SEE PAGES COME ALIVE
WATCH 3D ANIMATIONS POP UP FROM THE PAGE
PACKED WITH AUGMENTED REALITY

HEY! VOL. 44                  JAN - FEB '20

SERENE IN THE DAY, MAGICAL AT NIGHT

GORGEOUS YUNNAN GARDEN

SCAN THIS PAGE for a 360° view of the garden.
“An internship that made my learning come to life”

Pavatharani Senthil Kumar
Renaissance Engineering Programme
Interned at Dyson in the United Kingdom and Singapore
Spent a year at Imperial College London, NTU’s partner university

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Hover your phone over the page to explore objects like the snowy Hive on the cover of Vol. 43

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PLACE 3D ELEMENTS IN YOUR ENVIRONMENT

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PUT A NEW SPIN ON OBJECTS THAT ARE ANCHORED TO PAGES

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PLACE 3D ELEMENTS IN YOUR ENVIRONMENT
THE REJUVENATED YUNNAN GARDEN, A GREEN LUNG IN OUR URBAN CITY, IS NOW A NINE-HECTARE PRECINCT FOR LEISURE, EDUCATION AND HERITAGE, UPDATED FOR TODAY’S GENERATION OF STUDENTS.
Built in the 1950s, Yunnan Garden was a key attraction of the Nanyang University campus, the land on which NTU now sits. Today, it is seamlessly integrated with the Chinese Heritage Centre and an expanded Nanyang Lake following the diversion of a stretch of Nanyang Drive in front of the Chinese Heritage Centre, which now runs alongside the Pan-Island Expressway.

The result is a nine-hectare heritage precinct – bigger than 12 soccer fields – that preserves the garden’s legacy while enriching it as an educational and recreation hub, making it a go-to place in NTU not just for the university community, but also residents of the wider Jurong neighbourhood.

To preserve the garden’s historical significance, its iconic features and monuments, including the Senegal Mahogany trees from the 1960s, were retained. The grass slope in front of the Chinese Heritage Centre still bears the Chinese saying: “To thrive in adversity, to strive and improve oneself constantly” – words that will continue to resonate with future generations of students.

Credit: Chinese Heritage Centre
Nature enthusiasts can explore the garden’s rich biodiversity through its mini gardens and trails centred on various themes, such as orchids, herbs, pitcher plants, national flowers and plants for cosmetics. There is also a butterfly garden and lily garden.

The garden’s design, a series of loops and geometric patterns, is inspired by elements from traditional Chinese gardens and the formal, symmetrical and highly ordered gardens of the French Renaissance period. Low kerbs that run along some walkways echo the ones found in traditional Chinese gardens, with new secondary footpaths created for easier access.

More than 1,100 new trees from over 80 species were planted, along with a quarter million shrubs, making the garden even more attractive to insects, birds and other native fauna. The tallest trees have also been protected from lightning strikes.

This 5.6m-tall waterfall brings the expanded Nanyang Lake into Yunnan Garden. Water flows through it to the wetlands in the lower garden as part of a stormwater management system that collects and purifies rainwater. Artificial wetlands with layers of sand and gravel not only filter the water in Nanyang Lake but are also habitats for flora and fauna.

The Chinese Heritage Centre, now seamlessly connected to Yunnan Garden, features a new lawn and a water playground for kids. Other iconic monuments and structures retained in the garden are the replica Nanyang University arch, Nanyang University Memorial and the red pavilions.

Anatomy of the garden
Past and present come together in this refreshed space
Discover what’s so special about these herbs. And see how other plants do double duty at the other themed gardens and trails.

Did you know that the water body now known as Nanyang Lake was laboriously dug by Nantah students in 1967? It is now 3.5m deeper and surrounded by mini gardens that are accessible by boardwalks. Witness its transformation over the years here.

Beautiful AR koi fishes will remind you to refrain from fishing to ensure the natural ecosystem is not disturbed.

Take turns with your pals getting into the camera frame for fun shots at the waterfall with friendly AR animals such as otters and flamingos.

Watch the past come to life in this video with old photos and historical snippets of these heritage landmarks.

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Watch the past come to life in this video with old photos and historical snippets of these heritage landmarks.

Your virtual tour guide
All you need to explore the many facets of Yunnan Garden is your phone and the NTU HEY! AR app. Head for these five locations and scan the AR markers there for some interactive fun and a mini learning experience.

A vibrant space for all
Aside from preserving heritage, the garden aims to be a vibrant recreation and gathering space that has something for everyone.
Park after dark

Like a sky full of stars, this ecological corridor never sleeps with its well-lit paths and lookout points. The garden harnesses energy-efficient lighting that includes solar-powered lamps, and its safety features – 53 CCTVs and several emergency call buttons – also make it friendly to all visitors.
FILLING A HOLE IN HISTORY

A millennia-old mystery might just have been solved. Almost 800,000 years ago, a two-kilometre-wide meteorite struck the Earth, fusing debris across Asia, Australia and Antarctica. Its exact location, however, remained a mystery, until now perhaps. Earth scientists from NTU have found evidence that suggests the crash site is buried in the lava fields on the Bolaven Plateau in southern Laos. Studying the site of the impact is next in the pipeline, as it could paint a picture of what might happen to us if another similar event took place.

WHEN ART IMITATES LIFE

The year is 2119 and all marine life is extinct. With only secondhand descriptions, a marine biologist builds mechanic sculptures resembling jellyfish and other aquatic animals. This is the premise of School of Art, Design & Media grad Bao Songyu’s winning entry in the student category of the inaugural NTU Singapore Global Digital Art Prize, a biennial international competition started by NTU President Prof Subra Suresh. In the professional category, Berlin-based artist Marco Barotti beat over 440 other entries to claim top billing. His audiovisual installation, Clams, is made up of clam-shaped sensors that can be placed in any aquatic environment to measure its level of pollution.

FLYING HIGH

Another year, another rise in rankings for NTU – this time in the Quacquarelli Symonds (QS) Asia University Ranking, where the university rose by one position to No. 2. NTU was second to none in research impact and received perfect scores for citations per paper, international research network and international faculty and student ratios. NTU’s faculty received further plaudits from Clarivate Analytics, which ranked 33 NTU scientists among the world’s most influential minds in the top one per cent in their research fields. Of these scientists, 15 were recognised for their performance in more than one field of study, and nine were experts in Materials Science.

KEEP WHAT YOU NEED

Can you imagine not being able to save or upload photos? This apocalyptic scenario is a possibility if our data saving habits continue. Research from NTU has found that we are on course to reach 175 zettabytes (10¹⁵ megabytes) of data storage by 2025. If we put this into Blu-ray discs and stack them, they would reach the moon and back several times over. At this rate, the growth rate of data production will overtake that of storage capacity in about 200 years. You’ve Marie Kondo-ed your closet. Now it’s time to do the same to your data.

SOFT SPOTS FOR ANIMALS

Just like us, animals wouldn’t take too well to highways being built in front of their homes. And animals in the tropics are particularly sensitive to disturbances in their habitat, say environmental experts from NTU, who found that tropical wildlife are dependent on large, unbroken areas of forest landscape. Building green corridors, or creating smaller areas of forests, should not be done at the expense of disrupting large areas of forest. This study has implications for the design of wildlife reserves, wherein there’s a longstanding debate about whether it’s better to have many small ones, or fewer large ones.
I WONDER ...

If we could hear the thoughts of students who are considering NTU, what would they be? Use your phone to scan the page for the answers to these commonly asked questions.

“Where will medical students attend lessons?”

“What’s special about the Renaissance Engineering Programme (REP)? I heard it’s the number one engineering programme in Singapore.”

“If I don’t live on campus, what’s the best way to get to NTU?”

“What kind of food is there in NTU?”

“My friend went overseas twice as an NTU student. Can I do the same?”

“What scholarships can I apply for, and would I qualify for them?”

“Is it difficult to get a room on campus?”

“Do I have to pay more for a double degree programme like the Business & Computer Engineering programme? What other double degree programmes are available?”

“It would be perfect if we were roommates! Can we choose our roommate?”

“Will it be easy for me to get around this large campus?”

“It would be perfect if we were roommates! Can we choose our roommate?”

“What’s special about the Renaissance Engineering Programme (REP)? I heard it’s the number one engineering programme in Singapore.”
WHEN
NTU PRESIDENT
meets
STUDENT PRESIDENT

NTU Students’ Union President Bryan Chiew sits down with NTU President Prof Subra Suresh to discuss how the university can reimagine education for a world disrupted by technology.

Bryan Chiew: Prof Suresh, my generation grew up with technology in our lives, and we feel the need to be connected to the world 24/7. As an academic with deep insights on the impact of Industry 4.0, what do you think the success or failure of technology hinges on?

Prof Subra Suresh: The critical thing is the human interface of technology and related to that is the ethics of using technology. For example, we can use artificial intelligence to make certain decisions for us. But can it make the right ethical decision when needed?

Digital hygiene, respecting people and their privacy in cyberspace, knowing where to draw the line, cyber security – everyone needs to be aware of these things. At NTU, we want to sensitise you to not just the sophistication and also its potential downsides. This is what we can do for education, as a university that does cutting-edge explorations in all of these.

B: As a second-year public policy student, I have taken modules about e-governance, and how using technology effectively and ethically is a new and important challenge to democratic institutions. I find that the line between disciplines seems to be increasingly blurred.

S: Yes, broadly speaking, in this digital age, there is no distinction between the physical, digital and biological worlds. There’s no clear demarcation line between personal and professional matters – it’s all blended together.

B: These blurred lines seem to be changing the workplace as well. What does this mean for me and my fellow NTU students?

S: It means that moving forward, it’s unlikely a graduate of today is going to work for the same company for 40 years, for example. It’s also a lot less likely that most of the young people will only want to work for big organisations. There are many more start-up, entrepreneurial and gig economy opportunities today than 20 years ago.

B: That’s also very likely that with medical advances, you will live and work longer than previous generations. You will not only change jobs more frequently; you may even change professions during your productive career. So if you take all that into account, it’s impossible that you’ll acquire all the information you need in the next 50 years in your four years at NTU, or any other university.

S: After spending four years to get a degree, you will become an expert at something. But more than learning about something, a university education should be about learning how to think, and preparing you to ask the right questions throughout your life so that you can figure things after graduating and beyond.

B: Going by that trajectory, is it time for university education to be redefined so that we can robot-proof ourselves?

S: Yes, broadly speaking, in this digital age, there is no distinction between the physical, digital and biological worlds. There’s no clear demarcation line between personal and professional matters – it’s all blended together.

B: The leadership academy sounds like a good initiative. Any other words of advice for us?

S: Show up for class so you can get to know many professors and fellow students! I sometimes joke that the person you are sitting next to at a lecture may be the CEO of a large company 20 years from now. So be nice to them now, and they’ll be very helpful later. Jokes aside, do take the time to develop friendships and networks, and engage with your professors. Your three or four years on campus will be the best time of your life, so make full use of all that NTU, and its global networks, has to offer. You don’t have to confine yourself to one particular field in your four years here. If there is a public lecture on campus that is not in your field, go for it. Because once you start working, or have a family, you may have less time for this.

B: Thank you, Prof Suresh. It has certainly been an enlightening chat.

S: It was my pleasure, Bryan.
Before heading to Australia for a six-month exchange programme at Swinburne University, communication student Sergul Tohpings his senior, art student Muhammad Jafri Bin Jaafar, for some quick advice.

**Sergul Toh:** Jaf, heard you just came back from exchange last sem??

**Jaf:** Yup, went to the University of Hertfordshire in the UK.

**Sergul Toh:** Wah UK!

**Jaf:** Must've been shiok to travel so far.

**Sergul Toh:** Yup it was great!

**Jaf:** Managed to snag several good shots on my travels as well.

**Sergul Toh:** Like these^

**Jaf:** Like these^

**Sergul Toh:** Wah hahaha sick shots man

**Jaf:** Expected nothing less from an ADM student😊

**Sergul Toh:** Thanks hahaha!

**Jaf:** I'm actually gg on exchange next sem and I need some help.

**Sergul Toh:** Can I ask u sum questions?

**Jaf:** Sure, fire away

**Sergul Toh:** Well first up I'm gg to Australia and I'm v confused by the module matching thingy...

**Jaf:** Oh, I managed to clear 2 cores and 2 major PEs in the UK.

**Sergul Toh:** But different schools have different restrictions so you should check out the requirements that you need to meet.

**Jaf:** Ooo but were you able to match the modules with ease tho?

**Sergul Toh:** I wouldn't say it was easy, but still rather manageable.

**Jaf:** You can check for courses that have already been matched by seniors, or you can submit a new request through INTU.

**Sergul Toh:** I was also able to explain my overseas module to my NTU prof, who eventually accepted one of my matching requests.

**Jaf:** Oh wow, didn't know you could do that...

**Sergul Toh:** What about your accommodation? You stayed in a hostel or...?

**Jaf:** Yup I chose to stay in the hostel.

**Sergul Toh:** There are pros and cons.

**Jaf:** The upside is that it is a reliable form of accom, and that you are closer to your classes.

**Sergul Toh:** If you even go for classes, that is😊

**Jaf:** I also got my own bed and toilet, and there's a kitchen in flat.

**Sergul Toh:** Oki will do that man!!

**Jaf:** I see, but I heard hostels are more expensive?

**Sergul Toh:** You see, but I heard hostels are more expensive?

**Jaf:** This is true for my case, not sure if it's always true though.

**Sergul Toh:** Hostel cost me like $6k for 5 months.

**Jaf:** I know other students who went to the UK as well, and spent like $2k for 5 months through airbnb.

**Sergul Toh:** BUT they had to share a room with twin beds and also the toilet so it's really based on your preference.

**Jaf:** Wow, that's quite a diff huh.

**Sergul Toh:** I get what you mean, it's nicer if we don't have to share a bedroom and the toilet and all LOL.

**Jaf:** Any other tips ya got for me?

**Sergul Toh:** Hmm, there were a few things I could've done to save some time and money.

**Jaf:** Over there, I needed to take a coach to travel quite frequently. Turns out I could've saved quite a bit if I'd gotten a coach concession pass😊

**Sergul Toh:** You should calculate if it's worth it for you when you're on exchange too.

**Jaf:** Oh and bring a photocopy of your passport, visa and student admission letter whenever you travel.
HE Y! STUDENT WRITER

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

Glossary

Module matching: Also known as the Online Course Matching Updating Module, it is used by students going on exchange to ensure the course credits obtained from the module they plan to take at the overseas university can count towards their NTU degree.

PEs: Short for “Prescribed Electives,” which students must complete in order to fulfill the requirements of their degree programme.

HELPING HANDS

Students band together to support the university community

Tristan Goh is on a mission to deliver meals to students on a leave of absence because of the novel coronavirus situation. He says he wants “to make a statement”, as he sees it.

“There are plenty of misconceptions surrounding the virus, like how those on a leave of absence are all virus-carrying and must be shunned. But they are not high-risk. By doing this, I’m showing that we’re all the same – we’re all humans,” says the second-year student at the National Institute of Education. He had just returned from his Lunar New Year break. “I saw how people would keep a distance the moment they heard someone speaking in Chinese at malls and markets in Bangkok,” says the 23-year-old, who is also President of the Trainee Teachers’ Club.

“I didn’t want to see the same happen in NTU. After all, we are an international community.”

He is not alone. An army of student volunteers have been turning delivering three meals a day to affected students living on campus.

The 14-day leave of absence is mandatory for NTU students and employees with recent travel history to China and is part of precautionary measures to stem the spread of the virus. The actions of the students have not gone unnoticed.

Both National Development Minister Lawrence Wong and Education Minister Ong Ye Kung lauded the kind gesture, with Mr Wong calling it the “Singapore Spirit” that would enable the country to prevail against the virus. Mr Ong, meanwhile, joined students in delivering welfare and food packs on 3 February. NTU’s leadership team also lent their support to the students.

“We know it doesn’t really feel good and it can get lonely staying in the room. So we hope to at least bring some cheer by taking care of their meals during this time,” says Si Min. It’s really not just about filling bellies this period, but warming hearts too.

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PEs: Short for “Prescribed Electives,” which students must complete in order to fulfill the requirements of their degree programme.
In a prickly project work situation? NTU experts offer some advice on handling difficult teammates

**An egotist**

Traits: He thinks he is better than everyone else. He hardly attends meetings as he thinks it a "waste of his time", and when he does, he is always critical, especially towards me. He shoots down my ideas,ameda 90% of my presentation slides, and talks to me as though I shouldn’t be in the group.

“Sometimes, people aren’t aware that their behaviour can offend others. Deal with this as a group instead of between the both of you. Keep the discussion focused on the behaviour rather than on the person.”

– Assoc Prof Trevor Yu

“Ask him some factual questions about the changes he has made to your work to find out his motivation. Take a step back to evaluate the situation before jumping to conclusions. Try to see things from his perspective.”

– Counsellors from the University Wellbeing Centre

“It’s okay to tell him that his behaviour is hurtful and that you do not like it. For future group projects, I recommend that you and your team spend some time getting to know one another outside of school before you start on the project. This helps the members become comfortable with each other. For now, take this as an opportunity to learn about yourself and how you react in these situations.”

– Dr Catherine Peyrols Wu

**A princess**

Traits: Like a ghost, this person doesn’t seem to exist. He hardly replies to emails, doesn’t appear at meetings, and never replies to text messages. We heard that he is someone who leaves things to the last minute. Should we trust that he will do his part before the deadline or should we just go ahead and do his part so we don’t have to panic at the end?

“Find out if he is facing any difficulties (such as juggling a part-time job with school) that might cause him to leave things to the last minute. Perhaps he hasn’t realised his behaviour is causing frustration and stress to the team. Your group leader could approach him privately and tactfully to give him feedback and offer help. If there is no improvement after your efforts to engage him, then you may want to speak with your professor about the situation.”

– Counsellors from the University Wellbeing Centre

“In my experience, when a member becomes a ‘ghost’, there is often more to it than the person simply being a free-rider. I have seen serious students disengage and even disappear from teamwork for a host of reasons including difficulties coping with work, personal problems, health issues and so on. International students can become discouraged in group discussions due to culturally different work habits. There’s no easy fix to make your friend reappear, but you could try asking him if everything is okay and extend help if he is having a hard time.”

– Dr Catherine Peyrols Wu

**AWOL**

Traits: He quietly makes changes to our work without letting us know or explaining why he has to be the final “overseer”. He only explains the amendments if we ask him outright. We have tried to tell him the changes aren’t needed, but he says our original work sucks and would not get us a good grade. This need of his to control everything extends to our presentations. He tells us how to speak and what to say. I can see where he’s coming from and I appreciate the effort he has put in, but the fun of learning gets sacrificed.

“Decide early on as a group how the meetings should be held. Lay down the rules of when, where, who and what. These are the fundamentals of good project management. The group should also decide on appropriate and fair penalties for members who violate these rules.”

– Assoc Prof Trevor Yu

“You can plan to attend the meeting for a given amount of time and then leave early to return to your revision. Propose an agenda ahead of the meeting to make it fruitful and efficient. Fix the subsequent meeting dates and get everyone in the team to agree to keep those dates.”

– Counsellors from the University Wellbeing Centre

**A control freak**

Traits: She always seems to get preferential treatment. She doesn’t do her part, even with more than a week to do the work. Then she asks for the meeting to be rescheduled to suit her but it’s not a good time for me as I have a test the next day. I wouldn’t be so upset if my teammates were at least fair about it.

“Occasionally, you’ll have to work with people that you find hard to deal with. My advice is to assess the costs and benefits of continuing the relationship. In this scenario, the cost is feeling constantly trained and discouraged. The benefits, on the other hand, would include learning new ways to work better and improve your presentation skills. Your decision to continue the working relationship depends on your personal analysis.”

– Dr Catherine Peyrols Wu

For future group projects, I recommend:

- Have clear lines of responsibility, roles and accountability.
- Propose an agenda before the meeting for a given amount of time and then leave early to return to your revision.
- Propose an agenda ahead of the meeting to make it fruitful and efficient.
- Fix the subsequent meeting dates and get everyone in the team to agree to keep those dates.
- Pay attention to the behaviour of your teammates.
- Learn about yourself and how you react in these situations.
- Take this as an opportunity to learn about yourself and how you react in these situations.
- Take a step back to evaluate the situation before jumping to conclusions.
People from around the world flock there like bees to honey. Not just one of Singapore’s most Instagrammable buildings, The Hive, NTU’s learning hub, inspires everything from sketches and paintings to wedding photo shoots.

“I was commissioned to do a series of sketches, one of which was The Hive. I did my bachelor’s degree at NTU and lived in the hall, so going back to NTU was nostalgic. The Hive was built after I graduated, so it was my first time seeing it. I found the architecture interesting and comforting – futuristic but with a natural vibe. The plants grown as part of the façade fit the brown building design well. The round shapes also give a gentler and more welcoming feel than the other angular buildings on campus. Much of my art revolves around the theme of nature. I am heartened that NTU has taken an active role to create sustainable buildings like The Hive. As an art therapist who incorporates nature into my therapy and community arts work, I am also interested to find out more about the social enterprises, community spirit and cross-pollination of ideas that The Hive aims to encourage.”

Chan Shu Yin
Nanyang Business School alumna, art therapist and founder of Creative Earth Art Therapy

“We brought 12 primary school students to The Hive for an outdoor drawing experience. The students found the structure of the building unique. Most of them live around Jurong West, near NTU, so the experience felt close and dear to them. They were excited to draw The Hive and for some of them, it was their first time going outdoors to draw.”

Jasmine Chen
Principal of Butterfly Art Studio

“We were so impressed by how glorious The Hive looked. Inside, everything is arranged in hexagons and there’s greenery everywhere. Its outer shape looks special, like stacks of Chinese dim sum baskets. We were inspired to create our art pieces and all of us enjoyed our time there. I hope that I can return soon to draw this spectacular building again.”

Oscar Guan
12-year-old student of Butterfly Art Studio

“My friends and I visited The Hive and also NTU’s School of Art, Design & Media, buildings that are quite famous in the architectural and engineering fields, which we’re in. We had an art session at The Hive. It’s a good place to hang out at because it is well ventilated despite having no air-conditioning in the hallways. The building is also strategically designed with natural lighting. Being an architect, my design philosophy gravitates towards organic architecture, and this building exemplifies the ideals that I truly admire. There is a harmonious balance of the different users’ activities and the natural environment outside.”

Hazel Angeli Lapastora
Architect

Butterfly Art Studio student Leong Shu Han’s artistic interpretation of The Hive when she was eight years old.
“The couple are recent NTU graduates. I used the bride’s movement to echo the outline of The Hive. Here, the bride is twirling to mimic the shape of The Hive, and to show freedom and blissfulness. As a photographer, I am very taken by The Hive. Its exterior exudes warmth while its interior is cool, creating two different feels at the same location. This variation of styles makes it an ideal place for photoshoots. It’s so easy to spend the entire day shooting there.”

Ares Su Lifestyle photographer

“I sketched The Hive after receiving my letter of admission to NTU’s master’s programme. I was overjoyed! The Hive is one of NTU’s iconic spots and many people love to take pictures of it and with it. I was attracted to the building’s structure — it really looks like a beehive! One of the best things about The Hive is how easy it is to have discussions there. My friends and I go there for group meetings. It’s a wonderful place to sit at and talk about our ideas. I’ve found many good friends there.”

Gopi Krishna Ayyappan Currently pursuing a Master of Science (Electronics) at NTU

“It’s a must-visit place in Singapore. I love the unique design of The Hive. Architect Thomas Heatherwick’s works are amazing. At The Hive, you’ll feel like you’re on the other side of the world and not in Singapore because the building is so raw and unfinished. I like the facade and internal space — it is open and humble. I felt I was sketching and looking at a beautiful lady, and was never bored. I was inspired as an artist to always strive to create something unique and different, just like The Hive, and have people similarly coming from afar to see my works.”

Ohm Chongthanatrakol Thai artist and interior designer

“Stepping out of my comfort zone opened up new possibilities”

Teh Wen Qi Accountancy and Business
Overseas exchanges
HEC Montreal, Canada
Sungkyunkwan University, South Korea
Internships
BlackRock, MUFG Bank, S&P Global Ratings
ALL ABOARD THE VIRTUAL CAR

This class pays heed to the adage that “you learn best by doing.” Donning virtual reality (VR) head sets, students lay their hands on what look like car engines and start twisting and turning the parts. In less than 10 minutes, they’ve each assembled the engine for a race car. Next, they put the newly-installed engine to the test to see if their race car can beat the clock. Who is going to crash and burn two seconds in because they didn’t put the right parts together?

Final-year Mechanical & Aerospace Engineering students get real in such immersive and interactive tutorials at the The Hive’s VR-enabled flipped classroom once or twice each semester. Divided into groups, they take turns wearing a VR headset to complete tasks such as assembling the car engine or operating heavy machinery. The rest of the students, wearing 3D glasses, can clearly see what their peers are doing. The group then debates the pros and cons of using VR at work and how else it can be applied in Industry 4.0. Assoc Prof Cai Yiyu, who teaches the class, explains the beauty of using VR in his teaching. “Students may not get much of a chance to work directly with industrial equipment as it can be too expensive or too dangerous for novices to handle. It’s also hard to access such equipment as complex machinery may be required to lift the heavy parts. VR simulation solves all these problems.”

ANATOMY INSIDE AND OUT

There’s a new tool in the doctor’s toolkit, and it’s hyper-realistic, making it easier to master the human anatomy. Using an augmented reality (AR) app lets first- and second-year medical students examine life-sized organs like the heart (left) in vivid detail to crystallise learning. They can isolate different parts of the heart, such as the veins and arteries, with a few taps. Zooming in on a particular part brings up a short description and its microscopic structure.

Asst Prof Reddy Mogali, Head of Anatomy at the Lee Kong Chian School of Medicine, says this is one of several state-of-the-art ways doctors-in-training at NTU learn about the human body. “We have a virtual anatomy table that allows students to rotate and dissect a simulated patient, and also plastinated human bodies and 3D-printed organs that they can hold. But these are restricted to the classroom. With AR models on an app, students can continue learning anywhere, anytime,” he says. Asst Prof Mogali’s team is now hard at work adding more virtual organs to the database.

There’s more. A holographic screen helps engineering students get up close and personal with a giant internal combustion engine floating in mid-air. The VR immersion cube puts students in a high-security manufacturing plant that they might otherwise gain access to in the real world, and they even get to fiddle with the machinery.

Such unconventional lessons, for 30 to 40 learners at a time, are necessary in the digital age, says Prof Seah Hock Soon, the director of the centre, which also facilitates the game design course run by NTU’s computer science and engineering school. “In one class assignment, students explore the aesthetics of game art and game design, then use the facilities here to come up with a game prototype. Industry experts help assess their creations in terms of gameplay, art design, skills and commercialisation potential,” he says. “NTU students will be helping to shape the evolution of 3D and 4D, not just in gaming but every aspect of our lives, so they need to experience and be conversant with these worlds now,” he adds.
Meet two modern-day heroes who serve and speak up on behalf of vulnerable communities in Singapore

Virtual reality (VR) devices are no longer just for the generation of tech-savvy youths and professionals. NTU alumnus Eugene Soh is now using them to help those with dementia see the world outside.

“It started out as a favour for a friend’s research project at a nursing home in 2018, where the elderly residents could explore different parts of the world by putting on my VR goggles,” says Eugene, who graduated from the School of Art, Design & Media in 2013.

The project was subsequently featured on CNA and later earned him the first prize at a Singapore hackathon in September the same year.

Founding Mind Palace was a way to continue this work, says Eugene, who has been a tech-artist for seven years. The social enterprise lets patients with dementia, who may be immobile, immerse themselves in familiar and new experiences through the use of VR technology. Some VR scenes incorporate the patients’ loved ones to jolt their memory.

“My reward for running Mind Palace is seeing the seniors smile and hearing about their memories,” says Eugene.

Similarly with a heart to serve, second-year communication student Leow Sue Yu, 21, gave her time to Migrant x Me, a social enterprise that runs programmes, often in partnership with schools, to help young people better understand the lives of migrant workers.

A visit to a dormitory for migrant workers over a year ago convinced her to do her part.

“I never really knew about the workers’ living conditions, because nobody around me talks about them. Understanding and witnessing their struggles really helped to humanise them,” she says.

Sue Yu conceptualised and ran Migrant x Me’s public campaigns and social media platforms.

“Stories are a way to people’s hearts. I hope to share more stories of the migrant workers and volunteers on social media, so that we can slowly change perceptions.”

She is heartened that the group’s work is making an impact.

“We started with only six volunteers, but now we have over 30.”

For Eugene, 32, who is the “Chief Dude” at his own creative tech studio, Mind Palace is a necessity.

“The young people now – me included – could potentially be part of the growing dementia population, and before that happens, we ought to find ways to make things better for everyone,” he explains.

Eugene adds that “being able to explore new technology” in his various pursuits is what keeps him going. He is now creating fun immersive experiences for the elderly that involve wall projections and motion sensors.
KEEPPING UP WITH THE DAILY GRIND

Synonymous with late nights and hectic schedules, coffee has become a staple for university students. NTU students spill the beans on their go-to caffeine fix.

1 FOR THE COFFEE CONNOISSEURS: CO-OP CAFÉ, THE HIVE

Tucked at the basement of The Hive is the Co-Op Café, which prices its coffee higher than what is found in canteens. But those extra dollars count for something: The café gets its beans from Toby’s Estate, a Sydney-based specialty café and roaster. To let the characteristics of these Arabica beans shine, they are roasted without additives such as margarine and sugar.

Final-year NTU student Bhalaji Karuppusamy, who keeps his distance from instant coffee, finds the coffee at the Co-Op Café worth every penny. “I find that generally, the coffee sold on campus tastes burnt because the beans are roasted for too long. But the one sold at The Hive is good,” says the final-year electrical and electronic engineering student as he sips on his iced latte.

TIP: Get your caffeine fix faster with the express coffee queue during peak hours.

2 FOR THOSE WHO LIKE IT BITTER: NORTH SPINE FOOD COURT

If coffee is just a means to an end, then aroma and flavour can take a back seat to make room for bitter endurance. As first-year business student Jeffrey Goh puts it: “There’s a difference between having coffee to stay awake and having coffee to enjoy its taste.”

“I like the coffee at the North Spine’s food court because it’s not too acidic and has the right sweetness. I get my coffee there not just because it’s convenient. I also prefer the taste,” says first-year social sciences student Serena Lon.

TIP: Not passing by the North Spine today? Try the kopi at the Quad café instead, an equally popular alternative.

3 FOR THE TIME-STARVED: BREW IT YOURSELF

If you’re pressed for time, 3-in-1 coffee sachets may be your best bet. All you need to do is locate a hot water dispenser, which can be found on campus within faculty buildings or near lift lobbies when you’re on your way to class.

Reena Tan, a first-year social sciences student, says: “I’m usually near the South Spine so it’s easy for me to get hot water from the nearby canteen or The Hive. Aside from the convenience, I use my own instant coffee because I can get that nice aroma that you can’t find in coffee sold on campus. I really like the fragrance of Nescafe Hazelnut.”

TIP: While waiting for the lift, save time by making your instant coffee at the hot water dispensers found near the lift lobbies.

Those up for a stronger kick may find their favourite in kopi, with condensed milk and sugar stirred in. It is brewed with Robusta beans, which pack twice as much caffeine than in Arabica beans. The kopi at the North Spine Food Court is popular among students for its golden proportion of coffee, milk and sugar.

“They’re roasted for too long. It’s burnt because the beans sold on campus tastes too acidic and has the right sweetness,” says NTU food scientist Prof William Chen. “Caffeine has been shown to have antioxidant properties, which may be reflected in skin protection against free radicals from sunlight.”

What can you do with used coffee grounds?

1. Exfoliate your skin
   Add a bit of coconut oil or water to used coffee grounds to make a facial scrub that can gently massage your face with. The caffeine in it could also protect your skin from sun damage. NTU food scientist Prof William Chen explains: “Caffeine has been shown to have antioxidant properties, which may be reflected in skin protection against free radicals from sunlight.”

2. Tenderise meat
   Add spent coffee grounds to your favourite dry-rub recipe. Coat the meat two hours before cooking it and let enzymes do the rest. These enzymes, called proteases, break down the proteins found in muscle fibres and connective tissue in meat, thus making it tender, says Prof Chen.

3. Neutralise odours
   A bowl of coffee grounds placed in the fridge or freezer can help to absorb and eliminate odours, thanks to the combination of nitrogen and carbon found in the grounds, says Prof Chen. You can even rub them into your hands after chopping garlic to keep your hands smelling fresh.

HEY! STUDENT WRITER

Annmarie loves watching old movies and plays and would catch every musical out there if she had the money for it. She hopes to live life joyfully and to understand people better.
How is the science of sound used in movies?
Most of us have a very similar response to certain sounds. We tend to find the sound of rain pleasant and calming, while the sound of nails on a chalkboard might make us cringe. These common associations are often used in movies to elicit certain reactions in audiences. For example, the sound of a child crying or in distress has a similar alarming effect on most of us, and so you may hear it in a horror movie.

What types of sounds do you hear the most?
The sound of the television while I’m working out at the gym drives me nuts. I don’t mind piped music or even the “oomf” or “aggg” sounds made by people working out around me. Just not the drone of the

Why do some sounds that my friends love seem to irritate me so much?
Your response to a sound depends on the nature of that sound and the context in which you hear it. What is acceptable to you depends on your previous experiences. My dad hated the sound of people chewing their food, so I grew up in an environment where I didn’t hear or make any eating noises. It bugs me now when I hear loud chewing.

Why do I get goose bumps when I hear a particular song?
Music can create a wide range of physiological effects in us. Other than goose bumps, you can get a tingle down your spine. You can also suddenly feel very sad or even the “oomf” or “aggg” sounds made by people working out around me. Just not the drone of the

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“Who says university is all work and no play?”

Sean Lim
Medicine
Head of school sports club
Singapore representative in an international medical student conference
Volunteer at community health events and children’s autism centre

HEY! It’s NTU