Hey! Vol. 55 Sep - Oct '23

An Augmented Reality Magazine

Scan this page to join NTU student Charlize Su on exchange

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What's in your luggage?
Five people you'll meet in uni

Win
OneNTU Core Values tote bags and tumblers, BTS book, cake 'n' coffee, and more

Go Places
It all starts here
THE NTU HEY! AR GUIDE

Follow the trail of HEY! AR bubbles and brackets to uncover hidden surprises – including 3D objects and giveaways – within these pages.

PLACE 3D OBJECTS IN YOUR ENVIRONMENT

Put a new spin on things

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TAKE PART IN COMPETITIONS AND GIVEAWAYS

See the page transform into a video

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NTU HEY! AR Guide App Store, Google Play & AppGallery
Final-year student Charlize Su spent a semester on exchange at a Dutch university early this year, taking psychology and communication modules. Academics aside, she learnt how to cook and manage things independently. Now back in Singapore, she says living on her own gave her time to contemplate.

"With a change of pace, I had time to think about life and what I want to do. Living in Europe has made me consider working abroad in the future," she says.

Eating out in the Netherlands is expensive, so to save money I learnt how to cook. Meals were a team effort with my housemates; I picked up tips when we cooked together and tried different online recipes, even fusion cuisine. It was a learning journey, and it felt great to see my friends enjoy my food… So I think I’m a chef now."

Charlize Su
Year 4, psychology
Exchange in Erasmus University, the Netherlands
Currently on a semester’s exchange at Western Sydney University, third-year communication student Christalyn Tan chats with her friend, Jacob Loh, a computer science freshman who is curious about exchange.

**Message**

**Jacob**

Hey, haven’t heard from you in weeks! So what’s it like to study in an Australian uni?

**Christalyn**

I love how classes here are shorter hahaha. In total, I spend around seven hours in class – half of what I’m used to in NTU – although that’s also because my exchange uni only lets me take four mods. In NTU, I usually take five.

This means more time for me to get used to living here, go out and travel, and still be able to complete my assignments.

Okay, that’s nice. What kinda classes are you taking?

All four of my modules are related to advertising and public relations. It’s interesting to learn about these fields in the context of Australia.

While conceptualising an advertisement for my ‘Advertising: Creative’ module, I found out it’s common for locals to grab drinks in the ‘arvo’ (slang for afternoon), other than at night, which is more common in Singapore.

Meanwhile, in my ‘Crisis Communication’ module, I analysed the communication methods used by an Australian consulting company. I learnt that Facebook Messenger is more widely used than WhatsApp in Australia, unlike in Singapore where it’s the other way around.

**Message**

**Jacob**

Hmm that’s really different from NTU. Just entered uni, and I’ve already made so many friends from orientation and hall events...

How do you make friends then, especially as an introvert?

**Christalyn**

I got to know other international students from the uni’s networking sessions and Welcome Day. Afterwards, all the people on exchange just started introducing whoever knew to each other.

I also stay in my campus village (like NTU halls), which hosts community dinners where you can mingle with other residents. Btw, the dinners are free, very shiok.

**Message**

**Jacob**

I see. What about the uni culture there?

**Christalyn**

I love how classes here are shorter hahaha. In total, I spend around seven hours in class – half of what I’m used to in NTU – although that’s also because my exchange uni only lets me take four mods. In NTU, I usually take five.

Finally, always be open and accepting of others’ cultural differences. Nice, glad things worked out for you!

So did you guys travel together?

**Christalyn**

Yeah, we went to the Whitsundays, Tasmania and Melbourne!

**Message**

**Jacob**

YEAH! I think the most important thing is to trust that other exchange students are just like you and also looking to socialise, so don’t feel ‘paiseh’ to reach out to them first.

Even if they don’t reciprocate, you never have to meet them ever again, so there’s nothing to lose. After you meet them for the first time, remember to be proactive and intentional – a friendship isn’t built from a single text or outing.

A/fter you meet them for the first time, remember to be proactive and intentional – a friendship isn’t built from a single text or outing.

**Message**

**Jacob**

Yeahhh… during my first month, I was seeing new faces almost every day, which did get tiring. I’m glad I did though, because I’ve met some truly amazing people.

**Christalyn**

Ah okay, any tips on how to make friends? And FREE DINNERS???

**Message**

**Jacob**

So did you guys travel together?

**Christalyn**

Yeah, we went to the Whitsundays, Tasmania and Melbourne!
Jacob last seen recently

It was all right actually. From the start, we did talk about places we wanted to visit, so we could start planning early and get reasonable prices for flights and stuff. I would say that domestic flights are surprisingly expensive here though. If you or a friend can drive, it’s cheaper to rent a car and take a road trip.

Apps like Wanderlog and Splitwise are also good. Wanderlog makes collaborative itinerary planning easy, while Splitwise helps to automatically split the costs for a group.

Everything sounds great. But how’s Sydney? That’s where your uni is?

My school campus is in Parramatta South, which is a little outside of Sydney city.

Any snakes or spiders come and get u yet?

HAHAH THANKFULLY NOT. But wild cockatoos come to my apartment balcony looking for food now and then. Kind of like the monkeys in NTU lol. Other than that, Sydney’s been pretty nice!

There are usually two windows of opportunities per year. I applied at the start of this year to do my exchange in the first semester of the current academic year.

You have to “bid” for your preferred university within 2 tries, listing up to three uni options each time. If you fail to get even your third choice uni, don’t worry, NTU will assign you a university that will be a good match.

As for when you can go, I think it depends on your course, but most people go in Year 3.

Woah okay. I gotta work hard consistently from now on then, but I’m sure it’ll be worth it.

Hahah yeah, exchange is definitely one of the biggest highlights of being in NTU!
Final-year student reporter Bryan Kow, 24, says: “I was given a lot of freedom to work on my stories. I think being thrown into the deep end really taught me how to be resilient and what it means to be a journalist.”

For most students, it was their first time reporting overseas, and they had to navigate language barriers, cultural differences and working with people from less privileged backgrounds.

“I learnt more about the ethics of journalism. We couldn’t just photograph something as it was, but we had to think carefully about the impact of showing certain sides of their life,” says visuals editor Ryan Chiong, who photographed farmers and their families in the rural villages outside Kigali.

Rwanda on the rise
Rwanda was chosen as this year’s destination by journalism tutors Hedwig Alfred and Samuel He after hearing more than one speech by Singapore Prime Minister Lee Hsien Loong, who was in Rwanda last year, calling on Singapore-based businesses to consider setting up shop there.

The 1994 genocide of the Tutsis, which claimed more than half a million lives, is remembered everywhere in Rwanda. Its people cannot forget that painful part of their history but have gone on to rebuild a new home for all.

Aditi Bharade, 22, said students are spoilt in Singapore because they can easily reach people through email and text messages. “But being there really taught me to go back to the basics of journalism, such as finding people on the ground rather than relying on social media to get information I needed.”

The country has moved from strength to strength economically and politically, and though small compared to its neighbours, is markedly clean and safe. Some people describe Rwanda as the Singapore of Africa.

Almost stranded
The journalism students had to get used to travelling long distances to get to people they wanted to interview in the highlands and farmlands of Rwanda.

Ivy Chok, 22, got stuck at night near the Volcanoes National Park while working on a story about farmers living near wildlife. The driver’s car key broke in the ignition.

“We were in the middle of nowhere. My phone did not have data, it was getting colder and pitch black, and we did not know what to do,” she says.

Eventually, a passing truck gave them a mechanic’s number. The man arrived to fix the lock and Ivy returned safely to Kigali by 11pm, two hours later than planned.

Adapt and learn
The students also had to learn to work with translators. A few newsmakers could only speak Kinyarwanda, one of Rwanda’s national languages, so translators had to accompany the students for interviews.

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Every night, the students met with the tutors to discuss their progress and to plan the next day’s activities. The tutors often joined the students on their assignments too.

Ms Alfred, the school’s journalism department lead, said the students did well in their new environment. “I was impressed at how they adapted to the way things work in Kigali and its outskirts, how they jumped on motorcycles to get from place to place and got Rwandans to talk to the foreigners from Singapore,” she says.

Now back home, the students’ stories are completed and some have been published in The Straits Times, The Business Times, tabal! and South China Morning Post.

Print editor Ervin Ang, 24, says: “Although we were delivering only two to three articles each, there was a lot of work behind the scenes. But on the good side, the experience you get is once in a lifetime.”

Eunice loves burning vanilla-scented candles and discovering the latest cultural events. When she is not busy chasing deadlines, you will find her curled up in bed with a fantasy novel.
LEARNING TO EAT LIKE A LOCAL

Hey! student writer Bernadette Toh takes Ukrainian exchange student Yegor Holikov on a campus food tour to eat like a true-blue Singaporean.

Nothing brings people together more than food. Especially in Singapore, billed as a foodie’s paradise. Whenever friends from abroad visit, I’m always ready to introduce them to my must-try local dishes. I showed Yegor, 23, some of my favourite eats in NTU and asked him to guess what they are.

1. **CHAR KWAY TEOW**
This dish is not entirely foreign to Yegor. As he is a postgraduate student in Taipei’s National Yang Ming Chiao Tung University on exchange here, he has lived in Taiwan for a few years and has come across similar dishes.

“It’s different from the noodles I have tried before, which are usually thinner and longer,” he says.

Char kway teow is a wok-fried noodle dish with roots in Teochew culture. Flat rice noodles are stir-fried over high heat with light and dark soya sauce, garlic, chili, egg, fish cake, Chinese sausage and beansprouts.

Yegor tried the version from NIE’s canteens, which came with both fresh prawns and chicken meat.

He was pleasantly surprised by the wedge of lime served with this hawker classic, meant to be squeezed over the noodles.

“I’m a big fan of citrus. I love anything sour, so it’s definitely a plus for me,” he says.

2. **NASI AYAM PENYET**
Who would have thought that nasi ayam penyet would remind Yegor of Eastern European food?

“Whenever I saw the fried tofu, I was wondering if it was cheese,” he says.

Nasi ayam penyet is an Indonesian dish. The fragrant fried chicken is smashed with a pestle and mortar to make it softer. It’s typically served with rice, cucumber slices, fried tofu and sambal.

The nasi ayam penyet from the Nanyang Crescent Hall canteen that Yegor tried the last meal of his NTU food tour was waffle with kaya. He tried the one with rice, cucumber slices, fried tofu and sambal.

“I can taste the different flavours and spices,” says Yegor, who is studying visual arts at NTU’s School of Art, Design & Media.

“I really enjoyed today’s food because it’s sweet and bitter at the same time.”

3. **KOPI PENG**
Yegor usually gets his caffeine fix from espresso-based drinks at North Spine’s Venture Drive Coffee, so kopi peng is unfamiliar to him.

Kopi peng is local iced coffee with condensed milk. It is made from robusta coffee beans roasted with sugar and margarine under high heat to caramelise the beans. The ground coffee is then mixed with hot water and strained through a sock.

“It’s like a mix of hot cocoa and coffee to me,” says Yegor. “I like it because it’s sweet and bitter at the same time.”

4. **WAFLE WITH KAYA**
And last but certainly not least, dessert.

Yegor’s last meal of his NTU food tour was waffle with kaya. He tried the one at Nanyang Crescent Hall canteen that is made with pandan.

“This looks like a Belgian waffle, but it’s green,” Yegor says. “Belgian waffles are crispy. Here, they are softer.”

A waffle with kaya is an Indonesian creation. It is typically made with pandan and sugar and margarine under high heat to caramelise the beans. The ground coffee is then mixed with hot water and strained through a sock.

The kaya spread in his waffle was kaya, the same coconut jam found in kaya toast.

He added that the waffle was not too sweet and paired perfectly with his kopi peng.

“Dessert definitely won my heart,” says Yegor with a laugh. “Or you could say, won my stomach!”

A FOOD HAVEN

“I really enjoyed today’s food because I can taste the different flavours and different spices,” says Yegor, who is studying visual arts at NTU’s School of Art, Design & Media.

When it comes to food options, we’re certainly spoilt for choice.

“It never gets boring,” Yegor adds.

There are many more dishes that Yegor has yet to try on our campus, which is home to 16 food courts and 30 restaurants and F&B outlets. What would you recommend to him for his next local food adventure?
ADVENTURES ABROAD

Come to NTU for global adventures

Live, lab, love.

Entrepreneurship internship in the States

Weekend trip while on exchange in Scotland

From boardroom to slope session.

Entrepreneurship internship in Thailand

Leadership symposium in Thailand

Semester in Sweden

Swede dreams (are made of this).

To magical places with friends.

The tip of the iceberg of my NTU experience.

Conducting health screenings for women and their children.

Leadership symposium in Thailand

Entrepreneurship internship in the States

Tech-ing coding up a notch.

Internship in Switzerland

Research internship in Switzerland

The tip of the iceberg of my NTU experience.

To magical places with friends.

The tip of the iceberg of my NTU experience.

To magical places with friends.

The tip of the iceberg of my NTU experience.
We ask Sophia Riaz, a mathematical & computer sciences freshman, and Riyadh Al-Muttaqin, a final-year sociology student, to show us their must-haves for school.

Tote bag
Functional and practical, this is perfect for carrying all your university essentials and doubles up as a grocery bag too.

Claw clip
The quintessential 90s hair accessory is back in trend. Chic and effortless to wear, it keeps your hair out of the way when you’re moving about.

Notebook
The traditional pad is still Sophia’s notebook of choice. She finds it faster and easier to take down notes and formulae – and to doodle – with pen and paper.

Rechargeable fan
A great way to stay cool and comfortable in hot, humid weather.

Japanese fan
It’s back to basics when the electric fan’s battery goes flat. Sophia’s stylish hand fan is a souvenir from her pre-university family trip to Kyoto.

Medicine bag
Always prepared, Riyadh keeps this packed with useful items like antihistamines, paracetamol, lip balm, tissue and more.

Reusable cup sleeve
Lightweight and portable, this is handy to have as the fabric absorbs condensation from Riyadh’s fave ice-cold drink and protects his hand when the beverage is piping hot.

Tumbler
Staying hydrated is easy with plenty of water coolers around NTU. Riyadh’s flask spots a Pokémon-like character sticker designed by a friend.

Film camera
Say cheese! Some of your best memories are made in university and Riyadh hopes to immortalise these cherished times.

Staying hydrated
There’s always something happening on the NTU Smart Campus, but sometimes you need to drown out the hustle and bustle to focus on your work.

Snap camera
I got this while on exchange in Canada and I now take it to class to snap photos of my friends.

NTU Smart Campus
There’s always something happening on the NTU Smart Campus.
Take inspiration from how your profs prepared for exams when they were students (and discover the science of why their methods work)

My favourite study tip when I was a student:

"I studied in cafes and coffee shops as the background noise and the people milling around helped me to concentrate."

Why it works:

There is evidence that ambient noise, for example, the sounds of people chatting and the whir of the coffee machine, may improve concentration in some people and even boost their productivity. This is because background noise can mask distracting sounds, which helps you stay focused on the task at hand. According to science, whether or not such noise distracts or helps during study sessions may depend on your personality. Extroverts, take note – this method might work well for you.

Studies have found that there is a memory advantage to saying words out loud versus saying them in your head. It’s because the act of speaking and hearing yourself helps you remember better. This phenomenon of learning by doing, dubbed the “production effect”, speeds up what you put into long-term memory.

Repetition of information reinforces connections between nerve cells in the brain, which helps us remember new material. For better recall of the information in the long term, psychologists recommend spacing out study sessions instead of cramming intensively. Being actively engaged in learning such as by asking questions also activates the brain to process and store new information.

My favourite study tip when I was a student:

"Rehearse the information you are trying to learn out loud instead of just reading it silently."

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Dr Lucy Victoria Everett Width Assistant Dean (IYear 1 and Year 2), Lee Kong Chian School of Medicine

Assoc Prof Jung when he was a postgraduate student at the University of Southern California in the US.

Assoc Prof Leong when she was a junior research fellow at the University of Cambridge in the UK.

Assoc Prof Victoria Huyghe, School of Social Sciences

Assoc Prof Vyas with sugarcane plants
Every Monday, Daniel Tan attends a morning meeting, plans his week’s schedule, and works on his projects, before wrapping up his day after a scrum meeting with his supervisor.

But unlike any other internship, Daniel, a third-year NTU computer science student, plays the role of a “hacker” during his eight-month stint with local cyber security company Ensign InfoSecurity.

He is part of a group called the “red team” that runs “penetration tests” to find bugs and vulnerabilities in clients’ websites and networks that can be exploited by hackers.

“Before the internship, I’d never conducted testing on an actual website,” says Daniel, who only had experience finding bugs in test websites such as those in hacking competitions and computer science classes in NTU and polytechnic. “But now, I’ve gone through the complete testing process. It’s an eye-opening experience.”

There is also an urgency in the tests as he needs to find security gaps before cyber criminals exploit them. A similar gravity pervades the work of other NTU students in cyber security stints.

Ms Serene Yeo, Vice President of Human Resources at Ensign InfoSecurity, says that the NTU interns with the company “bring fresh perspectives and ideas” and contribute to “meaningful and impactful work”.

Cyber attacks on critical infrastructure can cause great harm. For instance, in 2021, hackers shut down a major pipeline supplying almost half of the fuel for the United States’ East Coast, causing an airline fuel shortage and panic buying at gas stations.

This made the work of NTU student Don Lim during a recent two-month internship at Singapore power-generation company YTL PowerSeraya much more crucial.

Don realised that when third-party vendors are engaged to update systems that control power generation, there is a risk that hackers may infiltrate the vendors and piggyback on them to breach a company’s critical systems.

“If the power generation systems are attacked, they can’t just be shut down to deal with the attack because energy production needs to run 24/7,” explains Don.

To ensure any cyber attacks through vendors do not even reach these crucial systems, Don proposed to safely test update patches on virtual recreations of the systems. This could confine attack attempts to these replicas without risking the actual systems.

Monitoring cyber threats has its challenges. NTU student Lee Zhiyong, who is on an eight-month internship with local information technology services company NCS, helps to look out for threats its customers may face.

When a security issue is flagged by NCS’s systems, Zhiyong must quickly assess if it is a genuine threat so that incident response colleagues can swiftly step in to contain the problem if needed.

Keeping up with the fast-paced nature of his work was initially difficult for him. But he got up to speed after reading up on his own and learning from his colleagues.

Potential threats he has encountered include suspicious users going through foreign IP addresses – instead of Singapore ones – to access the systems of local customers. It is then a race against time for Zhiyong to establish the facts of these flagged cases promptly.
CAREER BOOST

Zhiyong chose the threat monitoring internship because he sees it as a stepping stone to becoming an incident responder in future and possibly working in digital forensics, which seeks to understand how a cyber attack happened.

“I’ve always wanted to be a detective and being in cyber security allows me to be like a sleuth solving puzzle-like challenges,” he explains. Reading about big corporations getting hacked in the news spurred him to learn how to keep digital spaces safe as well.

Zhiyong says his NCS stint gave him a better idea of the professional certifications he needs to boost his career prospects, adding: “The internship reaffirmed that cyber security is the right path for me.”

Besides technical skills, Zhiyong also picked up communication skills, such as learning how to communicate clearly and quickly about time-sensitive issues.

Don’s time at YTL made him even more interested in cyber security than before. He first encountered the topic when a Minecraft video game server he hosted for friends was hit by a suspected cyber attack.

“I thought cyber defence was about protecting one computer system in an organisation and keeping hackers away,” says Don. “But I realised there are actually many linked systems that need defending, which I found very interesting.”

“Even though I was just an intern, YTL was open to hearing my suggestions on how the company’s systems could be protected,” he adds. “My supervisor also gave me the opportunity to join meetings with vendors and attend an industry seminar, which exposed me to even more real world cyber security scenarios and applications.”

Some employers support their employees in getting certified. For NCS, its talent programme for university graduates has a cyber track that sponsors professional certifications.

In Daniel’s case, even though he is an intern, Ensign assisted by covering the examination fee for one of his certifications in web application penetration testing.

“My managers were very supportive and encouraged me and the other interns to pursue the certification. They gave us time to practise and take the exam,” adds Daniel, who took on the Ensign internship after speaking with the company’s staff at a career fair organised by NTU’s Career & Attachment Office.

FOOD FOR LESS

Sumptuous eats at a fraction of restaurant prices, right here at NTU

**Xia long bao**
$4.80 FOR 6 PIECES
Wonderful Café, Canteen 2

If perfection could fit between a pair of chopsticks, this would be it. Freshly steamed to order, a basket of these tasty soup dumplings will lift even the dullest of spirits.

Delicate pleated dumpling skin, flavourful broth, juicy meat and generous (DIY) portions of sweet vinegar and ginger slices? Green flags everywhere.

Not to mention that these morsels are only half the price of their doppelgangers in Din Tai Fung.

The dumplings are very good quality for the price. I really like their fried lamian (wheat noodles) too.

Simon Jensen
Civil Engineering, on exchange from Denmark

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21
Spicy ramen
$6.70
Kiso Japanese Cuisine, Canteen 11
Sometimes all you need is a nourishing bowl of ramen. Enter this humble stall that gives Ippudo a run for their money.
The spicy ramen’s base is a full-bodied tonkotsu broth topped with fragrant Japanese chilli oil. The ramen noodles are al dente and delightfully springy, pairing well with the thick slices of smoky glazed char siu, which are equal parts lean and fatty.
Sipping up the entire bowl of ramen with its crunchy slivers of black fungus is easy, as the broth is savoury without being too salty or oily.
Other notable dishes here (each under $7) include the Japanese curries and the chicken chop dry ramen, which boasts a sizeable piece of fried katsu, an egg and fragrant chilli minced meat sauce.

“The ramen noodles from this stall are nice and springy. On some days when I’m tired or didn’t do well on my quiz, having yummy food like this invigorates me.”
AIDAN LING
RENAISSANCE ENGINEERING PROGRAMME

Brownie
$2 OR $1.50 WITH A MAIN
The Tea Party, The Arc
Looking for a post-lunch treat? Say hello to The Tea Party’s brownie.
This dense, fudgy square can easily cost two or three times more in a swanky café. Finessy pastry lovers may be pleased to find that the chocolate used is dark and doesn’t taste like “cheap chocolate”. The crackly top layer adds welcome texture.
The café offers a $5 teatime set of a brownie or scone with a coffee. Pro tip: Let the brownie, which is served chilled, warm up to room temperature for a truly heavenly experience.

“The brownie is delicious with a scoop of ice cream. The portion size is just right as dessert after a meal.”
CHEN SZEYI
SOCIAL SCIENCES

Mixed fruit tartlet
$4.80 FOR 2 TARTS
June’s Breathe Café, Experimental Medicine Building
Treat yourself to a leisurely meal in this cozy nook of a café. Overlooking an expanse of green, the eatery is a relaxing respite from the hustle and bustle of NTU’s academic complexes.
Aunty June’s mixed fruit tartlet boasts a juicy array of fresh fruits like kiwi, blueberries and strawberry on a light, creamy custard. The homemade tart crust is buttery and slightly nutty with a good bite.
Reminiscent of fancy high tea, their seasonal cakes come in interesting flavours like ondeh ondeh and yuzu osmanthus. Other popular items include the chunky banana cake ($2.50), cream puffs and quiches.

“The fruits are really fresh. The pack of two tarts is attractively priced. Since the tart is not too sweet compared to a slice of cake, I don’t feel guilty after eating it.”
SUJASHA GHOSH
BIOLOGICAL SCIENCES
**Gyudon**

$9

Connect71 Café, NTU Innovation Centre

The beef bowl in this café is a colourful departure from the gyudon in a typical Japanese restaurant. Apart from the thinly sliced beef and onions simmered in a mildly sweet sauce and fluffy short-grain rice, you can tuck into an onsen egg, edamame, purple pickles and a smattering of nori seaweed strips. Each bite is well balanced with every ingredient working harmoniously.

Cosy and minimalist, this alumni-owned café is a popular spot to unwind with friends over an iced matcha latte or catch up on readings.

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**Pinky pasta**

$8.50 WITH A FREE DRINK (iced lemon tea or water)

The Tea Party, The Arc

Pasta options are plentiful on campus. What sets this dish apart is its secret sauce—a concoction of beef bolognese spiced with cream and topped with sausage slices and mozzarella cheese—on flat linguine noodles.

All mains come with a free drink here. The slightly bitter iced lemon tea helps to cut the richness of the pasta. Another hot favourite is the café’s 220g steak and mash ($11.90), with the sirloin beef done the way you like it.

The café frequently runs short-term promos. For example, you can get a free brownie with a main, re-order discounts (up to 10% off), exam week sets and more. No wonder then that it’s packed during peak hours—plan your trip with care.
FROM WASTE TO ENERGY

Perhaps the answer to a more sustainable planet is thinking outside the (used) box. See how NTU scientists are using junk in ingenious ways to fuel our world.

ORANGE PEELS ➔ PRECIOUS METALS
On the NTU Smart Campus, food isn’t just fuel for us, it’s also juice that powers up the environment. Citrus peels that are normally discarded can be used to turn old batteries into new ones. The dried citrus peels are ground up into a powder and combined with citric acid to extract and reuse precious metals from spent lithium-ion batteries to create brand new ones. This method is an environmentally friendly alternative to the harmful chemicals and high temperatures used in common battery recycling processes. Plus, 90% of precious metals were extracted from the old batteries, comparable to current approaches. Now that’s a-peeling.

TAMARIND SHELLS ➔ ELECTRICAL CONDUCTORS
A quintessential tropical fruit, tamarind is a key ingredient in dishes like assam prawns and pad thai. The shell of the pod-like legume need not be thrown away during food production, since it can be used to conduct and store electricity. This is done by exploiting the rich carbon makeup and porous nature of the tamarind shells, turning them into extremely thin sheets that can conduct electricity in energy storage devices for cars, trains and lifts.

OLD SOLAR PANELS ➔ SILICON FOR BATTERIES
Ever wondered what happens to expired solar panels? They get thrown out, just like most obsolete hardware. Now there’s an efficient way to save them from the incinerator. The solar panels are simply soaked in phosphoric acid – a substance commonly used in the F&B industry – twice to achieve a high recovery rate of silicon and at a higher purity. The process is more sustainable and cheaper than existing methods of recycling. Even better, the high-quality silicon recovered is good enough to be used in lithium-ion batteries that power electric vehicles.

PLASTIC ➔ CLEAN FUEL
We all know that plastic can cause huge pollution problems. But life with plastics may become less problematic – with some fantastic ideas to turn them into fuel.

One team took marine litter collected from local waters and converted it into hydrogen and carbon products for clean electricity generation.

Another team developed a chemical process that uses light and a catalyst to break down the stubborn polymer bonds of plastics. Acids formed during this eco-friendly process can be applied in the production of green fuels such as hydrogen.

WASTEPAPER ➔ CARBON FOR BATTERIES
Don’t discard your used paper bag just yet, since cheap wastepaper can be turned into crucial battery parts – all while releasing hardly any greenhouse gases.

Wastepaper is cut into smaller pieces and exposed to high temperatures, reducing it to pure carbon anodes, which are essential electricity-storing components in batteries.

HEY! SCIENCE & TECH
Junn Loh  Vivian Lim  Hanafi Ramdan

TO SEE WHAT OTHER TRASH NTU SCIENTISTS HAVE TRANSFORMED INTO TREASURE

SCAN THIS VISUAL

SCAN THIS PAGE

SCAN THIS VISUAL
THE FIVE PEOPLE YOU’LL MEET IN UNIVERSITY

THE BESTIE FOR LIFE
This is the person you randomly sat next to in your first-ever tutorial. “Hey,” they said, and things just picked up from there. Before long, you cease to exist as individuals. You’ll be joined at the hip – sometimes literally when on the campus shuttle – and people will ask, with genuine concern in their voices, if they spot either one of you in school without the other, whether everything is okay.
The two of you get exhausted looking at their social media accounts, because you can’t figure out how it’s humanly possible to know so many people.
Their Instagram stories are so numerous, they don’t show as a series of lines at the top of your screen but appear as dots instead.
You wonder how they find time to study, but realise they’ll have no problem charming their way into internships and job offers.

THE SOCIAL BUTTERFLY
This person is everywhere, knows everyone, and can link you up with anyone. They’re at all networking events and, like a butterfly flitting from flower to flower, often around the corner when you least expect it.
If you need to find someone, or have an in to the hottest party in town, the social butterfly is only a quick DM away.
You sometimes get exhausted looking at their social media accounts, because you can’t figure out how it’s humanly possible to know so many people.
Their Instagram stories are so numerous, they don’t show as a series of lines at the top of your screen but appear as dots instead.
You wonder how they find time to study, but realise they’ll have no problem charming their way into internships and job offers.

THE RESUME WARRIOR
Forget Instagram and TikTok – LinkedIn is this person’s social media of choice, which you’ll be asked to connect through within five minutes of meeting. If they have a TikTok account, it’s all about the hustle and the seven things all successful people do.
You don’t think this person knows the word sleep.

THE INTERNATIONAL FRIEND
NTU is many a foreign student’s top choice for exchange, and who can blame them? Spending a semester or two at one of the world’s most beautiful campuses is a definite plus.
This is the pal you’ll gladly share your favourite hawker fare with, teach Singapore slang to, and bring to spots only true-blue locals know about.
They’ll use “lah” with unintended comic effect when they speak, but at least they try. The Singapore imprint will be so strong they’ll order Tiger beer in their home country.

THE COOL PROF
This is the prof you mistake for another undergrad when they walk into class, until their laptop settles in full view of everyone and you realise this is a fully functional academic and your teacher.
Somehow, this prof is able to hold regular office hours, mentor three PhD students and reply to your panicked 11.59pm email three seconds later when your assignment isn’t uploading.
You sign up for every one of their classes because you’ll learn both the intricacies of your academic major and valuable life lessons along the way.

THE WORKAHOLIC
During the semester, they’re juggling five classes with two part-time internships, building a startup, and being President of three clubs.
While you were at the gym or hanging out at cafes, they’ve somehow racked up nine internships in four years. You suspect their blood is 90% caffeine at this point.

You wonder if it’s even legal for a professor to be this cool – surely, as a matter of fairness, academic genius must be balanced out with social awkwardness. But no – the cool prof is also funny and warm, and has an impressive “fan club”.
They will guide you like a parental figure, give career advice, and mentor you as you attempt to exist as best you can in the 21st century.

You’ll feel bad asking them to write a last-minute reference letter for a job interview or Master’s application, but they’ll be so nice about it you start believing in the goodness of humanity once again.
How made-in-NTU technologies are changing our future

Hot discovery

NOW
Singapore could be a hotbed of renewable energy. In Admiralty, NTU scientists discovered granite below the earth that is sizzling with geothermal potential. Drilling more than 1.1km underground, they found temperatures there hot enough to make tea and coffee. The team estimates that the rock at a depth of 5km could be as hot as 200 degrees Celsius. If unlocked, this energy could power everything from your iPhone to that steamy onsen you’ve always wanted.

FUTURE
Imagine piping that underground heat right up to your home. Your natural “oven” could be tapped to power up your robot personal trainer and provide hot water. Used on a bigger scale, geothermal energy could cool skyscrapers and charge electric cars. Since it has almost zero carbon emissions, this clean energy source will also help Singapore achieve its target of being carbon neutral by 2050.

Cabbage to cream

NOW
Who knew that the forgotten kale in your fridge could one day become your next face mask? NTU scientists are mixing alchemy with agriculture, transforming kale waste into health supplements and beauty products. Right now, extracting phytochemicals, the protective compounds in plants, requires high temperatures and releases greenhouse gases that make our planet warmer. With NTU’s new earth-friendly technique, beneficial antioxidants and lutein can be extracted from plants more efficiently.

FUTURE
Whip up health and beauty products from your unconsumed greens with ease. In fact, agricultural waste from different plant parts, including fruits, can be turned into eco-friendly products that boost our health and looks while reducing our carbon footprint. A beautiful win-win.

Unfolding the future

NOW
NTU scientists have not only 3D-printed satellite components, but incorporated shape-memory materials that “remember” and change their shape when exposed to heat or low temperatures. Of NTU’s three latest satellites in space, one has 3D-printed parts and shape-changing materials, while the other two feature new solar tech and sensors for observing the sun and the Earth.

FUTURE
Create a satellite from a 3D printer for any space mission you fancy, be it to snap photos of the moon or make a phone call from Mars. Using flexible electronics and shape-memory materials, scientists can create “cosmic origami”. Picture a space-saving 3D-printed satellite that unfolds and deploys its solar panels and antennas on demand in space, making it possible for more instruments to be packed in the same rocket before launch.
**SCENE**

“Dr Sureenate is especially patient and warm when teaching Thai. She readily shares her LINE number for any queries. In addition, she provides us with snacks and Thai tea, so we have a true authentic Thai experience. Her lessons are very engaging and she is really forthcoming.”

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**TECH TITAN IN THE MAKING**

NTU undergraduate Zhou Xuanle has been named in the Singapore Computer Society’s 50100 Women in Tech list that spotlights role models in the STEM sector. The mechanical engineering major was in the NTU team that won two awards at the Shell Eco-marathon last year and part of the NTU trio that finished second at JTC Corporation’s Future of Mobility Case Challenge earlier this year.

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**DISCO TECH**

Do you have two left feet? Don’t worry, an NTU student might just be able to turn you into Fred Astaire or a K-pop idol! In collaboration with Microsoft, PhD student Tan Wang created a model using artificial intelligence to turn a still image of a person into a master of the dance floor. Named DisCo, the model was trained with around 900,000 generic images of people on TikTok and about 350 dance videos to learn how people move while dancing.

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**TOKYO DRIFT**

Give it up for Cheng Jiaxiang! The PhD student’s research paper on a new deep learning-based method for prognostics and health management, authored with a team of industry experts and professors, took the Best Paper Award at an engineering conference in Tokyo.

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**AN ODE TO SINGAPORE’S HISTORY**

Before emails and messaging apps, people would send postcards and letters in the mail. Imagine that! This slice of history is just one aspect of life for the pre-Internet generation (aka your mum and dad) that was showcased in an NTU Museum exhibition, Sites & Nature: A Collection of Remembering, which told the story of Singapore’s urban and natural development through artworks, artefacts, furniture, plants and materials.

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**SECRET GARDEN**

A Supertree in Yunnan Garden? Yes, it’s reality – virtual reality. Inspired by HEY’s refreshing use of augmented reality and a visit to NTU to find out more about the magazine, Canadian educator Dr Andre Plante created a virtual garden that shares Yunnan Garden’s unique layout, and contains landmarks such as the Merlion and a Supertree. Dr Plante, who has three decades of experience in higher education, uses the virtual space to familiarise students with design tools and principles.

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**THE TOLL OF MENTAL HEALTH JOKES**

There’s no humour in joking about mental health, even if it’s done in a light-hearted manner, says an NTU expert. Referencing a trend on TikTok where creators pose as mental health professionals and leave comments on videos like “See me in my office” and “Remember to take your prescribed medication”, the social psychology researcher says that these could trivialise mental health issues.

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**Recipe for victory**

If you like gaming and food, you’ll want a bite of this. A duo from the School of Art, Design & Media designed a game around our two Southeast Asian staples such as nasi lemak, mango sticky rice and ondeh ondeh. The game clearly hit the spot with judges at the SEA Game Awards in Kuala Lumpur, where it won Best Student Game.

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**FYI**

Dr Derek Rodriguez

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**HE Y!**

Students and graduates from the School of Art, Design & Media have a chance to win this groovy bestseller for a chance to win a trip to Phuket, Krabi and Phi Islands worth $1,500 in the last issue of HEY! by sending us your entry for “An ode to Singapore’s history”.
There, she patiently waits beside bed. Most people are still curled up in instance, is up in the wee hours of PhD student Regine Tiong, for to preserve nature’s wonders. Instead of working in air-conditioned to come rain or shine, early or late. Are passionate about protecting came before them, today’s youths of rare and exotic wildlife, and NTU students are braving the world.

More than the generations that came before them, today’s youths are passionate about protecting the environment. But some NTU students are taking it a step further, come rain or shine, early or late. Instead of working in air-conditioned comfort, they are rolling up their sleeves and venturing into the wild to preserve nature’s wonders.

PhD student Regine Tiong, for instance, is up in the wee hours of the morning at the beach, while most people are still curled up in bed. There, she patiently waits beside the sandy nests of critically endangered hawksbill turtles until the turtle hatchlings break through their shells and head for the sea. She then collects the unhatched eggs and broken shells, and takes them back to her lab in NTU where she studies the genetic diversity of these turtles, as having good diversity indicates how they can better adapt and survive in different environments and against diseases. The hope is that through these studies, scientists can figure out how to best safeguard these animals, whose numbers have fallen sharply in over a century.

“The project aims to help the conservation of the hawksbill turtle,” says Regine. “It’s fascinating that we find them nesting in Singapore. Beaches here are man-made or reclaimed, and are narrow with heavy human traffic. Yet they still choose to nest here. This gives us the opportunity to protect them.” For insect whisperer Calvin Leung, who studies ecologically important insects that live in wood-called saproxylic insects, collecting the critters for research is “quite tedious”, he says. The PhD student goes into the woods every week and a half to collect samples, taking segments of logs from the forest floor to bring back to the lab, where he dissects them and picks out insects like beetles, ants and termites. At the same time, he sets traps in the tree canop
ty to catch flying insects.

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**TURTLE TRACK**

**As a child, Regine Tiong dreamt of being a vet. Then turtles came into her life. She began her relationship with them as an undergraduate at NTU’s Asian School of the Environment. Through a programme offered by Singapore’s National Research Foundation, she spent a month in a research institution in Cyprus studying green turtles (main picture) and loggerhead turtles.**

Watching turtles come up at night to lay their eggs, and finding and protecting the nests while waiting for the eggs to hatch, affirmed her mission to help turtles. This led to her studying the genetics of the hawksbill turtle as her final-year project. After she graduated, she convinced Asst Prof Kim Hie Lim, her final-year project supervisor, that developing the hawksbill turtle’s reference genome, and using it to study their population, was worth pursuing as a PhD project.

“She saw potential in this, the first such study at that time, which I’m very grateful for,” says Regine, who now works with NParks to monitor turtle nests on beaches in East Coast Park, Sentosa and Sisters’ Islands, including at the hatchery on Small Sister’s Island. Apart from contributing to science, she hopes to raise awareness of turtle conservation in Singapore.

“When I started, many Singaporeans didn’t even know we have turtles here. I think this project has created awareness about them. Being in NTU has also given me access to high-quality genomic data, strong sequencing teams and high-tech equipment that other turtle researchers might not have.”

“Moving forward, I hope to collaborate with researchers around the world who do not have the same resources, by helping them to sequence turtle DNA with samples they have collected.”

**BEETLE MANIA**

“Bugs don’t bug Calvin Leung. The PhD student wants to cross paths with saproxylic insects – insects that live in wood. Part of his research is finding out how the saproxylic community is recovering over time in younger forests in Singapore. To do this, he compares the diversity of saproxylic communities he collects from log samples in forests manually restored in the 1990s and secondary forests – forests assumed to be regrown after World War II – against those he gets from primary forests, which are more than 150 years old.”

The budding taxonomist is almost certain he has discovered a new species of beetle too.

Says Calvin: “Earlier this year I found some stag beetle larvae. Usually these are quite huge. But the ones I collected were just about three millimetres long. They look like they’re from a very primitive lineage of stag beetles, not like the ones we are familiar with. It must be a new species. We just have to go through some procedures to confirm it.”

Another rare insect he has collected is the longhorn beetle. Coincidentally, within Singapore, this beetle has only been found in NTU, in the forests next to Nanyang Crescent.

Almost every time he goes into the field, rain clouds won’t be far behind. His “rain curse” means toughing it out in wet conditions is par for the course.

“It rained a lot in Hong Kong when I was doing fieldwork there. And when I was in Nepal in summer, I looked up and there was a snow cloud above. And some weeks ago, in Bukit Timah forest, it started raining, so I waited it out and went back when the rain stopped and the clouds dispersed. But after setting just two traps, I heard thunder and then lightning struck a tree nearby, so I ran for my life,” he laughs.

But it’s all worth it – Calvin says the saproxylic ecosystem is an exciting one, with a single piece of log housing hundreds of critters.

“Some feed on wood, some are predators, some can be future pollinators, and others use it as a hotel. I want to know about their evolutionary history, how life evolved there,” Calvin says. “That’s one of the reasons I’ve been trying to find more than one species of stag beetle in Singapore.”

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I use dung beetles as indicators of the forest – the dung beetle, which she calls "nature’s clean-up crew". "Macaques in some areas are used to feeding on wood in the forest canopy. Like Calvin, PhD student Ong Xin Rui sets traps in and off the ground. However, her quarry is the dung beetle, which she never mind how good or bad they smell. Despite these challenges, studying dung beetles is no monkey business for Xin Rui. "Dung beetles provide key services in nutrient cycling and secondary seed dispersal. Hopefully, they can be recognised as a group that’s really important for forest ecosystems," she says.

"Macaques in some areas are used to being fed, so they will come up to you to look for food. Once, in Pulau Ubin, I was retrieving my pitfall traps and left a plastic bag filled with traps and dung on the ground. A macaque thought it had food and rushed over and grabbed the bag. But obviously it wasn’t food, so it got angry and started throwing everything around," she recounts.

"If you are not a scientist, you may think animals are pets. They are worth more than decoration," she says. "Dung beetles get excrement from different kinds of animals as a source of food and for nesting purposes. So I collect them, bring them back to the lab and sequence the DNA of their gut contents to find out what animals can be found in the same forest."
Wish you could have luminous K-glass skin like Jisoo or IU? Now you can take a stab at rocking that radiant, super-hydrated look even in sweltering Singapore.

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For a limited time only, HEY! readers can enjoy this treatment at an exclusive price of $88 per session (U.P. $380).

Visit chrysalis.com.sg to start your journey toward beautiful, healthy skin.