

# HEY!

AN AUGMENTED REALITY MAGAZINE

**INSIDE**  
▶ Birthday wishes and moments that matter  
▶ HEY! cover talents: Where are they now?  
▶ 30 reasons why we're proud of NTU



**HEY!**  
*AR*  
SCAN THE FRONT AND BACK COVER for some delicious HEY! moments and a birthday treat!

THE  
ANNIVERSARY ISSUE  
HEY! TURNS 10 AS NTU TURNS 30



**HEY!**  
*AR*  
SCAN THIS PAGE  
for a chance to get your face pampered as well – through Chrysalis' DermoElectroPoration (DEP) skin booster treatment worth \$428.  
Terms and conditions apply.

# CAREFREE DAYS AHEAD

## Hang loose in tough times

We all want hair in all the right places. But sometimes, it feels as though we spend too much time removing it in unwanted places. If you haven't heard of IPL, or Intense Pulsed Light, the beauty of it is in the hours you'll save reducing and even removing the unwanted.

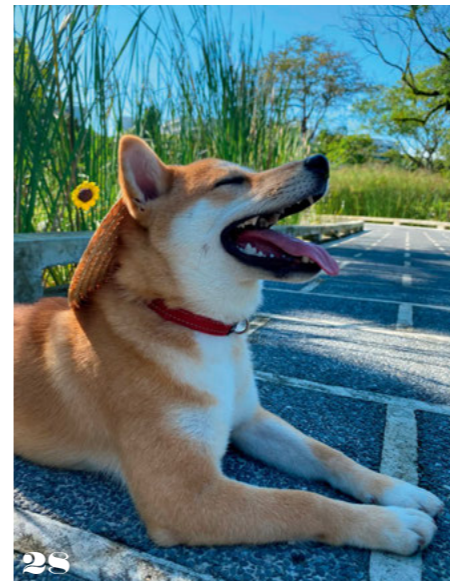
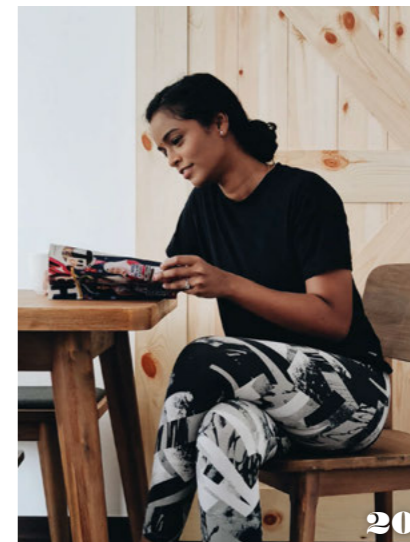
Performed under the care of trained technicians, IPL is a safe and effective way to permanently remove hair. It uses light to

heat hair follicles and prevent regrowth. The heat destroys the hair follicles after a number of sessions depending on how much hair you have.

For a limited time only, you can purchase six sessions of IPL Underarm Hair Removal for \$38 at Chrysalis Spa. Try it out and you may just be a convert.

Hair today, gone tomorrow.

Visit [chrysalis.com.sg](http://chrysalis.com.sg) for more information or drop by one of our branches at **AMK Hub (#03-26), Pacific Plaza (#03-13) or Jurong Point (#03-04) to find out how you can enjoy this offer. Terms and conditions apply.**



- 2 THE NTU HEY! AR GUIDE**
- 5 MOMENTS THAT MATTER THROUGH TIME**
- 4 30 BIRTHDAY WISHES ON NTU'S 30TH**
- 8 30 INCREDIBLY UNIQUE REASONS WHY WE'RE PROUD OF NTU**
- 15 LET YOUR DREAMS TECH FLIGHT**
- 16 10 THINGS YOU DIDN'T KNOW ABOUT HEY!**
- 18 FYI – IN AND AROUND NTU**
- 20 HEY!, NICE TO SEE YOU AGAIN**
- 28 CAMPUS, SWEET CAMPUS**
- 30 THE FUTURE IS 3D PRINTED**
- 32 TOMORROWLAND**
- 34 GREAT MINDS THINK UNALIKE**
- 36 A NOD FOR THESE MODS**



NTU HEY! AR  
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# THE NTU HEY! AR GUIDE

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

**HEY! AR**  
SCAN THIS PAGE to watch how to maximise your AR experience

HEY! AR Available on App Store & Google Play



## WATCH PICTURES COME TO LIFE

See the page morph into a video

Tap here to pause or continue the video

You can also pull your phone away from the magazine to watch the video

## TAKE PART IN COMPETITIONS AND GIVEAWAYS

Tap here to submit a contest entry



## PLACE 3D OBJECTS IN YOUR ENVIRONMENT

Put a new spin on things



Drag your finger near the object to swivel it

Tap here to reset the object's starting position

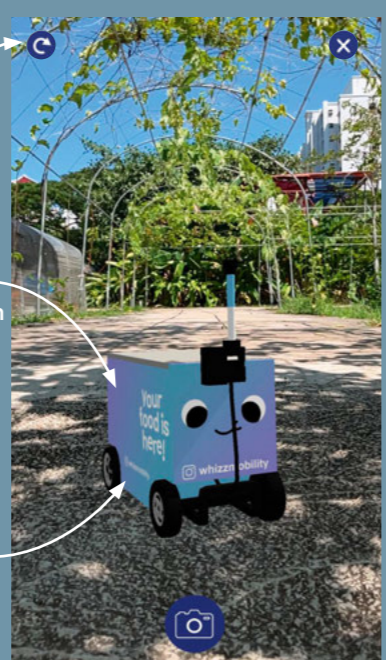
Tap here to anchor the object to the ground

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

Tap here for a selfie view with the object

Touch the object and drag it to move it around

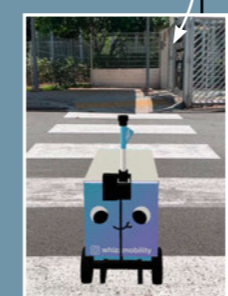
Tap here to take a screenshot



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



Get creative!



# MOMENTS THAT MATTER

*through time!*

HEY! INSIDER

Derek Rodriguez Ei Ei Thei

SCAN THIS PHOTO



SCAN THIS PHOTO to watch Minister for Education Mr Chan Chun Sing's video letter in full

Minister for Education Mr Chan Chun Sing imagined the NTU education of the future in his video letter to the Class of 2041, which was the first item deposited in the time capsule.

NTU's 30th anniversary celebrations kick off with the launch of a digital time capsule, an inspirational collection of past and present memories

Standing among the upper echelons of universities around the world, it's sometimes hard to believe that NTU only turns 30 this year, having been inaugurated in 1991. The last three decades have been punctuated by groundbreaking innovations in its 200-hectare smart campus, now a testbed for urban technologies of the future and a vibrant hub of learning.

Such is its trajectory that the next few decades are sure to be just as exciting. One highlight of NTU's 30th anniversary celebrations is a digital time capsule to be sealed this year and opened 20 years later

on the University's Golden Jubilee. From contributions of moments that matter from the NTU community, 30 unique souvenirs of past and present will be preserved in this memory bank to serve as inspirational stories to future generations of NTU students.

Look out for other 30th anniversary celebration events in the months ahead, such as an interactive exhibition and the launch of a book featuring the perspectives of 30 individuals who have been involved in NTU's journey.

Thanks, OneNTU, for a momentous 30th!

**HEY! AR**  
SCAN THIS PHOTO to relive the launch of the digital time capsule



HEY! PEOPLE

Chrystal Chan + Vivian Lim

**1** Grace Chua  
Medicine, national badminton athlete



"To have a sports scholarship programme that lets outstanding athletes chase their dreams beyond Singapore while receiving a world-class education here."

**3** Cheah Guan Ying  
Social Sciences, 30th NTUSU President



"To have an annual event like the Nanyang Awards that's just for students to showcase the inspiring achievements of our peers in leadership, community service and entrepreneurship."

**13** Thiara Sana Ahmed  
Chemical & Biomedical Engineering



"That there will be continued support and advocacy for women in science and engineering to grow the love for innovation and technology that's in our DNA."

**14** Lim Kai Peng  
Biological Sciences



"For the photography community to blossom with student shutterbugs getting a head-start when they photograph big events in NTU."

**"FOR A THRIVING START-UP CULTURE TO BE INFUSED INTO ACADEMIC LIFE, WHERE STUDENTS CAN CLEAR MODULES BY RUNNING A SUCCESSFUL START-UP."**

**5** Melvin Foo  
Renaissance Engineering Programme, co-creator of FoodBot

**6** Charlie Tan  
Humanities



"That the core curriculum will continue to encourage creative thinking and include modules in technical analysis and business investment strategies, so that student entrepreneurs can innovate and create sustainable wealth at the same time."

**"THAT THERE WILL BE A DIVERSE RANGE OF PHILOSOPHY MODULES FOR STUDENTS TO EXPLORE, SUCH AS PHILOSOPHY OF LAW OR EVEN AFRICAN PHILOSOPHY!"**

**12** Racher Du  
Humanities

HEY!

AR

SCAN THIS VISUAL to download the Lyon sticker pack for Telegram

# 30 BIRTHDAY WISHES on NTU'S 30TH

Three decades of sparking ideas and creating impact – NTU has much to celebrate on its 30th anniversary. What are students' hopes and dreams for the future of NTU? We asked 30 students and this is what they said

*My birthday wish for NTU is...*

**"TO SEE CASE CULTURE BECOMING BIGGER WITH INTENSIVE BOOT CAMPS FOR ALL WHO WANT TO JOIN AND ACE BUSINESS CASE STUDY COMPETITIONS."**

**2** Cleo Sim  
Accountancy & Business



**4** Andrea Jane Rojas  
Humanities, NTU Jazz & Blues Chairperson

"That the various music clubs in NTU collaborate across different musical genres and foster stronger bonds through teamwork and showmanship, showing the rest of Singapore the amazing music we can produce together."

**7** Alvin Wong  
Physical & Mathematical Sciences



"For students to undergo a curriculum that not only develops them holistically but strengthens their character."

**"FOR OUR MUSICIANS TO BE ABLE TO PRACTISE IN A LARGE, PURPOSE-BUILT ORCHESTRAL REHEARSAL SPACE ON CAMPUS."**

**8** Ng Ze Wei  
Renaissance Engineering Programme, NTU Symphony Orchestra Music Director

**"THAT WE WILL BE KNOWN FOR BEING ONE OF THE TOP UNIVERSITIES IN FLOORBALL."**

Lim Jian Hong **9**  
Sport Science & Management, national floorball athlete



**10** Yee Soo Xien  
Art, Design & Media, RE•MIX 2k21: Fashion Design Competition winner

"To have a rotating roster of interactive spaces across the campus and more modules fusing art and tech. NTU designers will be behind many incredibly well-designed lifestyles."

**11** Gerald Tan  
Communication



"To further fortify the hall culture. Since we create bonds through numerous late-night suppers and gatherings, a key ingredient would be keeping more F&B stalls on campus open till late."

HEY! PEOPLE

Chrystal Chan + Vivian Lim



15 Rochana Tiyyagura  
Computer Science & Engineering

"That there will be more events organised to inspire more girls to pursue a career in the typically male-dominated tech field"

"FOR MENTAL WELLNESS TO BE THE NORM WITH STUDENTS COMING TOGETHER FREELY TO SHARE HOW THEY COPE WITH LIFE'S PROBLEMS, SUCH AS BY EXPRESSING THEIR FEELINGS THROUGH ART."

Gillian Peck 22  
Biological Sciences, founder of ARTnotes from the Heart



21 Muhammad Mukarram  
Humanities, NTU Muslim Society President

"That we continue to be inclusive and welcoming to people of different faiths and be strengthened as a community through tolerance, understanding and empathy."

"THAT AS A UNIVERSITY WE ADVOCATE FOR INCLUSIVITY OF STUDENTS AND STAFF WITH DISABILITIES BY INTEGRATING THEM INTO A COMMUNITY WHERE EVERYONE PRACTISES KINDNESS."

23 Foo Xu Hui  
Biological Sciences, competitive para-swimmer



30 Pravenisa Viswambharan  
Physical & Mathematical Sciences, NTU Tamil Literary Society Chief Editor

"For more funding for student clubs and societies to help finance community service efforts, and to provide NTU students with better welfare packs and student activities."

"FOR MORE NTU ATHLETES TO GAIN EXPOSURE AT INTERNATIONAL SPORTING EVENTS. EVEN IF THEY DON'T WIN, THE EXPERIENCE WILL GIVE THEM THE EDGE AT THEIR NEXT BIG COMPETITION."

Regan Tan 29  
Renaissance Engineering Programme

"THAT THERE WILL BE MYRIAD WAYS FOR STUDENTS TO COME TOGETHER TO GENERATE IDEAS, HOWEVER BIG OR SMALL THEY MAY BE, AND INFLUENCE THE WORLD IN THEIR OWN AREAS OF EXPERTISE."

28 Park Ji Won  
Biological Sciences, co-founder of Hey, You Got Mail!



24 Pothunuri Laya  
Mechanical & Aerospace Engineering, National Geographic Young Explorer 2020

"That as a research university, we will be a sustainability champion educating on the importance everyone plays in mitigating climate change. This will be an essential core module for all first-year students."



20 Alexis Goh  
Environmental Science, co-director of Earthlink NTU Nature Guiding AY20/21 team

"For a biodiversity-friendly campus that strives towards peaceful human-wildlife coexistence, where people live in harmony with nature and help wildlife in need."

"THAT WE CAN BRING STUDENT INNOVATION TO THE NEXT LEVEL WITH MENTORSHIP THAT'S AVAILABLE TO WHOEVER THAT NEEDS IT."

Lee Wen De 17  
Art, Design & Media

HEY!

AR

SCAN THIS VISUAL to celebrate NTU's birthday with Lyon stickers on WhatsApp

"THAT THE CHINESE MAJOR IN NTU WILL GAIN PROMINENCE AND BECOME SO WELL KNOWN INTERNATIONALLY THAT PEOPLE WILL STOP SAYING: 'THERE'S SUCH A MAJOR IN NTU?'"

19 Angelyn Chew  
Humanities

18 Low Zi Hao,  
Art, Design & Media

"That we make art even more accessible on campus through kinetic sculptures that incorporate touch or proximity sensors and interactive features. A bonus would be if all the works are by NTU students."



25 Alvin Chew  
Medicine graduate student

"To have our own biopharmaceutical production facility on campus to accelerate vaccine and drug trials! I believe this internal capability will boost NTU's biological research impact and be a boon to society."

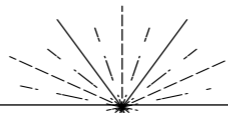
"TO HAVE AN ELITE COLLEGIATE ESPORTS TEAM CAPABLE OF COMPETING ON A GLOBAL LEVEL, AND WORLD-CLASS ESPORTS FACILITIES AT THE READY FOR SINGAPORE'S E-ATHLETES."

Ariana Yeo 27  
Business, NTU Esports Society Vice President

26 Liew You Sheng  
Computer Science & Engineering, SandboxSG Founder

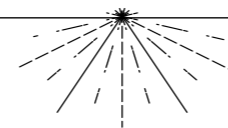
"For hackathons to be a way of life, helping students adapt to industry standards, and for an NTU module dedicated to hackathon skills, such as rapid software prototyping, to prepare students for such competitions."





# 1 COMPARED TO OUR PEERS RANKED AMONG THE WORLD'S TOP 20 UNIVERSITIES, WE'RE REALLY YOUNG

The average age of the top 20 universities in the QS World University Rankings is 265 years. And NTU? We're 30 this year. No, we didn't forget to add a zero.



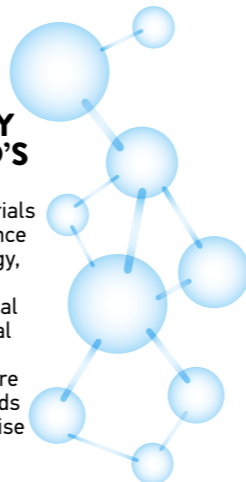
# 2 ... WITH ONE OF THE WORLD'S BEST DATA SCIENCE AND AI UNDERGRADUATE PROGRAMMES

Artificial Intelligence and data science are synonymous with the hot jobs of tomorrow and NTU is the place to kickstart a budding career in this sector. According to Forbes, we offer one of the top 10 such undergraduate programmes in the world.



# 3 ... AND FOUR SUBJECTS ABSOLUTELY THE WORLD'S BEST

We're tops in Materials Science, Nanoscience and Nanotechnology, Condensed Matter Physics and Physical Science, say several global ranking indicators. These are also expanding fields that will revolutionise many industries.



# 4 WE GIVE YOU FOOD FOR THOUGHT...

With 14 food courts housing 114 stalls, and 31 other F&B outlets on campus, you'll have a hard time picking your lunch. The next eatery popping up is a café at Yunnan Garden – keep your eyes and ears peeled!



# 8 ... SO STUDENTS CAN BE WELL-VERSED IN ALL THE IMPORTANT THINGS

Make friends from other disciplines as you work in teams to master digital literacy, communication and inquiry, ethics and global issues, under the new common interdisciplinary curriculum. A wide spectrum of double major and double degree combinations, and one-of-a-kind courses such as the Renaissance Engineering Programme offer bright, ambitious young students fast tracks into that niche role they've been dreaming of.

# 9 EVEN OUR HALLS OFFER THE PERKS OF MODERN RESIDENTIAL LEARNING

Learning in class is so mainstream. So we extended it to all corners of the campus. From picking up astrophotography on the rooftops of your hall and gardening to cooking in specialised kitchens and even dabbling in graffiti art, you'll find skills to fall in love with right in your own backyard.



# 5 ... AND WE EVEN GET OUR LUNCH AND DINNER FROM CUTE ROBOTS

Created by NTU students, the FoodBot is Singapore's first outdoor delivery robot. These dependable little blue bots have completed over 12,000 deliveries on campus, rain or shine.



# 6 WE'LL BE THE ONLY SINGAPORE CAMPUS WITH 3 MRT STATIONS

All aboard the rail-volution! Set to be ready by 2029, these MRT stations will make it even more convenient for the 40,000 people who live, work, study and play in NTU to travel in and out of the campus. Cheers to the power of three!



# 10 OUR DOCTORS-IN-TRAINING ARE RIGHT AT THE HEART OF HEALTHCITY NOVENA

Connected directly to Tan Tock Seng Hospital, the NTU medical school's Clinical Sciences Building is in the main artery of healthcare. But the school building itself is also outfitted with realistic hospital settings, and better yet, lets doctors-to-be take chill pills between lessons in student lounges that inspire creativity and in a library that boasts spectacular views of the Singapore skyline.



# 30 INCREDIBLY UNIQUE REASONS WHY WE'RE PROUD of NTU

Oh NTU, how I love thee? Let me count the ways



HEY!

AR

SCAN THIS PHOTO to see Nadine hard at work



### 11 WE'VE ENGINEERED ROBOTS THAT ARE ALMOST HUMAN

They even have jobs! Nadine the social robot has had gigs as a receptionist, at a financial firm and at the ArtScience Museum, where she admittedly stole the limelight from some exhibits. EDGAR made a name for himself too, as the first robot host in Singapore's 2017 National Day Parade.

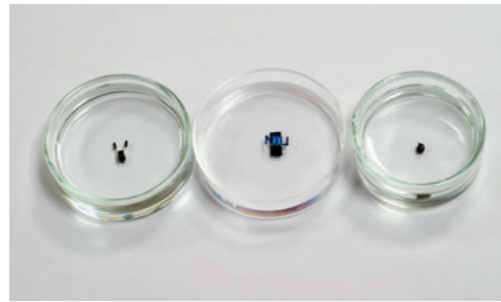


### 12 SOME OF THESE BOTS STAND IN FOR US DOING TRICKY WORK

They have even taken on the hardest task known to man – assembling furniture from IKEA. NTU-made robots have also found swift success in the construction industry, where they have performed in roles such as painters and quality inspectors.

### 13 ON TOP OF THAT, THEY FIX US TOO

Inventions like the EndoMaster and rice-sized robots (right) allow surgeons to perform surgeries without incisions and help deliver drugs to parts of our bodies. There's even an orally ingested self-inflating weight management capsule that could be used to treat obesity.



### 14 THE WHO'S WHO OF INDUSTRY ARE HERE

NTU has the most number of corporate and joint labs in a Singapore university, with Rolls-Royce, Alibaba, Saab, HP and L'Oréal among those who have set up labs with us. Courses co-designed with companies like Google, AMD and DBS also give students an edge in employability. And have you visited Dyson's studio in NTU, a cool makerspace for those interested in product development?

### 15 OUR INNOVATIONS IN SINGAPORE'S COVID-19 ARSENAL REGULARLY MAKE THE NEWS

We're at the front lines of the fight against COVID-19. Made-in-NTU innovations include a semi-autonomous disinfection robot, a wastewater surveillance system, a breathalyser that takes just two minutes to detect positive cases, and a nanotech mask that kills 99.9% of bacteria and viruses. NTU is also helping the nation process COVID-19 test results more quickly through big data and using a robotic arm to transfer samples accurately for lab testing.



HEY!

AR

SCAN THIS VISUAL to take control of a disinfection robot

### 16 DESPITE THE PANDEMIC, 9 IN 10 NTU GRADS RECEIVED A JOB OFFER WITHIN 4 MONTHS OF GRADUATION

According to a graduate employment survey, 2020 graduates also earned more than those from previous cohorts, with grads from Business & Computing, Medicine and Accountancy and Business among the highest paid.



### 17 WE DONATED OUR LEAVE AND RAISED \$10 MILLION FOR NTU STUDENTS

When breadwinners lost jobs during the pandemic and NTU students were affected, we stepped in. More than 1,800 NTU faculty and staff donated 20,145 days of unused vacation leave last year, raising more than \$10 million to help these families. NTU President Prof Subra Suresh and his wife, Mary, also gifted \$100,000 to kickstart the NTU Priorities Fund, which rendered aid to students affected by COVID-19.

### 18 AND EVEN IN A DOWNTURN, THE CLASS OF 2021 RAISED THE LARGEST CLASS GIFT IN FIVE YEARS

They raised over \$124,000, which will be used to relieve the financial burden of needy students.

### 19 IT'S OFFICIAL, WE'RE BEAUTIFUL

We've made the "most beautiful" lists of American Express' Travel + Leisure magazine and Business Insider, joined Fodor's Travel's list of Fantastic Modern Architecture to Blow Your Mind, and been described by Times Higher Education as "a haven for modern design addicts". And not forgetting our listing in QS' 10 of the Most Photogenic Universities in the World, which pointed out that we have "more than just good looks". Brains and brawn for the win!



### 20 AND NO DOUBT ABOUT IT, WE'RE HOME TO SOME OF SINGAPORE'S MOST PHOTOGRAPHED LANDMARKS

With eye-catchers like The Hive, the School of Art, Design & Media building and the waterfall at the historical Yunnan Garden, the campus is a playground for wedding and architecture photographers, as well as influencers seeking the perfect backdrop for their next post. It's also why alumni keep coming back.



PHOTO: SHOOTSPROUTS MEDIA

### 21 DID WE MENTION THE NATIONAL MONUMENTS ON CAMPUS?

We value our rich heritage as a university sited on lush grounds that once housed Singapore's first Chinese-medium university outside China. See if you can spot national monuments such as the Nanyang University Memorial and the old Nanyang University Library and Administration Building (now the Cultural Heritage Centre). There is also a replica of the Nanyang University Arch in Yunnan Garden. Bonus points if you hunt down the original arch, which was also declared a national monument.



### 22 WE'RE TODAY A LIVING LAB OF SUSTAINABILITY...

Hop onto the future of smart transportation with autonomous electric buses that are being tested on campus roads and at NTU's driverless vehicle test centre, Singapore's first, complete with mock skyscrapers and simulated rain. We also lead research on Singapore's smart grid and work with big industry to showcase how to cut energy use and develop smart and safe city solutions. Everything we discard as trash on campus is collected and treated at our own plant and converted to electricity and construction materials.



HEY!

AR

SCAN THIS VISUAL to take a ride on the world's first full-size driverless electric bus

### 24 WE MAKE WOOD WOW

NTU's cavernous sports complex, The Wave, will stop you in your tracks. But beneath its striking surface is an equally impressive array of technologies that keeps energy consumption low. Hot on its heels is the upcoming six-storey, 40,000 square metre home for the business school that's ready to take its place on the podium as the largest wooden building in the region. What's more, trees felled to make way for NTU's new buildings have been turned into usable pieces of furniture and art displayed around our two campuses. Don't be surprised to find yourself sitting on a chair that's made from a campus tree!



### 23 ... WITH THE MOST NUMBER OF GREEN MARK PLATINUM-CERTIFIED BUILDINGS ON A CAMPUS

We walk the green talk through achieving greater environmental sustainability too with all NTU complexes Green Mark Platinum-certified. In fact, as early as 2016, we picked up the inaugural Green Mark Platinum Star Champion award, the highest accolade given out by the government for sustainable design.



### 25 WE TURN SCIENCE FICTION INTO REALITY...

Batman might soon need to visit NTU if he needs a replacement cape, like one made from 3D-printed fabric invented by scientists here that stiffens on demand (see also page 28). He could use other made-in-NTU upgrades too, such as invisible cloaks and sweat-powered batteries.



### 28 OUR STUDENTS BUILT SINGAPORE'S FIRST 3D-PRINTED CAR

All 150 parts of the Nanyang Venture 8's body were made entirely in NTU by 3D printing, taking four months to assemble in 2015. The solar-powered race car is no slouch either, reaching a top speed of around 60km/h.

### ... AND TRASH INTO TREASURE

Unwanted bits of fruits don't always go into the bin. They often find a second life in our labs, with durian husks turned into bandages, fruit peels into batteries and discarded fruits into energy sources, among others.

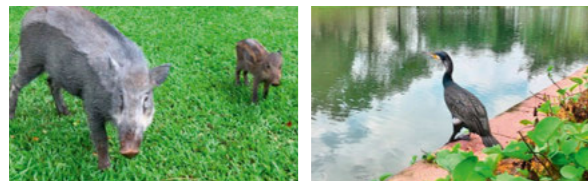


### 26 WE GO ALL OUT TO PROTECT SINGAPORE FROM CLIMATE CHANGE

Our researchers regularly clinch large research grants to tackle global issues like natural disasters, the ecology of oceans and forests, food security and climate change. Recently, they've extended the records of Singapore's sea-level history to almost 10,000 years ago, a vital step in helping Singapore's coastal defence plan against rising sea levels.

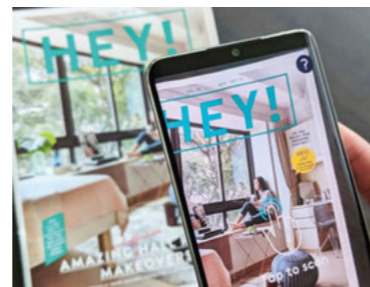
### 27 WE'VE GOT NPARKS CRED AS A HAVEN FOR WILDLIFE

Who needs Animal Planet when our 200-hectare campus is a lush home to numerous species of wildlife. Because of our unique location, we've seen pangolins, wild boars, macaques, birds of all flocks and frocks, and even a skirmish between a king cobra and a python. "Caution! Animal Crossing" signs on our roads are there for a reason - to ensure the safety of this treasure trove.



### 29 WE'VE MADE READING A THREE-DIMENSIONAL EXPERIENCE

We breathed new life into the world of print with the HEY! AR app. By harnessing augmented reality technology, 3D objects leap from pages into the real world and still images turn into videos. Try it, the power is in your hands!



### 30 WE HAVE AN ADORABLE MASCOT THAT YOU'LL WANT TO GET YOUR HANDS ON

First conceived by an NTU student in 2013, our beloved mascot Lyon makes his mark on NTU's 30th anniversary celebrations with a cuddly new look. Awwwww...



**HEY! AR**  
SCAN THIS VISUAL for a chance to win this coveted limited-edition NTU 30th anniversary tee!



# LET YOUR DREAMS TECH FLIGHT

Hoping to grow his business, newly-minted entrepreneur and Renaissance Engineering Programme student Gabriel Sze taps the brains of Dr Shi Xu, founder of NTU spin-off Nanofilm Technologies, which last year became the first local tech unicorn to successfully list on the Singapore Exchange



Dr Shi Xu

**HEY! AR**  
SCAN THIS VISUAL to get into the mind of a tech tycoon



3:45  
Hi Dr Shi, congrats on being named the Chairman of NTUitive! I am looking forward to all the ways we can learn from you 😊  
2:21 PM ✓

Today  
Thank you, Gabriel. Happy to be part of the NTU community again with a mission to get people excited about entrepreneurship and actually start companies! I've heard that you are an entrepreneur yourself. Tell me more about what you're working on  
2:25 PM

Yes definitely! I started this website called Dive Deals, which consolidates promotions, sales and great Singapore-based deals so people won't have to scour the Internet for them. It is purely web-based as most people are tired of downloading apps these days  
2:27 PM ✓

That's a good idea. App fatigue is real. Did you do everything yourself?  
2:29 PM

Most of it! I learnt the early fundamentals of coding during my first year in NTU under Prof Ong Yew Soon and after taking part in many hackathons and software competitions, I had enough confidence to build a website from scratch. I also applied my knowledge of algorithms and Artificial Intelligence to search for deals instead of doing it manually  
2:31 PM ✓



Here's a hackathon I joined in 2019 where I went to Chennai, India! That was the last hackathon before the pandemic hit haha

2:31 PM ✓



2:31 PM ✓

Well done. All the best for your start-up! 🍀

2:32 PM

Thanks Dr Shi! What are your thoughts about students working in a start-up? Do you have any advice for us?

2:34 PM ✓

You already have the first, which is passion. Determination too. Don't just dream, go out and do something. It's okay to fail, especially since you are young. You must be able to execute your plan. Start by thinking about what you are going to do tomorrow and the day after. Don't think about things that are very far away. Plan it step-by-step in a practical manner

2:40 PM

Got it! If you could go back in time, what advice would you give yourself?

2:40 PM ✓

Be sure to know the business side of things! Learn finance, accounting or about the corporate world. It is especially important for businesses in science or technology like yours, or else you will be at other people's mercy if you want to grow your start-up

2:46 PM

I agree. 🍀 It's good that I'm in the Renaissance Engineering Programme, which bridges engineering and business. 😊 I get to take courses in accounting, management and marketing, and also graduate with a Master's in Technology Management

2:47 PM ✓

I wish we had that course when I was a uni student!

2:48 PM

You can actually teach it now as Nanyang Professor of the Practice 😊 We would love to have you as guest lecturer! Here are my course mates. We work and play hard. It's a 4.5 year programme and as a small cohort we form strong bonds and feed off each other's creative energy.

2:50 PM ✓



2:53 PM ✓

You'll be well-equipped to grow your business then! How has your time in NTU been like?

2:55 PM

Oh it has been great! I've enjoyed working on crazy ideas with my classmates. We have taken part in many competitions together and would stay up late to bring our ideas to fruition. Not all of our ideas may work fully but the fun and the adrenaline rush can't be beat 😊😊 What were some of your most memorable experiences at NTU?

3:02 PM ✓



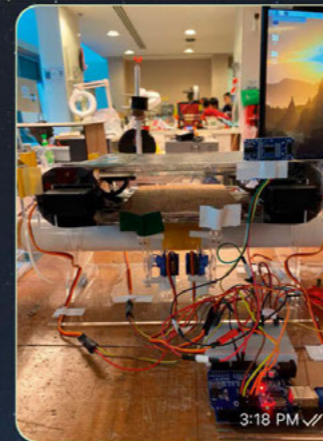
3:05 PM ✓

The day I was allowed to have my own research lab as a young professor. It is such a wonderful thing to have a dedicated space where you can do experiments and have student researchers who share the same vision to come in to help. It was very exciting for me. I hear that students now get a lab space to work on their projects?

3:14 PM

Yes! There are a few lab spaces for different types of projects. I've used the Makers' Lab to work on developing software with my classmates. Here's a photo of one of our projects done in the Renaissance Design module.

3:18 PM ✓



3:18 PM ✓

What was the greatest challenge in running your start-up?

3:19 PM ✓

There were many. One of the chief issues we faced was whether our technology was mature enough. I kept asking myself: Can I really deliver? This is fundamental for a start-up, being able to deliver what you promise

3:22 PM

That's true. A big challenge for me as the core developer is coming up with all the tech I need. It is a huge responsibility to make sure the platform functions well, that features are implemented properly, and that the system is optimised

3:23 PM ✓

Yes, exactly. Many young people have brilliant ideas for start-ups but not all of them think about whether they are able to deliver on their unique value proposition. This goes back to what I said earlier, about knowing what to do tomorrow. You must plan it out well to succeed

3:29 PM

Your company, Nanofilm Technologies, is such a success. To think it started as lab work in NTU's electrical and electronic engineering school! It was publicly listed last year and is now a multi-billion dollar multinational company. Did you envision all this?

3:31 PM ✓

I had a dream, but it wasn't in such detail. I just knew that I wanted the company to grow and be publicly listed some day. If you trace the journey of Nanofilm from its inception until now, you'll see that it took us 20 years. I used to say that I will retire in 10 years. That means it is almost two retirements that I didn't get!

3:34 PM

🤔 No regrets though, right? 3:37 PM ✓

Yes, no regrets. I'm someone who likes innovating and Nanofilm is now positioned to do more deep tech, which is my passion. We have the freedom to explore and to create new products or expand into other areas. So it seems that I'll need to postpone my retirement for another 10 years 😊

3:40 PM

Thank you, Dr Shi, for speaking to me so candidly and sharing your experience. 🙏 I look forward to meeting you on campus now that you're spearheading NTU's enterprise plans

3:41 PM ✓

Chairing NTU's innovation and enterprise company is my way of giving back to the university that helped me build my dreams in the first place 😊

3:42 PM

Message

HEY!

AR

SCAN THIS VISUAL for a chance to win this book and be inspired by the life of another famous inventor, Sir James Dyson





### 4. TWO MAKEOVERS TO MOVE WITH THE TIMES

We've updated our look to keep up with the times, while bringing you the skinny on NTU from new and surprising angles. The one thing that hasn't changed is our word to being bright and breezy as we share cool facts and tips.



### 5. 34 AWARDS ALONG THE WAY

These include accolades from the US, UK and Asia, most recently for our innovative use of augmented reality in creative storytelling. HEY! cheered with readers when it picked up the prestigious Best of the Best prize at the 2020 Gold Quill Awards. Said one judge: "The engaging visual style is fresh and fun, bright and bold, and seems on brand for a smart university." Another praised NTU's "choice of colours, layout, styles and the outstanding use of imagery and 3D animation, alongside the selective and effective use of AR". The team behind HEY! also took the global In-house Digital Team of the Year title at the inaugural awards organised by the International Communications Consultancy Organisation in the UK.

## 10 THINGS YOU DIDN'T KNOW ABOUT HEY!



To celebrate HEY!'s 10th anniversary, we roll back the years and pull back the curtains on this award-winning magazine in your hands. AR you ready?

HEY! AR

SCAN THIS VISUAL to watch the roaring debut of HEY! AR



### 2. YOU CAN TAKE SELFIES WITH HEY!'S 3D AR CREATIONS

Strike a pose with the AR objects from HEY!. Better yet, rope your friends in for an epic selfie. Over the last two years, arctic animals, famous buildings, life-size NTU inventions and other quirky 3D elements have been brought to life. Watch out world, there's more in store!



### 1. HEY! IS THE FIRST AR UNIVERSITY MAGAZINE

Print is as dead as dinosaurs? These claims were sent back to the Jurassic age when a Tyrannosaurus emerged from the pages of HEY! to a packed auditorium of freshmen in 2019 using an augmented reality (AR) app. At its launch, HEY! AR trended number one on both Google Play and the App Store under the education category. Web AR has now arrived at the HEY! website too, which means you can load 3D objects on your phone while reading the mobile version.

### 3. THE LEAP INTO AR ISN'T THE FIRST TIME WE'VE SHAKEN THINGS UP

Rolling with the times, HEY! has evolved technologically. In its early days, HEY! had an iPad app for reading on the go. Then came HEY!Shake, an app developed by an NTU start-up that was used together with HEY! TV screens around campus. Readers who spotted HEY!Shake icons on the screens could shake it (their phones, we mean) to win prizes or take part in mini surveys.

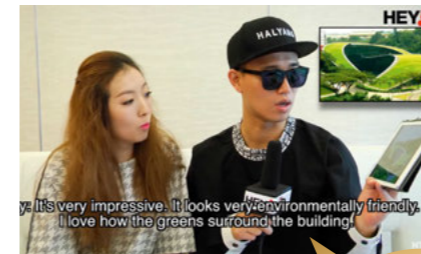


### 6. WHAT'S IN THE NAME?

HEY! is all about sharing the unexpected. To offer an insider view of things and make you take a second look, or go: "Hey, I didn't know that!" Now you know.

### 8. HEY! HAS GONE BTS (BEHIND THE SCENES)

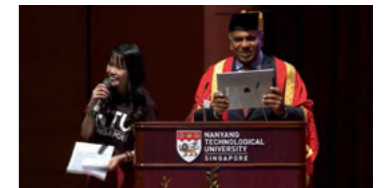
To meet celebrity alumni like Stefanie Sun and Joanne Peh, and visiting K-pop idols like Kang Gary and Dal Shabet. Our writers have also gone behind hoardings to give you sneak peeks of everything from the making of NTU's shopping and food street to designer enclave The Hive before they were revealed to the public.



It's very impressive. It looks very environmentally friendly. I love how the greens surround the building!

### 7. THESE PHOTOS WERE TAKEN WITH PHONES!

Unlike professional cameras and lenses, our sense of adventure and curiosity are never kept in the cupboard. HEY! is always ready to capture key moments – with smartphones. Encapsulating this spirit, the photos in HEY! have been taken with mobile phones since the magazine's latest revamp in 2019. This includes cover photos!



"HEY! has earned global recognition as a magazine that creatively harnesses smart technologies to enhance the reading experience. When I launched the revamped HEY! in 2019, I was impressed by how it uses augmented reality to make stories about campus life, students, professors and alumni come alive. It reinforces the NTU Smart Campus branding and has raised the bar in creative communication by universities. Happy 10th anniversary, HEY!"

– NTU President Prof Subra Suresh

### 10. IT'S ALL IN A DAY'S WORK SHOWING YOU A DIFFERENT SIDE OF YOUR PROFS

You may see your profs as wise sages in the lab and classrooms, but there's more to them than meets the eye. To catch them in their natural habitat, HEY! has dived into shark-invested waters, cut some ice and gotten into skirmishes – just to help you see what else your profs are capable of.



### 9. STUDENTS' SUCCESS STORIES INSPIRE US

Sharing stories of students' achievements not just in print but with videos and AR has been a source of joy. Over the years, HEY! has covered innovations, inventions and pursuits that have taken the campus and country by storm, and applauded many more record-breaking and inspiring feats.

HEY! AR

SCAN THIS VISUAL to see what former Running Man star Kang Gary thinks of NTU

"Digital devices are carried by almost everyone, and today's smartphones already come with augmented reality. Fast and reliable data networks are everywhere, attention spans are short, and the young expect news to be informative and yet entertaining... it's especially satisfying to have combined the digital and the physical realms to create a new product that offers new spatial and sensory experiences for our digitally-savvy audience."

– Dr Vivien Chiong, NTU's Chief Communication Officer, who conceptualised HEY! and spearheaded its transformation into an augmented reality magazine two years ago

# FYI!

## SCENE



## HEARD



"It is our belief that the university's actions must match its words, and our efforts aimed at sustainability begin on campus. In other words, NTU walks the walk.... Sustainability encompasses a wide range of things, including the actions of our employees and students, and the university's endeavours in education, research, technological innovation, artistic creativity and service to society."

– NTU President Prof Subra Suresh on NTU's resolution to lead by example in its new Sustainability Manifesto. The Manifesto includes plans to achieve carbon neutrality by 2035, and will be supported by a \$1 billion bond facility. NTU is the world's first university to issue a publicly-offered sustainability-linked bond.



**HEY!**  
*AR*  
SCAN THIS VISUAL for a chance to win Honest & Gentle's award-winning body lotion and deodorant products

### Shea love

The future looks pretty for NTU alumna Grace Lee, whose homebrewed vegan skincare products snagged two awards at Beauty Insider 2021. The communication grad built her brand, Honest & Gentle, from scratch after leaving her full-time job at the height of the pandemic last year. From branding to designing the website, and even blending the products by hand in a makeshift lab, she did it while making a difference in the lives of others.

Her company is a business with a mission that purchases unrefined shea butter handmade by women in Ghana who are paid proper wages. And part of proceeds from each product sold on the official store is donated to charities. "It's more of a passion project than a business," she says. "It's something I want to do, even though it may not make much money."

### ONE FOR THE MEMORY

An NTU engineering duo made Google headlines when they were crowned one of the three winners in this year's Google Solutions Challenge. The students' invention, an app that keeps dementia patients safe and engaged and gives their caregivers an avenue to get information and support for themselves, beat other entries from teams across six continents. As a sign of the app's utility, the pair is already working with social organisations and nursing homes in Singapore and are planning to reach out to private caregivers as well.



What defines us is how we react to challenges. On that front, NTU drew high praise, winning an award for its COVID-19 response from the International SOS Foundation. Judges noted how we went above and beyond for students with the NTU COVID-19 Relief Package and a novel staff leave donation scheme that provided timely aid to students most affected by the pandemic.



**HEY!**  
*AR*  
SCAN THIS VISUAL to watch how we overcame the pandemic

### HEAT VS CRIME

Even crime strikes when it's hot. Using crime and temperature data from Los Angeles, a research team with an NTU economist found that overall crime rates are slightly higher on days when the temperature exceeds 90°F (32.2°C), bringing new meaning to the importance of keeping it cool.

### GUILT-FREE GRUB

Snacks are on everyone's lips. The local snack market is expected to be worth more than \$230 million this year. And thankfully, more are reaching for healthy bites, says an NTU marketing professor. She adds that unique snacks are hard to come by in most grocery stores and she wouldn't be surprised to see curated snack subscriptions making their way into homes. Food in the mail – that's a delicious idea!



### Traits of a leader

Flexible, creative and tech savvy – does this describe you? These are the qualities needed in the business leader of tomorrow, says an NTU economist. With an uncertain business environment looming, a knack for recognising and taking advantage of opportunities is a powerful tool. The world of "e-everything" also calls for managers capable of navigating the digital realm.



### LITTLE WONDERS

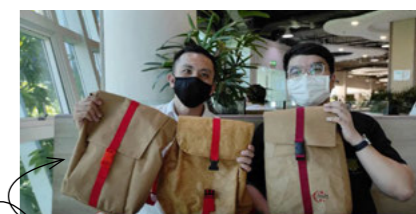
Don't make little of our forest critters. These tiny soil and leaf litter dwellers, from bugs to butterflies, punch above their weight in terms of the benefits they provide to the ecosystem. To bring awareness to them, ecology undergrad Tay Li Si set out to identify and quantify the local forest arthropod community and learn how reforestation affects them. His study, the first of its kind in Singapore, also scored him an invitation to present his research at an international conference.

### VENICE BIENNALE, HERE WE COME

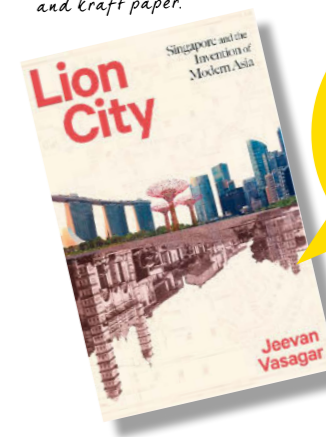
Two NTU artists will be headlining Singapore's first all-women team at next year's Venice Biennale, the world-famous exhibition often referred to as the Olympics of the art world. Give it up for Prof Ute Meta Bauer from the School of Art, Design & Media and former NTU Artist-in-Residence Shubigi Rao!

### THE MATERIAL MAN

Bagged this year's National Day Parade pack? Here's the scoop – an NTU student played a major part in its development. Materials science and engineering undergrad Tan Shi Zhou took on the role of materials consultant, studying the suitability of different materials and ultimately recommending DuPont Tyvek for its cost-effectiveness, recyclability, durability and water resistance. One for keeps!



Shi Zhou (right) with three prototypes of the NDP pack made from polyester, DuPont Tyvek and kraft paper.



**HEY!**  
*AR*  
SCAN THIS VISUAL for a chance to win this book about Singapore's rise as a global city and relive the NDP spirit

HEY! PEOPLE

Chrystal Chan Ei Ei Thei

HEY!,  
NICE TO  
SEE YOU  
AGAIN



HEY!

AR

SCAN THIS VISUAL  
to see what  
these HEY! cover  
talents look like  
today

HEY!'s 10th anniversary  
this year got us thumbing  
through old issues of the  
magazine, and we decided  
to hunt down some of  
these past students who  
not only uplifted us with  
their stories but made  
previous covers of HEY!.  
Where are they now?





## All you need is love

**Sangeetha Ragu**  
Class of 2016,  
Mechanical  
Engineering



On cover of:  
HEY! Issue 28

When Sangeetha graduated five years ago, it was with tears of joy. She had just spent two years fighting Hodgkin's Lymphoma, juggling her studies with chemotherapy. Losing her hair was upsetting at first, she recalls. "But with the love and support of my family, I got over that quickly and was just excited to rock a new pixie cut in future."

Not only did she beat second-stage cancer, she landed a plum role at Shell Singapore right after graduating as a member of the pioneer University Scholars Programme cohort. "Back then, I believed in working really hard and letting new opportunities find me. The plan still is to just be happy!" she says.

"My job as an inspection engineer was daunting fresh out of university, but over the years, I've thoroughly enjoyed the balance of hands-on and analytical work that I've been given," she says.

"I also realised that all my NTU experiences, such as hall life and being part of clubs, developed my soft skills such as adaptability, leadership and organisational ability. I gained the confidence to lead major work events at Shell over the years. Being able to take charge and make decisions has given me the chance to break the glass ceiling. I'm quite proud to call myself a young female engineer," she says.

In 2016, Sangeetha drew on the love, care and support of her family members and friends when cancer threw her a curveball. Things have barely changed for the 28-year-old, who got married early this year and deeply values the ties that bind.

"It has been happy chaos planning for a wedding, new home and everything in between. Working from home means not having to commute so I can spend more time with my husband. We made a pact to try a new recipe every day for dinner," she laughs.

"The one downside to moving out is that I've missed my family so much. They are so precious to me and I always end the day by facetimeing them for hours!"



On cover of:  
HEY! Issue 20

## Travelling home

**Lim Chuan Kai**  
Class of 2009,  
Mechanical  
Engineering

Work never stops for Lim Chuan Kai, not in 2014 when he was managing locals in Turkey's most populous city, and not now in 2021, still working for Singapore Airlines (SIA). It is work of a different kind though for the father of one, who moved from Istanbul to Paris and back to Singapore in 2020.

"I spent a very enriching eight years abroad living and working in some of the biggest cities in the world. We started our international journey as two and ended with three! My wife and I had our daughter, Kaeley, in 2016," says the 37-year-old.

The decision to end his globetrotting adventures came as a natural step when Chuan Kai realised he needed to do his part to take care of his ageing parents and grandmother – a duty which had rested solely on his younger brother's shoulders for eight years.

As Head of Customer Contact Services at Krisflyer in SIA, Chuan Kai's days are just as fulfilling as the time when he was a Station Manager in Istanbul managing the operational efficiency of the airline's flights. These days, he works with his team to ensure that customers' expectations are properly managed, especially with COVID-19 halting travel. One of the most challenging moments in this new role was having to formulate a strategy to deal with the 20,000 calls the call centre received at the height of the pandemic.

"I face different work challenges and exciting moments daily but now I also have my family to care for after work ends. I go to bed feeling accomplished knowing that I've done everything I possibly can for my loved ones and my company," he adds.

Looking back on his life since NTU, where he represented Hall 6 in six sports, acted in plays, competed in dance competitions and chaired camps, Chuan Kai says that a particularly impactful moment in university – and which still serves him well today – was discovering the power of autonomy and making the most of this privilege.

"It hit me in university that it was entirely up to me to decide what I wanted to do, which sports I wanted to play, when I wanted to play them and how to juggle my time between studying and playing. I was free to devote my entire time to playing, but that also meant bearing any consequences on my own. I learnt how to take ownership of the decisions I make," he says.





### Still blazing a trail

**Nur Shabnam**  
Class of 2014,  
Chemistry and  
Biological Chemistry



On cover of:  
**HEY! Issue 6**

Back in 2012, we marvelled at Nur Shabnam's ease at switching worlds. At school, she was a chemistry major. After class, she would shrug off her lab coat and swap them for sky-high heels as a fashion model.

Her transformation did not stop there. In the nine years since she graduated from NTU, armed also with a technopreneurship minor, she has worked in two companies in two vastly different fields, completed another degree in business management, attained a postgraduate certificate in data science and business analytics, and is now even the co-founder of a data analytics consulting firm, which she runs alongside her day job as a technical analyst for Mastercard.

The jump from alchemy to analytics was propitious, spurred on by her first full-time job where she was exposed to data for the first time at Agilent Technologies.

"I was intrigued by the stories data could tell if handled well. I noticed that my team's performance could improve drastically if I used our performance data to highlight our strengths and weaknesses," says Shabnam.

"It is exciting to me because what the data displays may dictate the direction an organisation takes. My global exposure when I was an undergraduate, which included an exchange in France, has made such a huge difference. Today, I'm comfortable working with clients, partners and teammates from all over the world," she adds.

The 29-year-old has also given up casting calls for calls of the creative kind: "Due to the pandemic, I found the time to draw and paint, an old pastime I had to give up when work got too busy. My latest piece is a drawing of our adorable Singaporean otters. I'm glad my work has caught the attention of an otter conservation organisation and will be used by them to spread awareness on saving the endangered species."



On cover of:  
**HEY! Issue 7**

### Cheering news

**Evangeline See**  
Class of 2013,  
Communication

She made our cover at the height of the Hallyu craze, starring in Living the Dream... Oppan NTU Style, a musical spoof of PSY's international YouTube hit put together by about 100 NTU students from different clubs and societies.

Nine years later, HEY! cover girl Evangeline See, former NTU ACES cheerleader and Wee Kim Wee School of Communication & Information graduate, isn't in South Korea but in New Zealand, where she settled down with her partner in 2018 and restarted her career in marketing.

It was difficult at first, Evangeline said, having to job-hunt in a country where she had no connections or knowledge of the work culture.

"After a temporary contract job, I landed a permanent marketing role in Philip Morris, a Swiss-American multinational. In Singapore, we don't rely as much on recruitment agencies to find a job, but it is a huge thing here, so I had to learn about that," she says.

"At work, I had to start from scratch and navigate the work norms and cultures, much of which was new to me. For example, there is less emphasis on hierarchy and more importance on visibility. It's the norm to challenge your superiors or speak your mind if you don't believe things are right. This was something I had to get comfortable with."

Tough as it was, she is thankful that her four years of hall life, team sports and cheerleading in NTU taught her resilience and independence, helping her integrate into the new environment quickly.

"Living in New Zealand turned out to be perfect for a homebody like me. I enjoy the quieter life so I go on plenty of walks in nature with my dog. The breathtaking scenery is just the cherry on top," she says.

"And when I don't have to work, I can head to one of New Zealand's many national parks, which are just a 45-minute drive away, or fly down to the South Island for a road trip. There are still many places to explore even though I've been here for three years."

Photo: Evangeline See



## Doctors in the house

Harish See, Muhammad Fadzil and Beverley Lim  
Class of 2020, Medicine

On cover of:  
HEY! Issue 32



Graduating into a world wrestling with a tyrannical virus isn't easy, and even less so for Beverley, Harish and Fadzil, three young doctors from the Lee Kong Chian School of Medicine's Class of 2020.

All three are Medical Officers and have been posted to different hospitals across Singapore. Beverley is with Tan Tock Seng Hospital in the department of renal medicine but is currently working in the National Centre for Infectious Diseases (NCID) to help see COVID-19 patients. Fadzil was posted to the cardiology department at Khoo Teck Puat Hospital and Harish is a month into his second posting at the Institute of Mental Health after spending four months at Changi General Hospital's A&E department.

For Beverley and Fadzil, there's no such thing as a fixed daily schedule. In the NCID, Beverley has to be ready for any sudden influx of COVID-19 patients or situations where her patients take a turn for the worse.

"The one thing I know for certain about my day is that I wake up at 5.45am every morning," she laughs.

"Generally, mornings are the busiest as I need to look through patient case notes and find out if anything significant happened overnight. Then I do my rounds and act on any changes in treatment plans. On better days, we can go for a coffee break after that!"

Fadzil's day similarly involves doing his rounds and writing up case reports, but in the cardiology department, an emergency could mean a life-or-death situation, where he could

see his day's plans change in a literal heartbeat.

"One of the most rewarding moments for me is seeing my patients get nursed back to the pink of health and leave the hospital better than when they first came in," says Fadzil.

"I realised the importance of communicating in a manner where patients trust you. That was something I learnt in NTU through interacting with simulated patients. I can see now that it makes a big difference in whether your patients recover quickly or not," he adds.

Beverley, too, credits the team-based learning system in NTU for helping her to adapt to the medical profession: "Solving class problems as a group closely mimics what doctors have to do daily. At work, we constantly interact with different teams and people depending on what is going on with our patients, so learning how to manage team relations as a student was invaluable."

Over at the Institute of Mental Health, Harish's day is a little more mellow. There, he works in the early psychosis intervention programme where he sees patients as young as 18 who are newly diagnosed with mental health issues. Together with other doctors, they evaluate and treat these patients as well as coordinate their long-term care.

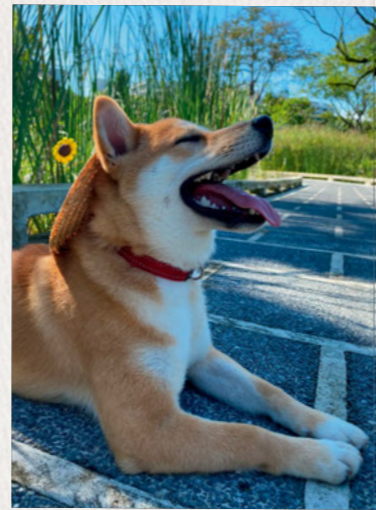
"My time in NTU gave me a stable foundation on which to grow as a junior doctor. It gave me the flexibility to explore the areas of medicine I'm interested in, such as psychiatry, which I was already keen on during my fourth year at Lee Kong Chian School of Medicine," says Harish.



# CAMPUS, SWEET CAMPUS

From vast views to navigable nooks, here's what makes NTU home

Air of pawstivity.



Aisle look on the bright side.

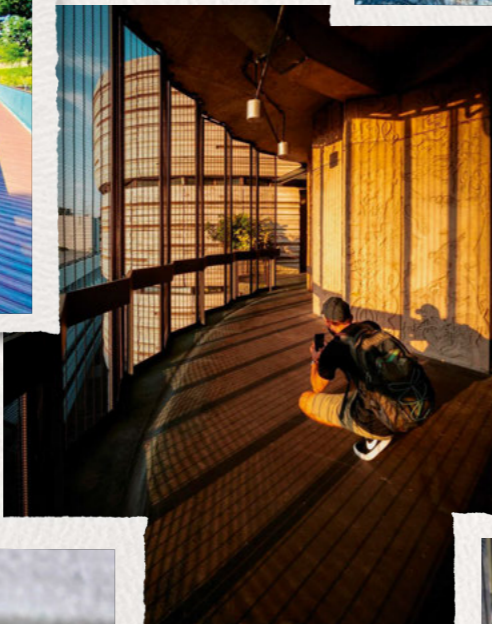


SCAN THIS PHOTO



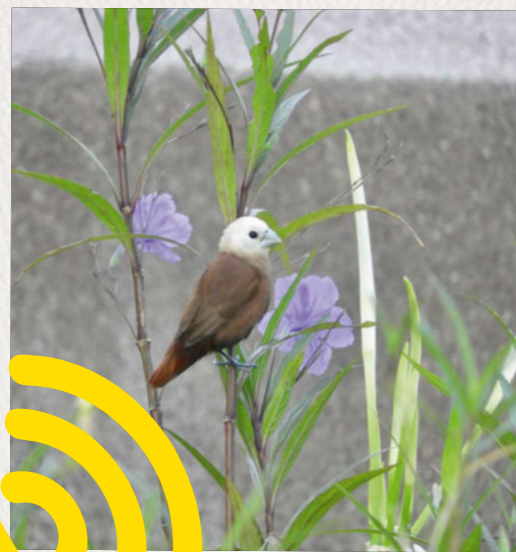
SCAN THIS PHOTO to see a corridor come to life

Give it your best shot.



Let's meet in the middle.

SCAN THIS PHOTO



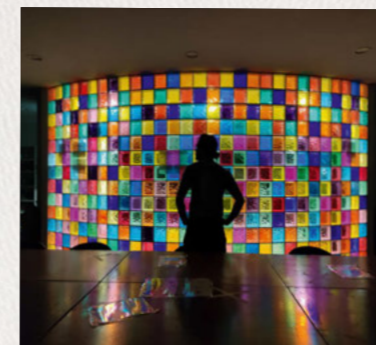
SCAN THIS PHOTO

Still waiting in the wings? Your moment is near.



Home game coming up!

Checkeder this out at Hall 8.



Ready for the next wave.



Just another moonlit night.

HEY!  
AR  
SCAN THIS PHOTO  
to hear the  
White-headed Munia  
chirping



# THE FUTURE IS 3D PRINTED

From briskly-built homes to artificial human organs and even superhero gear, the applications of 3D printing have crossed the realm of sci-fi into reality

## Body parts on demand

NTU scientists have used ink made from sunflower pollen to print parts for artificial human organs. Such organs may someday be used to replace diseased and worn-out ones, enabling us to live longer.

Using "ink" made of three types of skin cells, our researchers are also the first in the world to print human skin that matches our natural skin tones. Such skin may be used to test drugs and cosmetics, reducing the need for animal testing. Skin grafts from 3D printed human skin could also be used to help heal the wounds of burn patients.

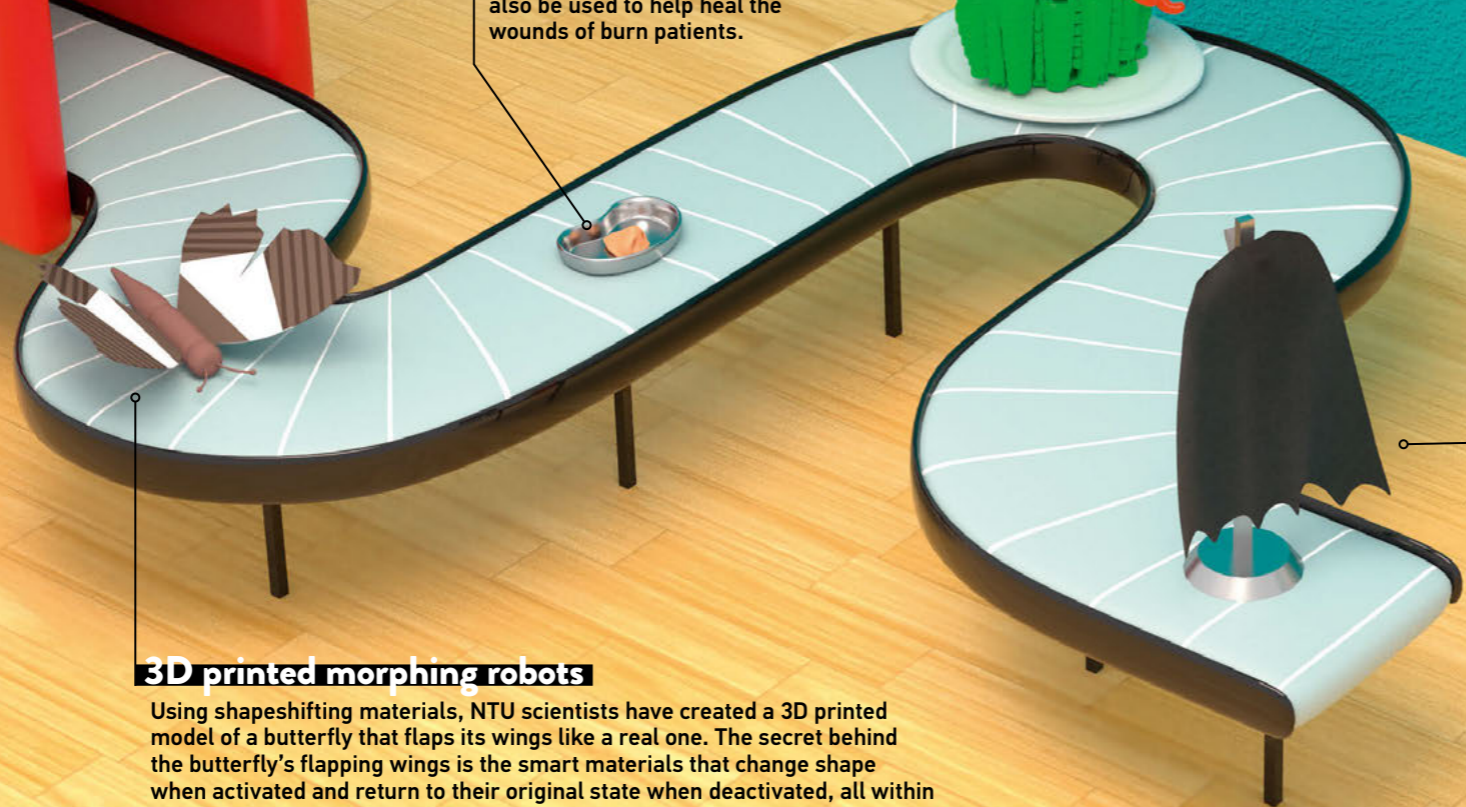
## Food in your fave shape

NTU researchers have developed "food inks" created from fresh and frozen vegetables that can be 3D printed into any shape. Fancy eating an "octopus" made from pureed carrots? Or devouring a "Hive" of pea puree? Now you can play with your food and eat it too! Patients who have trouble swallowing or weak appetites may benefit from 3D printed chow. Think pureed vegetables presented in a visually appealing way that's nutritious and tasty.

## Look at what I printed!

3D printers may be used to build the homes of tomorrow. Researchers from NTU have created the world's first 3D printed bathroom. Using special concrete mixtures, an entire bathroom can be printed using less material in about half the time it usually takes to construct one, saving time and cost.

**HEY!**  
*AR*  
SCAN THIS VISUAL to watch 3D printing make a scene in a 3D animation



## 3D printed morphing robots

Using shapeshifting materials, NTU scientists have created a 3D printed model of a butterfly that flaps its wings like a real one. The secret behind the butterfly's flapping wings is the smart materials that change shape when activated and return to their original state when deactivated, all within minutes. This technology may be used to make items such as robots or furniture that can self-assemble when triggered. Yay to desks and shelves that assemble themselves like magic!

## Get Batman's cape

Scientists from NTU have been involved in developing a new type of 3D printed fabric made from a network of interlocking shapes that is flexible like cloth but can stiffen on demand, much like Batman's cape, which turns rigid to shield the Dark Knight from enemy attacks. The invention may inspire lightweight armour that hardens to protect a user against an impact, protective gear for athletes, and wearable suits that help the elderly to stand, walk and carry objects.

# TOMORROWLAND

How NTU-made technologies are changing our future

## My sensitive robot

### NOW

Super-thin sensors printed on paper or flexible plastic sheets could become the new skin for robots. Over a hundred times more sensitive than today's pressure sensors, they can make robots touch-sensitive to "feel" knocks, bumps and even hugs. A working prototype of the sensor integrated into a robotic hand can grip delicate objects such as an egg.

### FUTURE

Working alongside robots with ultrasensitive skin could improve safety or work efficiency, such as in situations that require handling of delicate or fragile items. You also wouldn't mind working with a robot that apologises when it accidentally bumps into you. Lightweight tactile sensors could also be used in wearable health-monitoring medical devices of the future.

Great meeting you!

I can feel your love but the hug is too tight!

**HEY!**  
**AR**  
SCAN THIS ILLUSTRATION to see why you can't stop that feeling



**HEY!** SCIENCE & TECH

Lester Kok

Vivian Lim

## AI can help your heart

### NOW

A new diagnostic software powered by artificial intelligence can analyse electrocardiograms to uncover heart abnormalities in patients. This could help doctors detect the early onset of heart disease in patients with almost 99% accuracy. Heart specialists could use the new tool as part of their arsenal of diagnostic techniques that include magnetic resonance imaging.

### FUTURE

With cardiovascular disease on the rise in Singapore, this AI-powered tool could be deployed in annual health screenings where ECGs are taken and automatically analysed to identify heart abnormalities. It could also be used in wearable devices, such as smart watches, to detect or track heart conditions.

**HEY!**  
**AR**  
SCAN THIS ILLUSTRATION to see what happens next

## Easy-breezy COVID-19 test

### NOW

Need to get tested for COVID-19? Blow into this breathalyser for 10 seconds, then cap it shut and slot the tube-like device into a portable reader. By analysing the organic compounds captured on the breathalyser's chip, the device can tell in less than two minutes whether a person is infected with COVID-19 with 95% accuracy.

### FUTURE

Everyone can have their own pocket breathalyser. With features like replaceable sensor chips, personal breathalysers can be "read" after each breath test to verify if someone is infected with COVID-19. Future breathalysers might even be able to test for different illnesses to prevent community spread of diseases.



# GREAT MINDS THINK UNALIKE

What's the secret to creativity? It's not rocket science, say these NTU inventors who share tips on fuelling that "eureka" moment

"Gather your friends from different disciplines, huddle together and brainstorm together candidly, and don't be afraid of challenging each other openly. When we did that, our little ideas fed off one another and grew into one grand big thought that made perfect sense."

- Dr Long Yi, who led the research team that developed an energy-saving smart window using hydrogel-based liquid.



**A "BIG LEAP IDEA" GROWS FROM LITTLE IDEAS**

"As a team leader, it's important to keep your eye on the problem that you'd like to solve in the long term, but allow your teammates flexibility and freedom to come up with ways to move the needle on that problem in the short term. This way, they can follow their curiosity and capitalise on their strengths, yet still be part of a larger mission, which should result in a more innovative, productive and healthy team."

- Prof Kimberly Kline, whose team developed a peptide that makes drug-resistant bacteria sensitive to antibiotics again.

**CHALLENGE THE STATUS QUO**

"Creative problem solving requires you to think differently and be open-minded. Don't be afraid to be the outlier and dare to challenge the status quo. Against conventional wisdom, we used a nanomaterial as a drug instead of as a drug-carrier."

- Asst Prof Dalton Tay, whose trojan horse approach kills cancer cells without drugs. He has also used orange peels to extract precious metals from spent batteries to create new ones.

"Don't assume what everyone else assumes. When you're researching something, identify the hidden assumptions and considerations and check that they are valid. Take an approach that is off the beaten path. For example, we applied new learning materials, devices and fabrication methods to robots to mimic the way humans think and feel."

- Assoc Prof Nripan Mathews, who developed a way for robots to recognise pain and self-repair.



**HEY! AR**  
 SCAN THIS VISUAL and rotate it to see a hidden NTU icon. Snap a picture of it when you find it, then tap "Enter Contest" to stand to win a Coffee Bean gift card



**PERSIST DOWN THAT UNCONVENTIONAL PATH**

"Try out your ideas, no matter how crazy or ridiculous they may look! We used 3D printing technology to turn purees into palatable dishes that are visually appealing and nutritious."

- Asst Prof Zhang Yi, who is behind a new method of 3D printing pureed food for patients with swallowing difficulties.



"We are all capable of thinking out of the box. All we need is to be challenged and motivated to go the extra mile for that flash of inspiration. Find what motivates you."

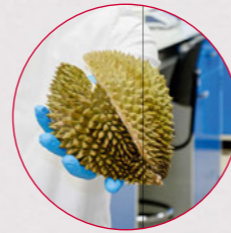
- Prof Chen Xiaodong, who inspires students and young inventors through his own innovations, such as a device to communicate with plants using electrical signals.



**HARNESS TECHNOLOGY**

"Most of the solutions to real life problems aren't rocket science. The key is to analyse the nature of the problem with an 'out of the box' mind. The solution often involves technology that already exists but the innovation is in applying it in unexpected ways."

- Prof William Chen, who created antibacterial gel bandages from discarded durian husks.



"To come up with a creative solution in robotics, start by thinking about how the process would be done manually, and what you can achieve with the use of robots. When we were thinking of how to quickly disinfect surfaces, we saw that it was both labour-intensive and repetitive. With our robot, a human operator could control the disinfection faster and from a safe place."

- Prof Chen I-Ming, creator of numerous robots, including one that helped disinfect the NTU campus during the COVID-19 outbreak.



# A NOD FOR THESE MODS

Struggling to decide which elective to take? Here are some recommendations from your NTU seniors who have been there, done that

## 1. FASHION & DESIGN: WEARABLE ART AS A SECOND SKIN

National Institute of Education

**Take this course if...** you want to design and construct your next #OOTD that doubles as art.

**Expect...** to dabble with experimental designs once you have learnt the

basic techniques of apparel making. As third-year Chinese major Desmond Toh puts it: "The best design is found when we are adventurous enough!" You also become more aware of how to identify a good piece of garment, and realise that almost anyone can pick up fashion design.

**TIP: Don't be daunted by your lack of sewing skills. This course is beginner-friendly. If you already know how to sew, you'll be creatively challenged out of your comfort zone.**

Engineering student Jolene Koh in her wearable creation with a shoulder strap inspired by the spiky roof of Esplanade - Theatres on the Bay.



**"USING UNISEX COLOURS AND PLAYING WITH TEXTURES CAN CREATE A MORE RUGGED VIBE THAT MAKES FLOWERS SUITABLE ON MENSWEAR."**

-Desmond Toh



## 2. E-STARTUPS & SOCIAL MEDIA STRATEGIES

Nanyang Technopreneurship Centre

**Take this course if...** you want a foot into the start-up scene.

**Expect...** generous insider tips from industry experts and entrepreneurs on what it takes to start your own business in this digital age. Aside from learning about social media marketing and social media tools, you will also get the opportunity to do elevator pitches and present your own business venture. "This course has helped me to build up my confidence to speak to a large group of people comfortably," says Shanna Ng, a final-year communication student.

**TIP: If you don't plan to launch a start-up but are naturally inquisitive and open to meeting new people, this course will be right up your alley.**

## 3. GENDER AND DIVERSITY STUDIES

School of Humanities

**Take this course if...** you are keen to understand gender and sexuality.

**Expect...** intense conversations about gender and inclusivity that will encourage you to develop your own thoughts on the subject. Says final-year communication student Lauren Elizabeth Lim: "It pushed me to think further and more critically about these topics and helped me to empathise with people of different sexualities or genders."

**TIP: Put aside your preconceived notions about this topic and get up to speed with topics in gendered identity and the debates about diversity.**

## 4. THAI LANGUAGE LEVEL 1

School of Humanities

**Take this course if...** you aspire to watch Thai dramas without subtitles and order street food like a pro at Chatuchak Weekend Market when borders reopen.

**Expect...** a virtual cultural immersion. Says final-year mathematical sciences student

Celine Chan: "On top of teaching us the language, Dr Sureenate Jaratjarungkiat also taught us to appreciate the culture through the language of food. She even provided us with ingredients and hosted a live broadcast to teach us how to cook Thai cuisine."

**TIP: Flatten the steep learning curve a little by taking the class with a friend whom you can regularly practise the language with.**



**HEY! AR**  
SCAN THIS PHOTO to join the iced tea party!

## 5. DISCOVERY AND DEVELOPMENT OF THERAPEUTIC ANTIBODIES

School of Biological Sciences

**Take this course if...** you want a front-row seat to the latest developments in the field of antibody therapies.

**Expect...** engaging and clear lectures on the topic from Dr Ignacio Asial, who leads a biopharmaceutical company that

specialises in developing next-gen antibody therapies. "The module also helped me to better understand the news on the development of COVID-19 therapies globally," says Gladys Koh, a third-year biological sciences student.

**TIP: This module will also provide you with a plum opportunity to hone your skills in presenting scientific concepts.**



## 6. SCIENCE FICTION FILM

Wee Kim Wee School of Communication & Information

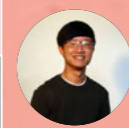
**Take this course if...** watching and analysing sci-fi films is your thing.

**Expect...** sci-fi films across a diverse range of topics such as feminism and artificial intelligence, and the interactive discussions that follow. Third-year physics student Ong Rui Xun says: "Even though the older sci-fi films may

be anachronistic to the point of being outdated, they have helped me to understand how far we've come as a society and civilisation."

**TIP: Make friends in the class early on so you have someone to watch the films with - you may make a film buddy for life!**

HEY! STUDENT WRITER



When Kun Liang is not writing, he works closely with young children of diverse abilities as a volunteer. He hopes to leverage his communication skills and knowledge in early childhood education to advocate for progress on inclusion in Singapore.

10 years

34 awards

# HEY!

50 covers

## CELEBRATING A DECADE OF HEY!

THANKS FOR  
BEING ON THE  
SAME PAGE

**HEY!**

*AR*

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**WIN!**

