen will be a good teaser, since students from different disciplines will learn together in the same classroom, and develop their abilities to work in multidisciplinary teams, as happens in many real-life work situations. “When I was an undergrad, not once did I work with non-engineering students. With the new common core curriculum, this will certainly not be the case anymore,” says Prof Phee.

DON’T SHY AWAY FROM NEW THINGS

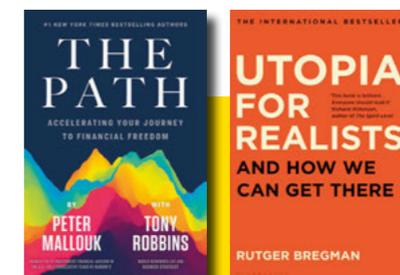
The future doesn’t stand still, and neither can we. Just like how COVID-19 accelerated our transition into the fourth industrial revolution, the pace of technological innovation means that new industries, companies and ways of working are always out there. With change being the only constant, be comfortable with being uncomfortable, says Prof Phee. This means being adaptable to change so it doesn’t throw you off. “In fact, forward-looking people who acquire in-demand skillsets before the rest would be ahead of the curve,” he adds.

LEARN TO “FISH”

While we used to think about finishing university as a destination, getting that degree is only the first step – the learning must continue as you go along so you can pick up relevant, new skills. More important than a laundry list of skills is the proof that you can learn new skills and adapt to solve complex and novel problems. In this respect, the nation’s emphasis on lifelong learning is spot on, says Prof Phee. “Learning, in itself, is a skill. It’s like fishing. If you learn how to fish, it doesn’t matter even if the species of fish you want to catch changes.”

DON’T FORGET THE HUMAN TOUCH

Machines and AI were never meant to put workers out of a job, but to ensure that they can be deployed for other more meaningful tasks that can only be done by humans, such as tasks that require empathy, creativity or ethical considerations. “If done right, science and technology will free us to embrace not only our creativity, but also our humanity,” says Prof Phee. “As a roboticist, I wouldn’t want to implement robots without having properly considered the implications of doing so. I have to think about the humanity and social aspects as well.”



HEY! AR SCAN THIS VISUAL to win a book and learn something new today

Horizon-broadening tomes up for grabs include bestsellers *The Path* by Peter Mallouk (with Tony Robbins) and *Utopia for Realists* by Rutger Bregman

PANDEMIC PERSPECTIVES

NTU students and faculty tell us the bright spots they found amid the COVID-19 gloom and the good that has come out of it



Be grateful for those around you



Science is necessary



Strength in solidarity



Consideration for others



Wonders of technology



"With more time for introspection and reflection, I learnt to let go of the trivialities and anxieties of everyday life, focusing on what is truly important – the people that I love and care for. Once we breathe and be still, we can find the wonder in every moment despite the pandemic."

- Assoc Prof Andy Ho, School of Social Sciences



"The pandemic shone a light on the importance of translational research. As a PhD student in the NTU team that worked on a COVID-19 diagnostic test, I experienced first-hand the positive impact that research can have on the community. Now I also better appreciate the important work of my peers in the scientific community."

- Wee Soon Keong, Medicine



"As an international student who hasn't seen my family for a year, I'm feeling homesick. Now I know how precious family time is. I'm blessed to have supportive hall mates who lift my spirits every time I'm despondent, and I've learnt to be grateful to everyone around me."

- Ruth Theresa, Materials Engineering



"COVID-19 has taught me that life – despite its ups and downs – is a gift to be treasured. Human relationships and human contact have become more precious. We have to protect our health, individually and collectively, and to realise that our little daily acts can have a really big impact."

- Assoc Prof Josip Car, Lee Kong Chian School of Medicine



"Reading about failed businesses, unemployment and the resulting pain and stress made me pause and reflect on my own situation. Being among the fortunate ones still employed, I felt I had to pitch in and help others in whatever small ways I could, so I donated 14 days of my annual leave to NTU's leave donation scheme in aid of student bursaries."

- Dr Babu Narayanswamy, Nanyang Environment & Water Research Institute



"There were waves of annoyance and frustration over the circuit breaker restrictions. But I became mindful of my privileged position, knowing that some do not have the luxury of staying or working at home during these challenging times."

- Nazurah Binte Ahmad Noerman, Sociology



"The pandemic has raised awareness of the issues faced by migrant workers. These workers contribute immensely to Singapore, and we need to care for them, which is what I plan to do through outreach activities by my university club this year."

- Meenatche Kambadhasan, Public Policy & Global Affairs



"I live-streamed my way through an exchange semester and completed a work-from-home internship. So grateful for the big little things in life like technology!"

- Samuel Chan, Public Policy & Global Affairs



"Technology has helped us overcome some of the downsides of COVID-19. For example, connecting with others and grocery shopping have not been disrupted."

- Prof Mary Chan, School of Chemical & Biomedical Engineering

HEY!

AR

SCAN THIS PAGE

to see how we helped others and kept everyone safe during the pandemic



"Maintaining friendships became more important than before when we were forced to stay apart. With the ease of technology, my friends and I easily caught up over Zoom."

- Chalmers Chua, Mechanical Engineering



SCI-FI GADGETS I WISH I HAVE AS AN NTU STUDENT

University life brings about many firsts and lasts. It may be the first time that you actually use a washing machine, or the last time that you fit into your fave pair of jeans. Sergul Toh dreams up some sci-fi gadgets to fix these teething issues

TIME TURNER

With campus life a constant juggling act between academics, co-curricular activities and friends, you will most definitely be strapped for time. Never ever turn in an assignment late again with the Time Turner, akin to the one used by Hermione Granger in the third book of the Harry Potter series. The hourglass pendant allows you to jump back a few hours in time so you have more than 24 hours a day to fully enjoy every aspect of university life. A massive upgrade from its less sophisticated cousin, Time Management.

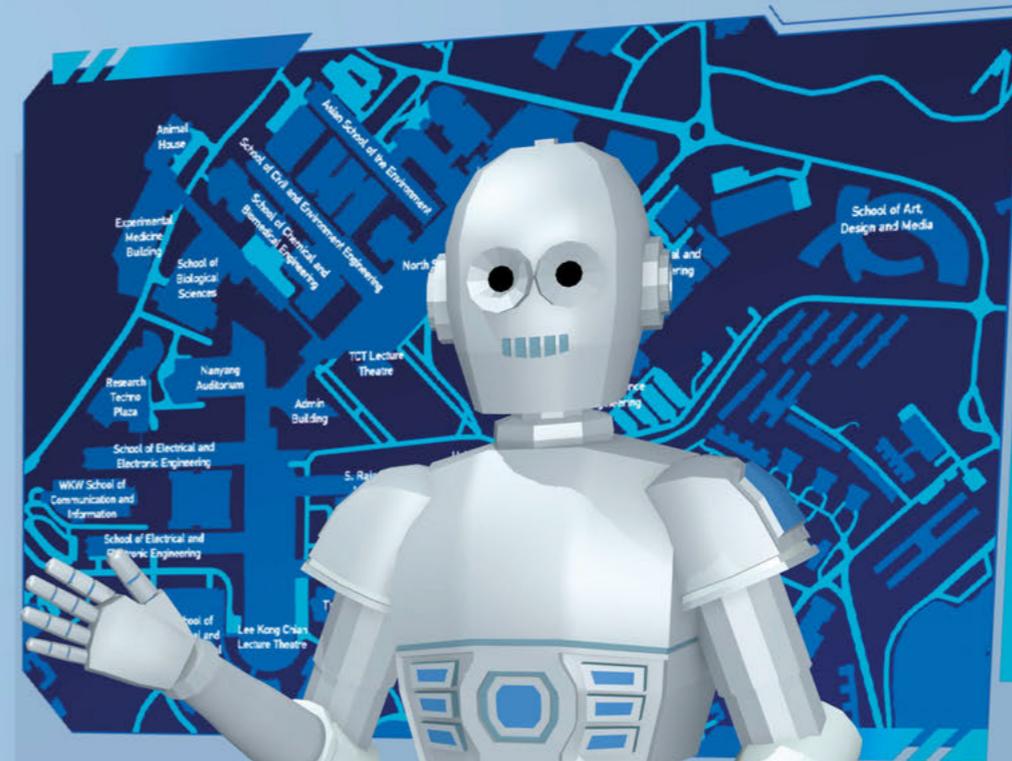


TRANSPORTER

When you live on a sprawling campus in the wild, wild west, there is great inertia to step out of school. Avoid the wait for the shuttle bus with the latest version of the Transporter, the teleportation device first seen in Star Trek. Simply step up onto a platform and be beamed to your destination without having to sit in traffic or shove through crowds. Not that you would need to leave this mini city much, though. Feeling under the weather? See a doctor at the university's health centre. Need some grooming? Get your hair and nails done at the North Spine. Snack shelf looking empty? Stock up at Prime or Giant around the corner.

FAT ERASER

Your eating habits (and waistline) could change drastically once you enter NTU, (no) thanks to the deluge of food options on and around campus, and helpful friends who sabotage your diet by asking innocently: "I am buying BBT (bubble tea). Anyone else?" Fret not, the Fat Eraser is here to take the weight off your guilt from all that bubble tea, Starbucks Frappuccinos, Boost juices and suppers you are about to have in the next few years. With a deceptively simple exterior (like your Staedtler eraser), the sophisticated Fat Eraser whittles down your waist without so much as a wince, melting all the sinful calories into mere eraser dust. Piece of cake, really.



THE MAP

Let's face it – whether you are a freshman or a final-year student, going for classes in tutorial rooms scattered all over NTU's 200-hectare campus means you often end up lost in a labyrinth of corridors that Google Maps can't help you out of. The next time you end up in a corridor with a dead end, consult The Map – much like the one Dora the Explorer uses – to decipher your destination and plot out an idiot-proof route. Coming soon: a special COVID-19 edition Map with inbuilt SafeEntry check-in capabilities.

ROBOT BUTLER

If you stay in hall, you will soon realise that your room does not clean itself, your dirty clothes won't magically reappear in the cupboard washed and ironed, and your empty fridge doesn't restock with a finger snap. On days when we are too bogged down by school activities, having a robot friend around would be helpful. The robot's experience in performing household chores makes him an ideal candidate to spruce up your hall room. For the ladies, perhaps he could blow dry your hair before you sleep. Much like NTU's own social robot Nadine, who can hold a decent conversation, the chatty robot butler could also make a good companion when your roomie is not around. I just pray the hall office will not evict him for illegal squatting...

HEY!
STUDENT
WRITER



Sergul is an avid basketball player and a minor gym rat. He aspires to rid his procrastination habits, but let's talk about that another day!

THE HIP (HOP) RESEARCHER

Dr Phan Quang Gia Chuong, 27 – better known as GC – has been breakdancing and graffiti painting all his life. With breaking set to make its Olympic debut in Paris in 2024, what's on the NTU researcher's mind?

When and how did you pick up hip hop?

I was about 10 years old and had just started listening to rap music. Being young and curious, I decided to learn more about the culture, which eventually led to me picking up graffiti and dance, and staying out of trouble in the process because I was quite the rebel! Since then, hip hop has been a huge part of my life. I've also won awards at national breakdancing competitions.

While pursuing your PhD at NTU, you started programmes to teach breakdance and graffiti as a residential mentor at Hall 8. Are you still cultivating the next generation of breakdancers and street artists at NTU?

Firstly, we breakers refer to it as breaking. Breakdance is its commercial name and I think it's my duty as a breaker to let the public know! Now that I've said that, the breaking and graffiti programmes were a great experience because I was doing what I believed in. I don't think I'm an expert in either art form, but I was glad to be able to introduce hip hop culture to students with whatever knowledge I had.

I have less time for these pursuits now because of my research work.

With breaking set to make its Olympic debut at the Paris 2024 Games, there will be more interest in the sport. Are there any clubs or practice spots in NTU that students should know about to kick-start their dance careers?

Of course! With breaking becoming an Olympic sport, the

dance form will be elevated, and more people will be willing to try it out. NTU has a vibrant dance scene. The breaking club, NTU Breakers, organises classes for beginners and open practice sessions. Due to COVID-19 restrictions, practices now follow a strict schedule and are held at specifically allocated spots. Join the club to find out where!

Chemistry and hip hop seem worlds apart. Has one ever influenced the way you approach the other despite them being unrelated?

They are different at the microscale but resemble each other at the macroscale. I believe that science is art and art is science. I can apply what I learn from one to the other. For example, to practise both science and hip hop, you must be meticulous, creative and always willing to learn through experimentation.

Now that you have thrown yourself headlong into research, what motivates you to continue practising both graffiti and breakdance?

I recently switched from graffiti to illustrative art, partly due to time and travel limitations. What motivates me to pursue my passions, apart from family and friends, is the culture that I have benefited so much from. Ever since I was an NTU undergrad, I have tried to paint hip hop and its practitioners in a better light. Many hip hop dancers I know are outstanding artists, educators and experts who actively contribute to

society. I am always happy to introduce them to debunk a few stereotypes.

What's your advice for budding young artists trying to balance their passions and university life?

I have struggled with the dilemma of dropping one to invest more time in the other. However, I also think it's normal to feel exhausted having to be on your toes all the time with both work and interests. To counter this, I take short breaks whenever I need to. I also like to set short-term goals so I have something to look forward to and be excited about when there's progress.



A HAND FOR YOU AND ME

NTU graduate Audrey Ng's art installation at the North Spine highlights the everyday heroes we often take for granted

Hands of the Invisible is a sculptural installation resembling a massive heap of food trays and cutlery typically used at hawker centres and food courts in Singapore. It was commissioned by Mediacorp for current affairs programme Talking Point.

HEY!
AR

SCAN THIS PAGE to watch a time-lapse of the making of the art installation

“ I am so honoured that Ministers Grace Fu and Amy Khor took the time to visit my sculpture in NTU. They were impressed by the uniqueness of each plaster-casted hand. ”

“ When people see my artwork, I hope they'll think: Look at that pile of crockery we used in one hour! Slow down and take time to honour the voiceless, unsung heroes who worked hard for this. You can tell they've been through much in life. ”

“ After speaking to the cleaners, I also realised that their work doesn't actually include collecting empty food trays left behind by diners. Their job is to clean the trays at the tray station and sort the dirty cutlery. ”

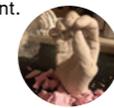
“ I wanted to raise awareness of the sheer volume of tableware handled by the workers who clean the tables and return our trays, and also to express gratitude for their contributions. ”



FROM LEFT: Audrey with Minister for Sustainability and the Environment Ms Grace Fu, NTU President Prof Subra Suresh, and Senior Minister of State Dr Amy Khor.

“ It was challenging to get the hands of elderly cleaners casted in plaster. Their fingers aren't as flexible, so it wasn't easy for them. ”

Scars, wrinkles, veins and other features that make each person's hands unique are captured within the plaster casts. One of the hands actually has a missing finger joint.



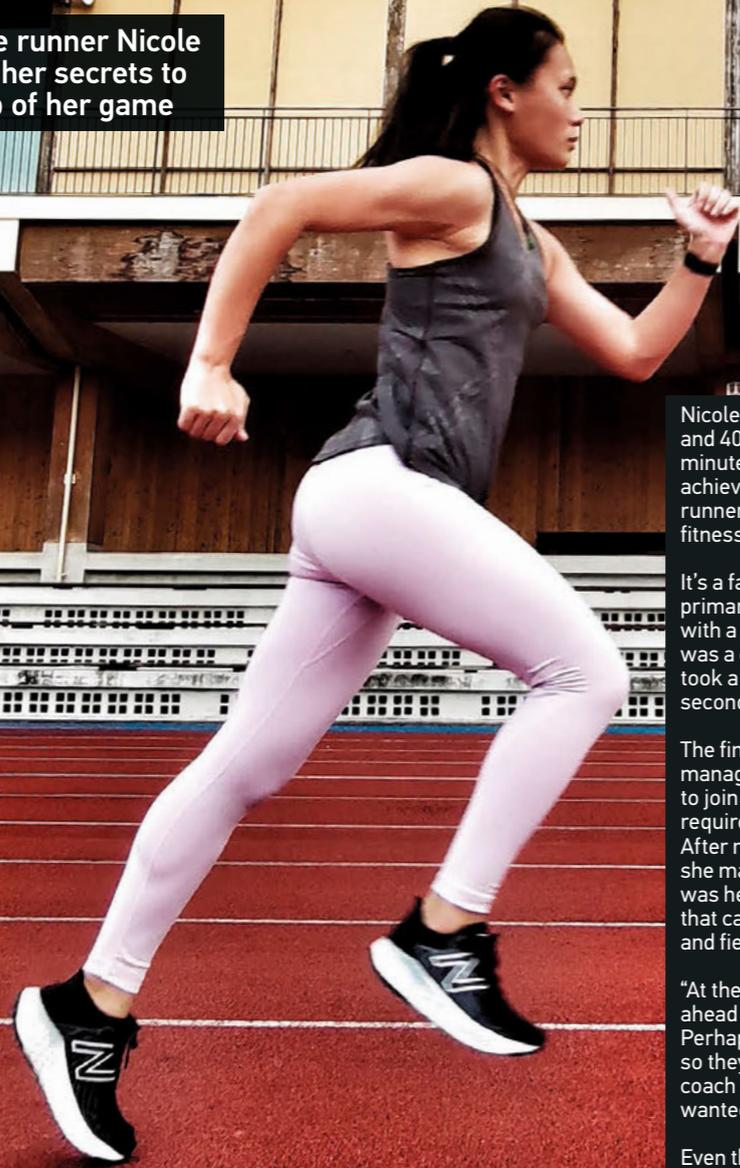
ARTI-FACTS

- ▶ 300 trays, the average number of trays found unreturned at each of Singapore's five hawker centres
- ▶ Cable ties hold the trays together; epoxy putty is used to adhere the cutlery to the trays
- ▶ Created over 30 days, from concept to completion
- ▶ Two hours to set up in NTU

HEY!
AR
SCAN THIS PAGE to catch GC in his element

RUNNING ESSENTIALS

Long-distance runner Nicole Low divulges her secrets to staying on top of her game



Nicole Low can run 2.4km in 8 minutes and 40 seconds, which is almost two minutes faster than the time required to achieve an Outstanding grade for male runners her age in the national physical fitness performance assessment.

It's a far cry from when she was in primary school and hated running with a passion. It didn't help that she was a chubby kid. Life fortunately took a healthy turn when she entered secondary school.

The final-year NTU sport science and management student was determined to join her school's netball team, which required a certain level of aerobic fitness. After many laps around Bedok Reservoir, she made it into the netball team but it was her aptitude for distance running that caught the eye of the school's track and field coach.

"At the annual sports day, I came in first, ahead of the rest of the school runners. Perhaps it was off-season for the team, so they weren't at their peak. But the coach came up to me after that to ask if I wanted to join the team," she says.

Even though Nicole declined then, she eventually joined the running team in Victoria Junior College, where she received proper training for the first time. It all paid off in 2019, when she broke the national under-23 10km women's track record with a time of 38 minutes and 18 seconds.

Run on, Nicole!



WHAT'S IN MY BAG

1 Lemon candy

I take one to keep myself awake during classes. It's more useful than you think!

2 Banana

I keep one handy for a pre-workout boost. It's the perfect fuel for running because it gets digested very quickly instead of just sitting in your stomach.

3 Running shoes

I am a New Balance ambassador, so most of my training gear is from New Balance. I swear by the 1080s for helping me go the extra mile when I

run. Not only are the shoes durable, their midsoles are soft and cushy, and provide great energy return.

4 Earbuds

Music keeps me going, literally. I rely on it to occupy my mind on my runs. Without it, I probably wouldn't be able to cover such long distances.

5 Portable charger

As I run five to six times a week and work out in the gym four times a week, I usually return to my hall room only late at night. This powerbank is a life saver.

6 Shower foam

A must-have when I work out in between lessons.

7 Water bottle

Sometimes I'll take a type of drink containing BCAAs (branched-chain amino acids) in between training sessions to help with recovery.

8 Recovery spray

I use this mostly on my calves and thighs, the areas that I focus on during my workouts. It helps my muscles recover faster and I ache less the next day.

HEY!
AR
SCAN THIS PHOTO
for your chance to win a pair of New Balance 1080v11 shoes worth \$259



MY French ROMANCE



Crêpes, a typical French meal.

From French elective at NTU to dream internship in France: Here's how one go-getting student did it, imbibing the best of joie de vivre



HEY! AR
 SCAN THIS VISUAL to explore the Eiffel Tower and take selfies there

Go to France (without leaving on a jet plane!)

"Che bellezza! Ti giuro, posso rimanere qui per sempre!"

An Italian friend exclaimed when she saw the crystal blue Mediterranean Sea from high up in the hills of Èze.

We were hiking one of the many trails along the Azure Coast near the glorious summer city of Nice. Below us was a quiet beachside town filled with olive-skinned bathers and old couples having their afternoon coffee. Just over the peninsula of Saint-Jean-Cap-Ferrat lay the iconic 10km stretch of silver beach. How did I get here?

Three years ago, in NTU as a freshman, I decided to learn a new language after hitting it off with my Francophone

friends on campus, many of whom were Swiss exchange students. Taking French as an unrestricted elective was ideal because it added structured learning on top of the conversational practice I already had. The single most important element in my learning was motivation in the form of daily encouragement from my francophone friends. Every time I learnt something new, I would immediately be able to use it in conversation. It was like eating candy – instant gratification.

Getting a job in France
 Three semesters came and went, and all of my friends went back home after their exchange. With the window for the mandatory engineering internship coming up, I decided to go on an adventure. Instead

of doing my internship in Singapore as I was supposed to, I went on some job-hunting websites in France to look for start-ups willing to take an ambitious university-level intern.

Being in computer science, I had the huge advantage of a very agile labour market, especially in France. I landed two interviews, for a start-up in Paris and a start-up in Montpellier. I carried through my plan, and locked in a contract with the HR disruptor CodinGame, a dynamic company focused on assessing IT competencies of tech recruits in a novel, gamified format. Getting the contract and visa was a breeze, and took less than a week on the French side. In mid-October, I received all of the papers I needed. I was going to France.

Settling in
 My arrival was simple. I spent a week in Paris, then rode a train down to Montpellier. I stayed in a cheap Airbnb in a migrant neighbourhood for a week while I looked for a share flat on local Facebook housing groups. Within two weeks, I had moved into an apartment on the outskirts of the city with a Moroccan guy, got a bicycle for the 10-minute commute to work, and figured out the lay of the land.

Magical Montpellier
 Montpellier is a beautiful seaside city with about 250,000 inhabitants. Being one of the largest student cities in France, where more than a third of the population are students, there is no lack of nightlife. I made many friends from cultural events and student hangouts.

On weekends, I cycled downtown to load up on fresh fruits, cheese and local ham from one of the three farmers' markets, pedalled along a flowery river down to the Mediterranean beaches with my friends, and went on long hikes between stark limestone peaks and lush green valleys of the national park just north of the city. Being on an important railroad link between Marseille and Perpignan meant that there was no lack of travel options. The great southern cities were within two hours of reach, and relaxing beachside towns were a quick 15-minute ride away. The French have truly mastered the *joie de vivre* – the joy of living.

Write English, speak French
 I worked in a techie start-up with Californian work values. This meant agile

work practices, lots of flexibility in projects, and good welfare at the office. We updated our products every week. A digital corkboard kept track of all projects, and we could work on whatever project we wanted. The team was incredibly supportive, and through a combination of hard work and consulting their expertise, I was able to pick up a huge variety of skills and best practices.

Our kitchen and gaming/hang-out area in the office was where we would have lunch and play video games together during breaks. We even had a dedicated office manager who organised events in and out of office for the team. My colleagues were all very accommodating, and I never felt any estrangement

being the only foreigner on the team. Language was an interesting issue at the office. All documentation and written correspondence were in English, but outside of the weekly meetings, the spoken language was French. This proved difficult during the first months of my internship, as I couldn't focus for more than 15 minutes when speaking and listening in French. However, in time, my conversational French greatly improved.

Hey you, try it out
 My year in France was one of the most amazing experiences in my university life. I got to live somewhere vast and beautiful. Flowery plains, azure sea, great mountains and valleys. The people

were incredible – the French are diverse, friendly and active. Work culture is flexible and relaxed, with a maximum 35-hour work week. Nobody thinks about work after work – you typically enjoy an *apéro* (a social event before dinner with wine and cheese), a picnic or a stroll in the old town streets.

France is all the magic that it seems to be. I spent a lot of time in the lazy summer sun of Provence, blending into the background of the little towns and villages of Occitanie, coffee in hand. I swam the blue waters and rivers of Hérault. I fell in love. You could have this! It's easier than you think. Learn the language, practise with friends, find a job online, and off you go! I know that I will be going back.



Toulouse.



Sunset at my place.



View from botanical garden of Èze.

HEY! AR
 SCAN THIS VISUAL to enter the Arc de Triomphe, another iconic symbol of France



HEY! STUDENT WRITER

Final-year computer science student Jay Ng plans to pursue a master's degree in data science in France or in Switzerland. No prizes for guessing where he wants to work after that.

NTU alumna Zen Teh (left) replicates the ambience of a forest at Hygge, NTU's new relaxation space. Her multi-sensory exhibition features aromatic scents by scientist Dr Ching Jianhong (right).

HEY!
AR
SCAN THIS PHOTO
for a 360-degree view of The Familiar Forest



A HYGGE SPACE

Slow down and take a breather at NTU's Hygge

If you asked five Danes what Hygge (pronounced "hue-gah") means, you'd probably get five different explanations. In the same way, a trip to NTU's Hygge is a little different for everyone.

The first steps to Hygge are easy; just climb to Level 5 of Lee Wee Nam Library. The next few are slightly trickier. Can you leave your anxieties with your shoes at the door as you step inside? Perhaps not, but that's where Hygge comes in. The 3,390 sq ft area aims to provide a safe space for not just your body, but all your senses to escape to.

Much of the space in the softly-lit room is occupied by "A Familiar Forest". Created by NTU grad Zen Teh, this year-long multi-sensory installation is a reimagination of a forest at night and comprises 34

images of local greenery hung from the ceiling, forest sounds and natural scents. Sensors placed around the room prompt the release of these scents and sounds to lull you into a spot of stillness.

More reasons to relax are at a little corner of Hygge called the Nook, where bean bags invite you to stay for a while and lean back with a paperback from a carefully curated shelf of wellbeing books.

In the pipeline are programmes, such as talks and workshops, on mental wellness.

If you haven't guessed by now, Hygge, a Danish and Norwegian word, is all about creating a warm atmosphere that engenders feelings of contentment and wellbeing. Bring it on!

“If we lose so much of our natural forest, but still desire to see some parts of nature, we may have to turn to images, artificial sounds, and so on.”

- Zen Teh



TOMORROWLAND

How NTU-made technologies are changing our future



A mask-have for the pandemic

Now
Be pandemic-savvy with a new smart mask co-developed by NTU scientists. Connected wirelessly via Bluetooth to a smartphone, the mask has sensors that can capture the skin temperature, blood

oxygen saturation, blood pressure and heart rate of the user.

Future
When developed into a small standalone device, the sensors can be easily attached to the inside of any mask. This will make it possible to remotely monitor the health of hospital-based workers and COVID-19 patients in real time.

Energy-saving "liquid window"

Now
NTU's materials scientists have developed a "liquid window" that can block sunlight to keep a building cool while trapping thermal heat that can be released through the day and night to cut energy costs. They achieved this with a water-based gel sandwiched between glass panes.

The gel traps and stores thermal energy, and in tests, this technology reduced up to 45 per cent of the energy needed in a building for heating, ventilation and air-conditioning.

Future
Buildings that adopt the new heat-trapping windows can be made predominantly from glass yet enjoy lower energy consumption without suffering from the greenhouse effect (where heat gets trapped in glass buildings).



HEY!
AR
SCAN THIS ILLUSTRATION
to see an unexpected turn of events



New spin on cooling

Now
A UFO-shaped bladeless fan is the latest cool gizmo on the NTU Smart Campus. Unlike conventional fans that blow air downwards, the made-in-NTU "Vortec" fan uses the vortex concept by drawing air up the centre and throwing it outwards like an umbrella. It can generate up to twice as much airflow at

half the electricity consumption, quickly cooling occupants in a room by wicking up moisture from their skin. Fitted with an ultraviolet LED, it's also COVID-19 ready as it disinfects itself, killing germs on its surfaces.

Future
Instead of using multiple air-conditioners, smart buildings can be kitted out with multiple Vortecs to circulate cool air and cut utility bills.

CONCRETE CHARMS

Seeing the University's facades in a new light



What's bubbling on the horizon?

How lucky we are to have nature at our doorstep.



How made it home.

SCAN THIS PHOTO



Stair all you want.

Tell me a gripping story here.



Alternative views are always welcome.



A kaleidoscopic hive of activity.



SCAN THIS PHOTO for a fresh perspective!

SCAN THIS PHOTO



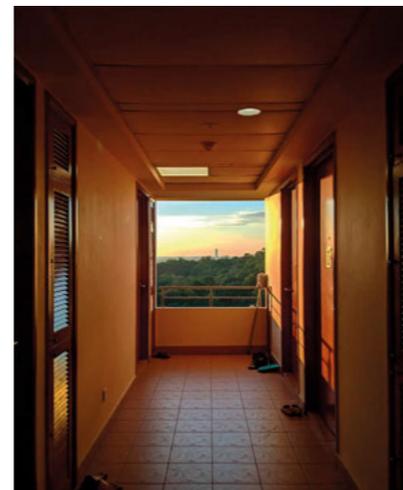
NTU student Andronicus Koshy reimagines NTU's icon.

SCAN THIS PHOTO to see the School of Art, Design & Media come alive as a skate park



Stay on the straight and narrow.

How life warms the heart.



Tetris in the sky?



REDISCOVERING NTU ON FOOT

Sergul Toh takes the road less travelled (and the occasional shuttle bus) in NTU and finds a campus that is at once familiar and yet startlingly new

I recently embarked on a journey across NTU so I could take in the sights and sounds of the campus that I have lived on for the past two years. After all, it is frequently listed among the top 15 most beautiful university campuses in the world.

My journey in the morning starts off not unlike a typical day for most NTU students: hitting the snooze button for a good hour. When I finally peel myself off the bed, I am already looking forward to the next time I can lie in it again. On my way to the toilet to wash up, it isn't the call of the legendary Asian Koel that's been sighted on campus that I hear, but the incessant iPhone alarms from my hall neighbours' rooms.

I proceed to the nearby canteen to fuel up for the long walk I set myself up for. Every student worth his salt would know that waking up in time for a good breakfast before a 9am class is a commendable feat. Doesn't matter that my order of half boiled eggs – every canteen's signature breakfast dish – turns out to be 101 per cent cooked, thanks to the extra love and effort put in by the canteen aunties. Maybe they will excel at playing Overcooked (a cooking simulation game) with one another.

The first leg of my journey sees me walking from North Hill to the Sports & Recreation Centre – a treacherous 650m-long uphill trek. There's a chance you will encounter preschoolers from the nearby kindergarten who may slow you down, but the biggest "obstacle" stopping you in your tracks are the adorable dogs trotting along this stretch of road. NTU professors who live on campus enjoy walking their cute canines. This might derail you from your plans, but seeing as how petting a dog can have a calming effect, we can all agree that the small sidetrack is worth it, right?

I pass by the Nanyang Executive Centre, which I discover is a hotel with guest rooms, ranging from deluxe rooms to executive suites. What a surprise find! I guess I know where to go for my next staycation. I just hope that they accept my SingapoRediscover vouchers.

Sporting spectacle

I finally arrive at the Sports & Recreation Centre. Somehow, merely stepping into this area makes me feel healthier. Perhaps it's the sight of a few brave souls running on the track under the afternoon sun. Jokes aside, on heatstroke alert, I soon yield to my screaming feet and plonk myself on the bleachers. Gazing upon The Wave's beautiful architecture, I'm in awe. I can't help but wonder how much grander the timber building will look at night, when lit from within.

The heat gets to me so I'm tempted to hide myself in one of the many air-conditioned rooms on campus. But that would be bad for the purpose of this story, so I trudge on down Lien Ying Chow Drive, along which sits one of NTU's oldest halls, Hall 1, which dates all the way back to the 1950s. I guess it would be considered "boomers" next to the new kids on the block – the Crescent and Pioneer residential halls down the road.

The CresPion cluster of eight tree-like blocks are integrated seamlessly into the leafy surrounds to create the experience of being in a rainforest. In fact, much of my walk felt like I was in a jungle of sorts, with each segment of the walk peppered with lush greenery.

As I take a right turn onto Nanyang Drive, towards Halls 4 and 5, there is not a single food stall in plain sight, which is unusual in NTU. One step at a time, I finally arrive at the Chinese temple – I mean, the Chinese Heritage Centre.

A walk in the park

NTU's "Shaolin temple" is actually the centrepiece of a nine-hectare heritage precinct that includes Yunnan Garden, a sprawling open space of greenery, waterscapes and heritage landmarks, complete with modern creature comforts such as Wi-Fi connectivity for all your Instagram stories. Built in the 1950s, Yunnan Garden has historical significance as the birthplace of Nanyang University, whose grounds NTU now occupies. In the recently rejuvenated garden still stands a replica of the distinctive arch at the entrance of the former Nanyang University. Hop over to the residential enclave of Jurong West Street 93 to see the original arch – you'll have an idea of how large the campus once was!

The bubble tea shops near Yunnan Garden need no introduction. Just look out for the snaking queues and you will find LiHO at the Singapore Hokkien Huay Kuan Building, or CHICHA San Chen at the South Spine canteen. I resist the temptation and continue my journey along the perimeter of NTU, arriving at the School of

Biological Sciences. Did you know there is a traditional Chinese medicine clinic in there that is frequented by the public? I wonder if the doctors there can find a remedy for my ailing grades.

Head for the hills

No such luck, so I huff and puff my way up one of the many steep slopes on campus – the ones that even the campus buses have difficulty surmounting. For you fitpos out there, this is a good spot for hill training. At the top of this slope is the National Institute of Education, which grooms future generations of teachers. Hidden in there is a trove of facilities you probably never knew existed, such as a ceramics studio and an art gallery.

My exploration takes me to the North Spine Plaza, where my iron will finally crumbles at the deluge of food options all round. My journey would have to continue another day. I make it a point to end my day's walk on a wholesome note. At the Boost Juice stall, I order: "One Skinny Dip, Original, please."

With my smoothie in hand, I take the Campus Loop back to my hall, observing every passing building. While NTU continues to wow with amazing new buildings like The Arc and The Hive, perhaps we should also pay attention to the older, overlooked buildings with stories to tell.



Sergul is an avid basketball player and a minor gym rat. He aspires to rid his procrastination habits, but let's talk about that another day!

HEY!
AR
SCAN THIS VISUAL
for a quick tip
here

HEY!
AR
SCAN THIS VISUAL
for a quick tip
here



FYI

NTU

ADVANCEMENT IN LIFELONG LEARNING POLICY
INDUSTRY CHANGE
WORLD COMMUNITY FUTURE
ONENTU VISION
SMART CAMPUS
VALUES IMPACT
TRANSITIONAL RESEARCH
TALENT COLLABORATION INNOVATION
PARTNERSHIPS COMMERCIALISATION EXCELLENCE
AMBITIOUS GRAND CHALLENGES
PILLARS
QUALITY INITIATIVES SOLUTIONS FOCUS
ECONOMY GRADUATES

HERE'S THE PLAN

NTU President Prof Subra Suresh recently introduced NTU 2025, the university's multi-pronged response to the accelerating pace of technology and the challenges we face in the post-pandemic world. Framed around NTU's core pillars of education, research, innovation

and community, the five-year plan involves a slew of new initiatives for students, staff, faculty and alumni and calls for a dedication to excellence, interdisciplinary collaborations and innovating for humanity.



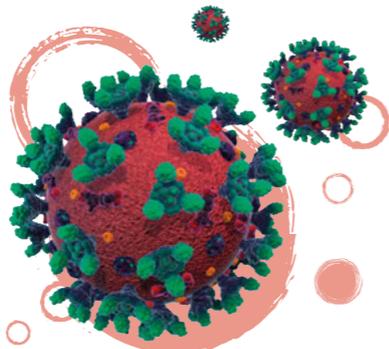
THE LOCKDOWN LOWDOWN

It's tough to put figures on the impact of the pandemic on our lives but a national survey released by NTU has done just that, with results showing a shift in workplace reality and expectations. Over 82% of respondents revealed their use of video conferencing tools increased, with nearly half experiencing fatigue as a result of this. Social isolation is an issue, however, with almost one in two admitting they have felt this "sometimes" to "often" in the last few months. Still, video conferencing looks likely to be here to stay, with 8 in 10 Singaporeans keen to have some form of work-from-home arrangement even after the pandemic is over.



HEY!
AR
SCAN THIS VISUAL to test yourself

CHECK HOW WELL YOU KNOW YOUR COVID-19 VACCINES IN THIS POP QUIZ



TALK OF THE TOWN

Have you heard The Final Whistle? Hosted by third-year communication student Deepanraj Ganesan, the weekly podcast has scored top spot in Spotify's national sports podcast league. Every episode tackles different aspects of the local football scene with guests like Fandi Ahmad and Hariss Harun, as well as NTU alumni Chris Yip-Au (below) and Anders Aplin.



Photo: Singapore Art Museum

ARTISTIC TRIUMPH

In a nod to the local arts scene and NTU's contribution to it, two alumni from NTU's art school received the prestigious National Arts Council Young Artist Award from Singapore President Halimah Yacob. Take a bow, Nicole Midori Woodford and Yanyun Chen from the Class of 2009. Current film students probably know Ms Woodford as a lecturer in NTU. She will also write and direct an episode of the Asian horror series, Folklore, for HBO Asia. Dr Chen, a visual artist, has contributed to pre-university art education in Singapore as co-author of an art teacher's textbook. She is also the founder of an illustration and animation studio.

HEY!
AR
SCAN THIS PHOTO to celebrate our accomplishment with us

WINNING REALITY

HEY! has been turning heads around the globe for its AR-some approach. The International Communications Consultancy Organisation (ICCO), a membership of public relations consultancies worldwide, presented the HEY! team with the In-house Digital Team of the Year title at the ICCO Digital Awards 2020. NTU was the sole Singapore

winner for creatively using augmented reality (AR) in the magazine. This was followed by two accolades at Marketing Magazine's Mob-Ex Awards, for Best Use of AR & VR and Best Use of Mobile Integration. Since its revamp in 2019 to include AR, HEY! has won nine international and regional awards for communication excellence. Thank you, readers, and scan on!



Care package

Caregivers are often seen as beacons of strength, and rightly so. But they face many challenges of their own and may bottle up their emotions. Aiming to provide an avenue for them to share their struggles is NeW-I (Narrative e-Writing Intervention), a cyber counselling app created by NTU researchers that lends emotional and psychological support to parents and caregivers of children with chronic and life-threatening illnesses. Through therapist-facilitated virtual writing sessions, the app gives parents a safe space to reflect on their journey and forge even closer bonds with their children. NeW-I is available for download from the Google Play Store and Apple App Store.

Fun fact: Li Xuan developed Hakkanese as part of an NTU typography course

HEY

WORD UP

It's hard to put art into words but that's what visual communication student Lau Li Xuan did. Her typeface design, Hakkanese, was picked by Dutch publisher Almenara Press to be part of their 2021 publication Trazos discontinuos. Li Xuan's design is a result of her research on the sound, tone and pitch of the Hakka language, as well as a reflection of its history.



THE PLANETEER

Adversity often gives rise to heroes, like Pothunuri Laya, who was one of 22 young changemakers from around the world selected as National Geographic Young Explorers for their efforts to take on present and future threats, including the pandemic. The NTU undergrad and serial innovator with a heart for the planet has received funding from National Geographic for her latest project on the viability of harvesting locusts, traditionally known as crop pests, as a food source.

DO YOU HEAR

From the aggravating sound of a wake-up alarm to the soothing strains of music, everything we hear during the day can markedly shape our mood and behaviour, say NTU's sound experts

Close your eyes, and listen. What do you hear? Did you notice it earlier? You're not alone if you didn't. Sounds do a good job in sneaking up on us, and telling us how to think and feel, without us knowing. We can measure it in decibels and hertz, but putting a figure on its influence in our lives is quite impossible.

Let's start from the time we wake up. Our phones briefly become our worst nightmare as they scream at us to get up for that early morning lecture. Do they need to be this harsh? Maybe not.

"Studies have shown that a melodic alarm, such as your favourite piece of music, is better at waking you up than the usual beeping sound. You can also set it so it gets gradually louder,"

says Prof Gan Woon Seng, whose noise-cancelling device for windows made headlines last year.

Asst Prof Ross Williams from the School of Art, Design & Media agrees, and reckons that we might be able to teach ourselves to be more receptive to gentler tones.

"Less unpleasant, or even nice, alarms and ring tones can work, if we can train ourselves to recognise them as wake-up calls. We have all internalised other default sounds, such as those that represent the arrival of a text message," says the sound designer and composer.

Next, we head outdoors and plug into our favourite playlist. Or maybe we decide to search for one on Spotify, where the first browsing category is "Moods & Genres".

All of us have different tastes when it comes to music. "It depends on what you've been exposed to and the associations you have developed from that," says Asst Prof Williams. But music can also take the lead in its relationship with us.

"Music engages the motor cortex in the brain, not just the cognitive, auditory and emotional regions. For example, strong rhythmic music makes you want to tap your foot or dance," he adds.

PhD student Gladys Heng, who researches how the brain processes music, thinks we listen to music for the emotional

WHAT

qualities it has. "Melodies and lyrics help us to express our feelings. We use music to de-stress, relieve boredom or increase excitement. Did you know most of us tend to pick sad songs instead of happy songs when we're feeling sad?"

Now it's lunchtime, when we face the perennial question – what to eat? So we imagine ourselves chowing down and that's how we decide on our meal. But is there more to it?

Oh yes, reveals Prof Gemma Calvert, a neuromarketing pioneer from NTU's business school.

"Speech sounds subconsciously connote sensory traits such as sweetness, bitterness, saltiness and other taste expectations.

So the names of the food you eat, including the food brands, provoke expectations in our minds. For example, French fries aren't French, but the sheer use of onomatopoeia – the crunchy sound of 'ch' which mimics the sound when you bite into them – and alliteration – where words start with the same sounds – make you start drooling for those tasty, crunchy little mouthfuls of potato."

With full stomachs and a tinge of regret, we trudge back to our hall rooms, hoping to dive straight into our books. As you resist melding into your bed, you can attempt to set a mood for studying by putting on music with regular beats, something "not too complex and preferably without lyrics", says Gladys. "Otherwise, listen

to music with lyrics in a language that is different from what you are studying, so as to reduce cognitive interference."

If you decide to go shopping, you're back at sound's mercy. There's nowhere to hide, even in far corners of the supermarket.

"Brands are increasingly looking to influence consumers through non-visual sensory channels as the visual environment becomes ever more cluttered. One supermarket in the US played soundtracks of either German oompah or French accordion music down the wine aisle as consumers shopped for wine. Depending on the type of music played, sales of German or French wine increased," says Prof Calvert. "What was most surprising is that none of the consumers reported hearing any music while they shopped!"



I HEAR?

HEY! SCAN THIS ILLUSTRATION for some soundbites from our everyday life





HEY!
AR
SCAN THIS PHOTO
to visit
Nadine at her
workplace

MRS PERSONALITY

It's easy to see how a robot can have a better memory than us, but what about one with better social skills? NTU's Nadine can read a person's face and gestures to predict intentions, and she can respond appropriately too. Her skillset has already landed her gigs at the ArtScience Museum and at insurance company AIA, where she worked as a customer service agent. Don't mess with her though, we're told she has quite a mouth on her.

SMIFF OF LIFE

The "best before" label would be obsolete in the robot world. Putting the human sense of smell to shame is an NTU-developed electronic nose that sniffs out spoiled food. Like a real nose but with superhuman sharpness and accuracy, it "smells" the gases produced by pieces of meat and quickly decides how fresh they are.



HEY!
AR
SCAN THIS PHOTO
for a whiff of
NTU's electronic
nose

RISE OF THE MACHINES

With the advancements being made in Artificial Intelligence (AI) and machine learning in NTU, how close are we to creating a human-like android?

SECOND SKIN, SHARP EYES

Once belonging to the sci-fi realm, cyborgs with exoskeletons have taken another step towards reality with a new NTU AI system that harnesses skin-like electronics and computer vision. Wearable transparent and stretchable sensors mark a sizable leap from previous-generation sensors that were bulky and had poor contact with users. The accompanying gesture recognition system is no slouch too, being able to reliably read signals from the sensors in dark and poor conditions.

THE HEALING TOUCH

Everybody hurts, including robots now. A made-in-NTU AI-based "mini-brain" gives robots the ability to feel pain. Not only can they tell where they have been injured, they can patch themselves up with an ion-gel material.

SAFE PAIR OF HANDS

Fresh from creating a robot capable of the hardest task known to man – assembling an IKEA chair – the NTU team responsible has rolled out a robotic arm with a soft touch. Christened "Archimedes" and one of the first in industrial trials to have both high accuracy and high agility, it is designed to pick up delicate optical products like lenses and mirrors and deposit them with sub-millimetre precision.



HEY!
AR
SCAN THIS PHOTO
to catch
Archimedes
in action

I CAN HEAR YOO

In between classes, NTU communication student Lee Yoo Jin lives her dream working with her childhood idols, Justin Ang and Vernon A of The Muttons

"I have been listening to The Muttons since I was 11, and I can't believe that I get to live this dream now every day," says final-year student Lee Yoo Jin, who started her job as a producer for Class 95's Muttons in the Morning six months ago.

"The only difficult thing was having to wake up before sunrise because the show starts at 6am, but I'm used to it now," laughs the Korean-born Yoo Jin, who moved to Singapore when she was five.

Working a lot behind the scenes, she suggests stories and ideas for the show, looking out for unusual headlines around the world, and compiles Hollywood news as on-air content.

Occasionally, she appears in front of the microphone, such as when The Muttons ask her to chime in on a topic.



"I went on air for the first time in August last year, after a full month of training. It felt incredible thinking there were thousands of people out there hearing my voice," she says.

NTU had a part to play in her foray into being a radio producer. NTU alumna Germaine Tan saw her emceeing an event organised by a local media company and asked if she wanted to work in radio. She jumped at the opportunity.

How have you managed to juggle school with your radio producer job?

I have my final-year project to complete, and have also taken a few modules that are Massive Open Online Courses. I also scheduled all my physical classes in the afternoon after the show. My friends know that I'm uncontactable after 10.30pm

as I keep to a strict sleep schedule!

How has your time in NTU helped you?

I was in the university's Emcee Club. I wouldn't have had the confidence to go on air if I didn't have all that experience speaking off-the-cuff without scripts as an emcee.

What is something about working in radio that most people get wrong?

Not many realise how much work a DJ puts in to make a great show. Each show is live, so there is no room for errors and everything moves at breakneck speed. There's also a lot of post-production work, such as editing show highlights, preparing special segments, liaising with clients and doing voiceovers for commercials.

Do you think radio is still relevant in today's world?

Radio is an industry that is unique in that the DJs interact with their listeners daily and develop relationships with them. We have listeners who call in and message us every day. It's amazing to see how The Muttons have such loyal fans who have followed them all these years.

Nicest compliment you received from a listener?

A Grab driver told me that the Muttons and I always start his mornings right. That was music to my ears!

What are your plans after graduation?

I would love to stay on in this job. I'll also pursue my other interests, such as emceeing, writing lifestyle articles, hosting YouTube videos and honing my digital graphics skills.

SAVIOUR FOR TROUBLED SKIN



Maskne getting you down? When applying layer after layer of pimple cream doesn't seem to work, some people turn to aesthetic treatments to do the job. Administered by doctors, such treatments that offer medical-grade therapy for skin woes have become increasingly popular in recent years.

One well-known method of combatting acne is the Q-Switched laser therapy. This is a non-invasive and painless laser treatment that uses photodynamic therapy to eliminate acne-causing bacteria and reduce skin inflammation. The result is clearer and healthier-looking skin.

For those plagued by acne scars, fractional skin resurfacing is an option. Here, microbeams of laser light are delivered into the lower layers of skin, stimulating a natural healing process that results in fast growth of healthy new tissue. There is minimal discomfort and no downtime.

At Imago Aesthetics, you can be assured that these aesthetic treatments are administered by licensed doctors who can advise you on the best treatment for your skin condition.

The Q-Switched laser therapy starts at \$58 while fractional skin resurfacing costs \$108 per session.

Visit imagoaesthetic.com.sg for more information and to make an appointment.



HEY!

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