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A QUARTERLY PUBLICATION OF
NUS National University of Singapore | Enterprise

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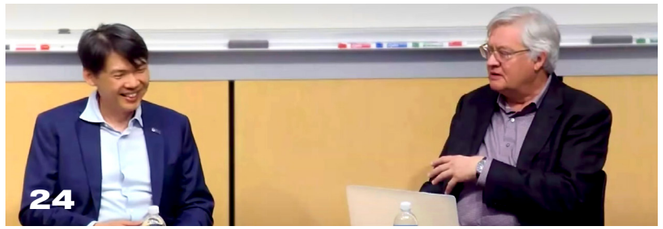
The future is green: **breakthrough technologies behind smarter buildings and cleaner waters**

ISSUE #46 JUL – SEP 2025



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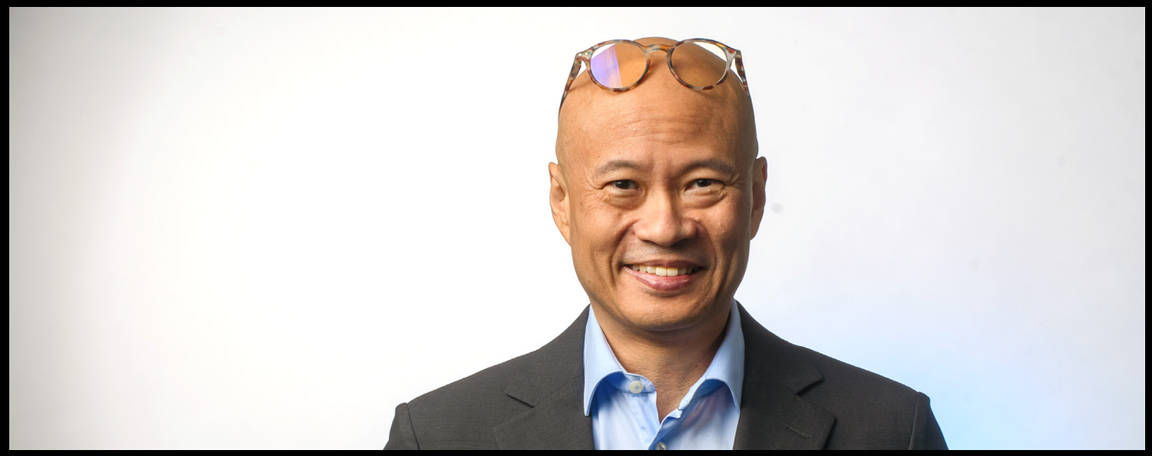
FROM THE SENIOR VICE PRESIDENT (INNOVATION AND ENTERPRISE)



Innovation isn't about following trends. It's about creating them.

Entrepreneurs don't wait for permission to solve the world's biggest challenges. Louis Chan left pharmacy to revolutionise air conditioning with Greenbix. Clear Robotics refused to accept polluted waters as inevitable. Urbanflow is redefining the design processes behind sustainable cities with AI urban and building intelligence, while Japan's AquaAge takes innovation to new heights with air mobility.

From impact investor Joe Rouse's insights on the cost of inaction to Professor Abhik Roychoudhury's insights behind the founding to acquisition of his AI start-up within 10 months, these stories share one truth: uncertainty isn't a barrier—it's an invitation to create something transformative.

Our NUS Enterprise teams have just moved into the newly revitalised i^3 building—we are on the precipice of our next transformation too.

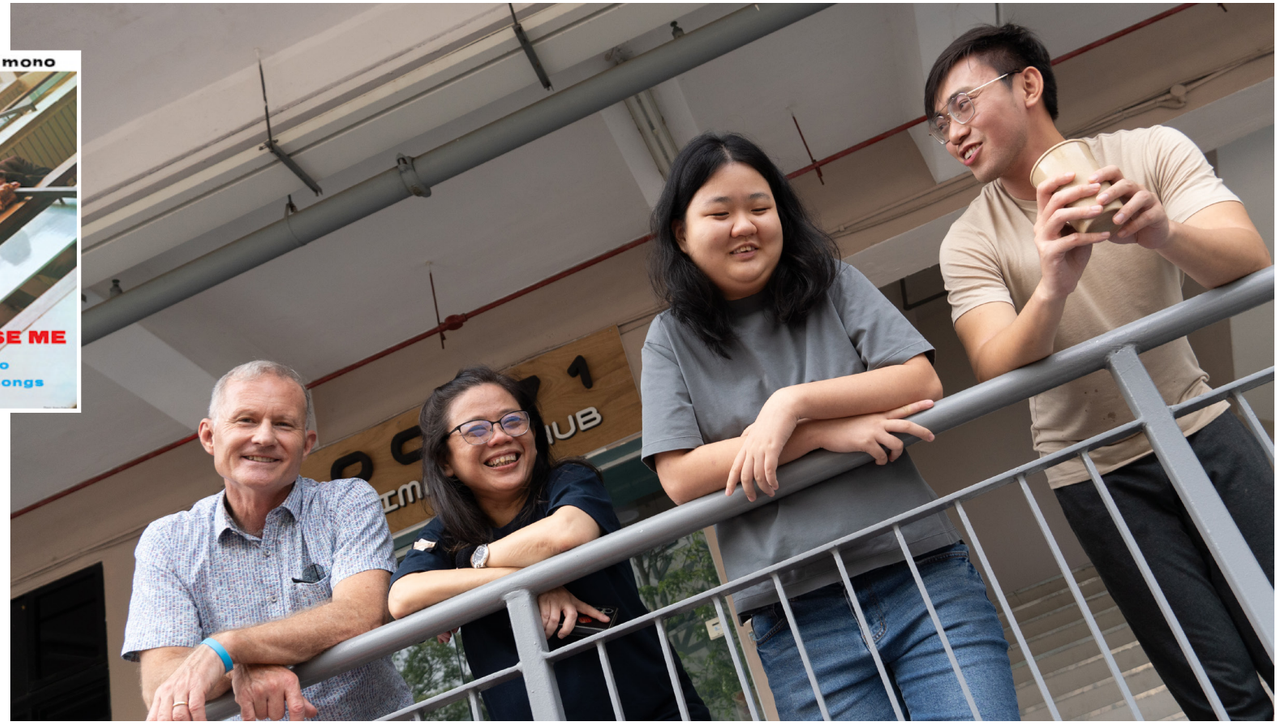
The next breakthrough is waiting. Let's make it happen.

DR TAN SIAN WEE

Never just… build

It’s been 16 years and counting

That’s how long **Joe Rouse** has been mentoring entrepreneurs participating in NUS Enterprise’s initiatives. In this role, he guides start-ups strategically, helping them validate product-market fit, translate and protect intellectual property, and raise capital. His designation – Ambassador-at-Large, Start-ups Community, NUS Enterprise – reflects his broad purview to connect expertise, funds, ideas and people within and beyond Singapore, through to NUS Enterprise’s vibrant start-up ecosystem.



LEFT TO RIGHT:
Joe Rouse with **Ho Yuen Ping**, Senior Associate Director, Ecosystem Development, **Darice Wong**, Executive, Ecosystem Development, and **Qi Herng Kong,** Co-founder of social enterprise, **Moonbeam.co**. The group photo was inspired the Beatles' debut studio album Please Please Me.

Album cover credit

Joe often meets his mentees and conducts sharing sessions at the BLOCK71 Social Impact Hub launched by NUS Enterprise. The Hub is a dedicated space designed to empower purpose-driven ventures and amplify their impact.

This ecosystem is plugged into the world, with BLOCK71's presence in 11 cities. Entrepreneurs can tap into the network of physical accelerators to access critical resources, structured support, mentorship and international markets. BLOCK71, as well as NUS Overseas Colleges, and National GRIP (its predecessor being Lean LaunchPad Singapore) , are NUS Enterprise's signature programmes, and Joe has mentored participants and contributed workshops, discussions and activities behind each of these. He now focuses much of his efforts on social impact, including as a mentor in the Technology for Sustainable Social Impact (TS2) Start-up Accelerator programme.

investment communities. He went on to establish a 20-year career in venture capital and business advisory.

That NUS Enterprise has brought Joe onboard its programmes for years is testament to his rich experiences and relevant skillsets. His mentees, too, recognise the immense value he brings, so much so that a few of them have made personal arrangements to continue 'strategic mentoring check-ins' long after their contractual periods have come to an end. During this interview, Joe mentions that later in the week, he would be communicating with someone he first mentored as a start-up founder 10 years ago. Today, that person runs a

"I can come across as driven and demanding, but I believe I am also compassionate."

Joe has worked with start-ups across sectors spanning automotive, civil aviation, enterprise internet of things (IoT), ports and shipping, pharmaceuticals, and social impact. Some of them have grown into household names. Notably, he had approved Carousell's first grant from NUS and mentored Patsnap – both NUS-grown unicorns. He also mentored Go!Mama, and is currently a mentor in the second run of the TS2 Start-up Accelerator, having worked with FingerDance and MADCash in the first run.

Behind his practice of mentoring

Being actively involved in the start-up community is something the long-time mentor finds deeply fulfilling. "It gives me purpose and a sense of contribution back to a community that has given me so much." That purpose stems, in no small part, from gratitude. His early successes in founding and scaling three start-ups – one went public in Canada, another was acquired by a NASDAQ-100 company – significantly altered his financial and personal trajectories, including his first engagement with the Singapore and Southeast Asian innovation and family investment fund in India, focused on early-stage investment. "In that sense, he's now my peer," Joe quips, with a degree of pride. Another mentee, from five years ago, also connects with Joe regularly. "We go for a walk and have a meal every quarter or so, just to talk about things."

When asked about the 'uniquely Joe' traits that continue to draw former mentees, he insists that NUS Enterprise had worked with many diverse, capable stable of mentors over his time, before making an attempt to detail his own attributes. He admits to having a "healthy sense of urgency", but it is only because "there is a cost to doing nothing" – a message he readily conveys to his mentees. He guides his charges holistically, encouraging them to make time for family, friendships, and fitness, so they can build resilience and a support network outside of their ventures.

Circling towards clarity

Joe is a firm believer of the lean start-up mantra of 'Build, Measure, Learn', with listening to the customers as a central component. This virtuous cycle of build-

measure-learn (repeat) helps companies achieve and maintain product-market fit, and drive business growth.

Joe points to Carousell, whose founders built around the everyday frustrations of selling pre-loved items to NUS students on their platform. The team launched during the very early days of e-commerce in Singapore, when few people trusted buying, and especially transferring funds, online. Carousell's focus on the needs of the local market – while noting how and what the more developed e-commerce platforms overseas were doing – and their translation of those observations into a compelling platform, gave them the edge. Their 'active listening' of customers' voices also attracted quality early-stage and expansion-stage investors to support Carousell's growth.

More recently, Joe mentored the co-founder of Go!Mama. The company provides 'smart', secure and hygienic pods for breastfeeding mothers in Singapore, and an online platform for related information, products and services. The co-founder already had a strong background in business development and account management in the healthcare space, but Joe was struck by her keen understanding of the diversity of stakeholders in the Go!Mama community, and the value in engaging them in a 'national dialogue' about breastfeeding mothers' value to the country. "She identified and reached out to NGOs, government, GLCs, and MNCs, helping them understand the alignment between the needs of breastfeeding moms and their own business objectives, beyond CSR."[1]

Who are you in the Beatles?

The romanticism associated with the start-up hustle – everyone wearing multiple hats, crazy hours, mad dash towards product launch – is familiar to Joe, but he cautions against glorifying the chaos. Instead, his advice is for start-ups to put in place a formalised structure early, with clearly defined roles and leadership. "Passion is great, but you still need everyone to come together to form a balanced team, where all the main functions are covered," he states firmly.

The corporate framework does not have to be rigid, but someone must carry the flag. "This should be the founding CEO, who's empowered to say 'yes' or 'no', as the case may be." The rest of the team, confident that they have a reliable leader they can trust to take care of things, can then concentrate on their own domains. "To foster this – and I know I'm showing my age by the example – I ask my teams, 'Who are you in the Beatles?' But they understand the analogy that all must play their instruments well and in harmony with their bandmates, to an audience, while following the band leader's direction."

Without strong, outward-facing leadership, teams often default to the tech and internally-driven product development, which is "dangerous", according to the seasoned mentor. And, as important as tech and product are, vital operating functions like sales, marketing and finance should also be staffed with "switched-on, driven people", advises Joe.

"Listening is how you discover what issues they have, and what solutions they need, which you then provide. Thereafter, listening serves as a constant validation that the solutions are sound and remain so, and customers are willing to pay for them."

Brace for the 'tornado'

Start-ups are built and resourced to chase success. Yet, when a product finally finds traction and the orders skyrocket, many founders are blindsided, because they are not prepared for this inflexion point. "It's going to feel like a tornado hit, because everything will require immediate attention from everyone," describes Joe. Without the company infrastructure (operations, finance, marketing and sales) to scale, there is a high chance that the demands will lead to extreme busyness, burnout or even failure.

Scaling is an area of risk because it requires so much in terms of resources, but Joe's experiences affirm it as an area of "great reward" personally and, for businesses, scaling is "mandatory", especially if there are outside investors.

Joe's recent mentee, FingerDance, an AI-based start-up that has completed the TS2 Start-up Accelerator and NUS GRIP, recently shifted its focus to scaling. FingerDance helps to transcend communication barriers between the hearing and the deaf with its kiosk-based, two-way sign language translation system, SiLViA. After a successful trial at Chinatown MRT station, it is presently planning to locate more kiosks at additional MRT stations operated by SBS Transit across Singapore.

From product development through to implementation, the team had worked closely with the market, including the Singapore Association for the Deaf, and SBS Transit, to get the product right. The start-up founder is also learning Singapore Sign Language, so he can 'listen' to the deaf community. "Building enduring partnerships is essential; it is a source of competitive advantage and a key factor when scaling," explains Joe.

[1] NGOs: non-government organisations; GLCs: government-linked companies; MNCs: multinational corporations; CSR: corporate social responsibility

"Always keep in mind, someone must go out to talk to the customers, and help the product team translate that into something of value that customers will buy and refer on to others."

RIGHT TO LEFT: **Nina Othman**, MADCash State Leader for Sabah and co-founder, By Borneo, **Nuraizah Shamsul Baharin**, MADCash CEO, and **Joe Rouse**.

Clock out, don't burn out

A start-up founder's life can be all-consuming, with 60-plus-hour work weeks, little sleep, non-stop pressure … until personal health takes a hit. This is where Joe steps in with something unexpected – the permission to stop. "I help them reclaim their time. I remind them that yes, the business needs to run, but not at the expense of their physical or mental health." Not only the founders, the whole team needs regular time-out as well. He encourages scheduling group 'playtime' during periods of extended hours, for the team to come together in a relaxed setting. "It relieves the pressure, gives them time to recharge, and hopefully, see the forest for the trees," Joe adds.

BELOW: **Gong He**, co-founder of FingerDance, and **Joe Rouse** enjoying a Szechuan lunch after their mentoring session.

For entrepreneurs carrying the weight of the business on their shoulders, the mentor recommends having a strong social support network, be it a life partner, a circle of friends, a community or an organisation. Crucially, it has to be outside the business, to provide the needed balance and distance. Joe himself stays connected with his immediate-past TS2 mentees in a WhatsApp chat group. "There are six of us at the moment. We share ideas, celebrate personal milestones and arrange meet-ups, over meals where possible. It's very informal, but it keeps us grounded," he discloses.

A founder's journey is often long and arduous. To avert burnout, Joe tries to institute a 'mindset change' among his mentees. He wants them to know that clocking out is not copping out; instead, it fosters the strength, flexibility and stamina they need to go the distance. As such, he urges the overworked innovators to embrace every temporary interlude. "Downtime is productive time. Take a break. Drink deeply from that well. Come back stronger!"

The Clearbot team testing the second prototype (Framebot) in the waters.

The promise of clear waters

The promise of clear waters is expanding with **Clear Robotics**, an innovative marine-tech company deploying autonomous robot boats to transform polluted waterways into clean ecosystems.

Developed by **Clear Robotics**, the solar-powered Clearbot uses advanced robotics and AI to collect and analyse waste from diverse locations like India's Umiam Lake and Hong Kong's waterways. This technology offers a scalable solution to the massive global plastic pollution crisis in our oceans, while also laying the groundwork for a future of versatile unmanned maritime operations that extend far beyond waste collection.

The vessel glides efficiently across Umiam Lake in Meghalaya, India, smoothly scooping up trash with an onboard conveyor belt system. There's no operator onboard because the Clearbot is designed for autonomous operation, enhancing safety by eliminating the need for human presence in potentially hazardous environments.

This multifunctional, autonomous workboat was developed to tackle marine pollution and perform various water-based tasks. The boat is self-navigating and operates autonomously through a combination of advanced robotics and artificial intelligence.

While Umiam Lake's waters are now visibly cleaner, it's worth remembering that a staggering 41 tonnes of waste had once choked its ecosystem. The transformation is a testament to the Clearbot's effectiveness.

A global pollution crisis in numbers

Growing up in India, Clear Robotics' Co-founder and CEO, Sidhant Gupta was drawn to robotics at a young age. "I have seen how humans working in dangerous places can get injured. I really believe that robotics can change the way we do things – for the better."

Clear Robotics began as a student project before evolving into a full-fledged company. While visiting Bali, Sidhant and his co-founder, Utkarsh, encountered massive pollution in its waterways. This prompted the group to build a prototype robot to clean up the waters.

"We built this very scrappy prototype that ran on electricity: using two toy helicopters motors, four aluminium bars, and spare netting from a fishing vessel. It was the start to greater things to come. We saw a sustainable business and we saw the environmental problem, so we decided to do this full time." Sidhant shared.

Without additional policy action, the OECD estimates that the amount of plastics accumulating in the ocean is projected to reach 76 million tonnes by 2040 and 141 million tonnes by 2060. This means that in just two decades, the quantity of plastics in the ocean will match all historically accumulated plastics up to now.

If no action is taken, by 2050, plastic in our oceans is expected to outweigh all the fish by mass.

How the Clearbot works

"Since developing the initial prototype, Framebot, in 2019, Clear Robotics has advanced its technology significantly. The Clearbot fleet now includes various sizes, not just a single class. These vessels are fully electric and emissions-free, powered by batteries charged by solar panels."

Each Clearbot uses features like autonomous waypoint mission paths, failsafe return-to-home capabilities, and anti-collision software that detects objects within a 13-metre (45-foot) radius. It can be set to run autonomously or be guided by a remote operator.

"Clearbots operate using pre-set routes (like a Roomba for water), with object avoidance algorithms using sensors like LiDAR and GPS to navigate and avoid obstacles," explains Samyuktha Sriram, Clearbot's Head of Business Development and Marketing.

"Multiple cameras on the vessel photograph every object collected, recording the image along with its GPS location, and categorising it. This data is transmitted to an AI-powered dashboard, allowing clients to monitor trends,

identify pollution leakage points, and make informed decisions about waste management."

All data can be transmitted over the internet, allowing Clear Robotics' customers to keep manpower requirements and fuel costs low, and swiftly deploy remote-controlled vessels to do necessary tasks.

This expanding capability is central to Clear Robotics' vision of becoming a comprehensive unmanned maritime solutions provider.

Cleaning Meghalaya: A scalable model for real impact

Clear Robotics' first major deployment took place in Meghalaya, in partnership with the Smart Village Movement, a nonprofit dedicated to sustainable rural development.

Meghalaya's rivers and lakes, including the Umiam Lake, a famous tourist site, have experienced years of waste accumulation due to overflowing landfills and river pollution. Local fishermen, once despairing over the lake's decline, now watch as Clearbot tirelessly clears the waters.

"In just three months, we removed 15 tons of waste from Umiam Lake. When deployed, our Clearbot collected about 200 to 250 kilograms of waste daily. In some sessions, the vessel collected up to 200 kilograms of waste per hour, demonstrating consistent, and efficient high-volume cleanup capacity," Sidhant says.

Clear Robotics' primary clients are government bodies and port authorities responsible for managing waterways. Samyuktha adds, "We usually work with local partners who then help us process the waste collected. Sometimes we're able to convert the waste into pellets and create something reuseable."

The team is united by the shared mission to clean up our waters, and reduce the probability of humans having to work in dangerous conditions. "Everyone in the company, and whoever that is working with us, is doing it for the mission as much as anything else." Samyuktha shares.

Mission-driven and market-ready: #Winning with PIER71™

In 2024, Clear Robotics participated in the Smart Port Challenge organised by PIER71 and won. Founded by the Maritime and Port Authority of Singapore (MPA) and the National University of Singapore (NUS), PIER71 designs and delivers programmes to supports marine-tech entrepreneurs from ideation to acceleration of their ventures.

"The programme significantly helped us with networking in Singapore, connecting us to clients we are pursuing today. In our experience of this business, we have never moved so quickly in the three months spent. The Smart Port Challenge is definitely one of the best programs we have ever done because you'll get outsized returns and a real place to build your business," Sidhant said.

With their successful deployment in Meghalaya, Clear Robotics is just getting started.

"Our vision is to be the largest unmanned boat and ship operator in the world. I have no doubt we can achieve it one day."

ABOVE:
Smart Port Challenge 2024 Winner Clear Robotics' Co-founder and CEO, **Sidhant Gupta** (6th from left) on stage together with other winning teams (Open Ocean Robotics and GT Wings), after receiving their prizes from Guest-of-Honour **Dr Amy Khor**, then Senior Minister of State, Ministry of Transport, Singapore and Ministry of Sustainability and the Environment, Singapore.

> "We would like to give a huge thank you to the entire PIER71 team for putting together such a valuable programme, helping us land in Singapore and grow our business from here."
> **– Sidhant Gupta**

Find out about **Smart Port Challenge 2025**

"We started Clear Robotics to remove trash from the water, but our mission has grown since. Now, our Clearbots can do so much more—cleaning waterways, measuring water quality, surveying hard-to-reach areas, and even delivering goods to remote locations,"

– Sidhant Gupta shares with pride

Clear Robotics partnered with Razer to design the Clearbot Neo. This collaboration brought about significant improvements to the Clearbot's design, making it more durable.

2025 Scaling and first operations in Singapore, Philippines, Thailand, Malaysia

2024 Won PIER71's annual Smart Port Challenge

2023 Expanded operations in India; first major deployment in Meghalaya, India

2022 Achieved fleet expansion to 13 boats operating in Hong Kong and India; Secured US$4 million valuation in a seed funding round with investors including Alibaba Entrepreneurs Fund, Gobi Partners, and CarbonX Global

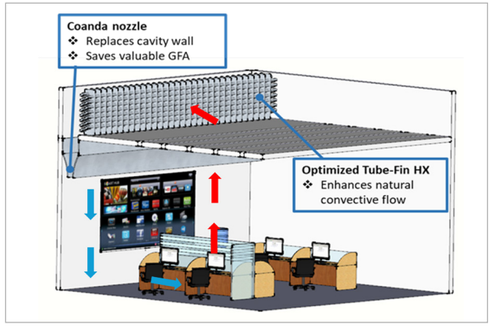
2020 Developed ClearBot Neo, a solar-powered, AI-enabled autonomous robotic boat capable of collecting up to 1 metric ton of trash per day

2019 Founded as a student project focused on automating marine waste collection after noticing pollution issues in Bali

TOP:
Deployed Clearbot at the Umiam Lake as part of the Smart Village Movement.

The future of air conditioning is green, says pharmacist turned entrepreneur **Louis Chan**

Drawing inspiration from Italy's innovative green initiatives, CEO and Co-founder of **Greenbix Louis Chan** is revving up his drive to cutting energy use and carbon emissions with breakthrough HVAC technology—making sustainable comfort a reality for buildings of today and tomorrow.



TOP: Greenbix's air-cooling system provides a cost-effective way to cool your building, without the fan and air distribution duct setup. It's 30% faster in cooling and 50% smaller in size compared to conventional air-cooling systems.

"An HVAC system is what keeps your indoor environment comfortable by controlling the temperature, humidity, and air quality. For someone who enjoys their aircon (like me), think of HVAC as the whole setup that not only cools the air but also circulates the fresh air and removes stale air, making our indoor environment feel pleasant and conducive."

Louis Chan had just returned from a trip to Italy. He shares with delightful enthusiasm how Italy is tackling climate change. Lombardy and Tuscany are pushing forward with agrivoltaics, blending solar panels with farmland – the Italians have wisely used their 7,000-year-old agricultural industry as a lever to drive widespread adoption and acceptance of green technology.

"Witnessing this approach reflected not just in policy, but in everyday life shifted something in me. I was convinced that we can still have our comforts while significantly reducing our environmental footprint."

Italy now generates nearly half its electricity from renewables, surpassing the global average. In contrast, Singapore still relies on natural gas for at least 95% of its electricity. The central question remains: how can Singapore achieve a similar transformation?

"Sustainability was a calling."

Educated and trained in pharmacy, Louis swapped his lab coats for suits when he found himself leaning more comfortably into the world of sustainability while working as an intern at Deloitte. To him, sustainability is a space that embraces innovations of all forms, respects accountability, and, most importantly, is impact-driven.

Today, he is a certified ESG Analyst and co-founder of Greenbix, a deep-tech start-up that has developed a patented passive displacement coil technology aimed at dramatically cutting electricity use by HVAC (Heating, Ventilation, and Air Conditioning) systems —making them more energy-efficient and sustainable.

Greenbix's co-founders, Guo Shuai and Kai Xian Cheng, both hold PhDs in mechanical engineering, providing strong technical expertise for product development and continuous improvement of their HVAC solutions.

Our beloved air-conditioning is costing us more

In Singapore's tropical climate, HVAC systems are essential because they cool and dehumidify the air, ensuring you stay comfortable indoors despite the hot weather outside.

However, air-conditioning is expensive and damaging to the earth. In Singapore, air conditioning and mechanical ventilation (ACMV) systems account for more than 50% of a building's total energy consumption, with cooling alone responsible for around 60% of electricity use in non-residential buildings.

Since Singapore's carbon tax introduction in 2019—currently $25 per tonne of greenhouse gas emissions, rising to $45 by 2026, and projected to reach $50–80 per tonne by 2030—delaying energy-efficient upgrades is increasingly costly for businesses.

Taking the air-con apart

Greenbix's innovative air-cooling system takes a bold, new approach to using less energy – by removing the air handling unit (also known as the fan) and air distribution duct, core components of conventional HVAC systems.

Guo Shuai, Chief Technology Officer, Greenbix, participating in the innovation showcase and Tech Pitch Battle at InnovFest Suzhou 2024.

Greenbix's founding team at an NUS GRIP workshop session to delve into market sizing and competitive analysis, in 2024. From right: **Louis Chan**, **Kai Xian Cheng** and **Guo Shuai**.

Advice from one entrepreneur to another:

"Our biggest 'life hack' is maintaining adaptability and a strong bias toward action. Too often, people get stuck in the planning phase—endlessly strategising without execution. I believe it's far more valuable to act: send that email, reach out to that potential partner, or test that new idea.

If it doesn't work, you learn quickly and can pivot just as fast. In the start-up world, speed and adaptability are your biggest assets. The faster you can test, learn, and iterate, the better your chances of staying ahead in a rapidly changing market."

– Louis Chan

The system uses a passive displacement cooling (PDC) approach, leveraging natural air movement. Greenbix's solution cools indoor spaces 30% faster and is 50% more compact than conventional PDC systems.

"Inside each unit, chilled water pipes cool the air, which, being denser, sinks and spreads across the room. As the air warms, it rises and is recirculated for cooling, creating a convection current that eliminates the need for energy-hungry fans. This results in substantial energy savings and a quieter environment."

"It became apparent to us that the fan was a major contributor to energy consumption. This inspired us to rethink the entire system. We then engineered a far more efficient passive displacement cooling coil, optimising tube design and structure to outperform existing market options, both in speed and effectiveness."

Greening buildings in Singapore – starting with the Heeren

For building owners and operators, Greenbix's solution translates into significant cost savings on utility bills, more operational space, and reduced exposure to rising carbon taxes.

The start-up's innovative air-cooling system is already implemented at the Heeren in Singapore, which is certified BCA Green Mark Platinum, the highest rating in the BCA's green building rating system. "Based on the findings from our trials at The Heeren, we have calculated a savings of over $100,000 over a projected 15 years lifespan of HVAC system due to the energy savings. Even though the capital cost of our system is higher, significant cost savings come from the calculated energy saved by using our system."

Scaling up on impact with NUS GRIP

By lowering HVAC energy consumption, Greenbix also helps building owners meet the Singapore Green Plan 2030 targets, contributing to national sustainability goals and reducing global greenhouse gas emissions. "Achieving international green building certifications such as LEED Platinum also enhances a building's marketability and supports higher occupancy rates, as tenants increasingly seek out sustainable, cost-efficient spaces." Louis adds.

Since joining GRIP (NUS Graduate Research Innovation Programme) in 2024, Greenbix has secured funding and is now focused on growing its client base and deepening its market presence in Singapore and the Southeast Asian region next.

"GRIP equipped us with the business acumen and strategic frameworks necessary to transform our technology into a commercially viable venture—opening doors to key industry stakeholders and helping us refine our go-to-market strategy. NUS Enterprise also regularly shares relevant start-up events, which helped us stay plugged into the entrepreneurial ecosystem."

What's next for Greenbix?

Greenbix is seeking partnerships for product integration, pilot projects, and research collaborations to enhance its offerings. The company has filed patents in Singapore, Japan, and China, and is preparing for a fundraising round to support regional expansion and cement its position as a leader in sustainable HVAC innovation.

Learn more about **Greenbix** and the **National GRIP** initiative launched by the National Research Foundation (NRF) and executed in partnership with NUS and NTU.

2025
- Presented at GRIP Lift-Off Day
- Seed stage

2024
- Incorporated in H2 2024
- Shortlisted for InnovFest Suzhou 2024 to increase Greenbix's exposure.
- Presented at NUS Cities Event where key stakeholders such as the Minister of Sustainability and Environment was present
- Successfully completed GRIP which led to S$250,000 of convertible note by GRIP Investment Committee
- Pre-seed stage

2023
- Team officially came together at the end of 2023Presented at NUS Cities Event where key stakeholders such as the Minister of Sustainability and Environment was present
- Pre-seed stage

2022 Technology development as part of Guo Shuai's PhD project

"One standout individual we are particularly grateful for is **JD**, our assigned venture architect from NUS Enterprise. Drawing from his experience as a serial entrepreneur, JD provided us with pragmatic advice at critical junctures—whether it was stakeholder engagement, business model refinement, or navigating early-stage challenges.

His mentorship has been instrumental in helping us avoid common pitfalls and accelerate our growth trajectory. Having someone who genuinely understands the founder's journey and can offer actionable insights has made a significant impact on Greenbix's ability to scale effectively."

– Louis Chan

Making collaboration in sustainable urban design a reality

In Singapore, we spend most of our lives in buildings. When outdoors, we navigate through our cityscape, and the sights and sounds of our neighbourhoods with ease. But behind executing a well-thought-out urban and building design lie inefficiencies and fragmented workflows that often lead to construction delays and disputes.

Deep-tech start-up **Urbanflow.co** aims to streamline the traditionally gruelling design process behind sustainable buildings and cities, making it more seamless and efficient.

As Singapore races to green 80% of its buildings by 2030 under its ambitious Green Building Masterplan, the challenge is not just in meeting the target — it's about transforming how buildings in our city-state are designed, built, and operated sustainably. As new buildings get smarter and greener, integrating sustainability and optimising operational performance have become even more important considerations when in the initial stage of building design.

Having encountered inefficiencies in urban and building design, and the building delivery process, Yu Qian Ang, Bryan Ong and Ryan Tan decided to come together to develop Urbanflow, a collaborative, AI-driven urban and building design platform that empowers architects and planners to meet these bold green building goals with unprecedented speed and precision.

Urbanflow's Co-founder Yu Qian shares, "All of us have an affiliation to the built environment of sorts. I did my PhD in Building Technology, Ryan built the Singapore Carbon Calculator, and Bryan is at GovTech Open Government Products working on tech for public good. It made sense for us to come together and develop a platform that can help make designing sustainable buildings and cities more seamless and efficient."

Urbanflow is backed by NUS GRIP (Graduate Research Innovation Programme), and is also in the Microsoft for Startups and NVIDIA Inception Programme. The platform is not yet available to the public , but interested parties can join the waitlist.

Breaking down the silos

The Architecture, Engineering, and Construction (AEC) industry suffers from fragmented workflows where design teams work in silos using disconnected tools, making it difficult to integrate sustainability considerations, collaboration, and performance analysis from the earliest stages of projects, leading to costly changes, missed targets, and suboptimal building outcomes.

Urbanflow is designed with the primary objective of breaking down silos between

architects, engineers, planners, and developers by providing a unified platform for real-time design collaboration and energy analysis – all powered by AI.

How Urbanflow works

"Urbanflow is like having a team of AI building experts working together in real-time to optimise your designs. Instead of running time-consuming simulations, we have trained specialised AI 'surrogate models' - each an expert in different building performance areas like energy consumption, cost estimating, carbon accounting etc," Yu Qian explains.

When a team member creates or modifies a building design, the AI models instantly analyse it simultaneously, drawing from thousands of pre-computed simulations they learnt in training.

He adds, "The models can synchronise in real-time - for example, when the energy AI suggests better window placement, the daylight AI immediately shows how that affects natural lighting while the airflow AI updates ventilation predictions.

This collaborative network of specialised AIs gives you instant, scientifically backed feedback on multiple performance aspects as you design, transforming what used to take hours of separate simulations into seconds of integrated analysis, enabling you to create better, more sustainable buildings faster."

Changing how Singapore's construction industry had worked – for decades

That Urbanflow focuses on early-stage collaborative design optimisation, rather than detailed post-design analysis is a game-changer. This enables designers to take the latest construction and green building regulations into better consideration and addresses the industry's most pressing need: making sustainability decisions when they have maximum impact and minimum cost.

"Our AI models are built on peer-reviewed algorithms and validated simulation methods developed through NUS research to ensure scientific accuracy. This combination of academic rigor, real-time collaborative capabilities, and early-stage focus creates a unique value proposition that Urbanflow has, changing the way the industry works, fundamentally. We want to transform how teams approach sustainable design from the very first sketch, rather than treating performance analysis as an afterthought."

From academics to industry practitioners

Already Urbanflow is seeing results. "Our research group, City Syntax Lab that spun off Urbanflow works with planning and built environment agencies and companies across Singapore. NVIDIA also supported us with their top-tier GPUs, which helped us building our models, contributing to us setting up Urbanflow.

Urbanflow is designed for architecture and design firms working on commercial, institutional, and multi-family residential projects, particularly those committed to sustainable design and green building certifications. "We also serve engineering consultancies, building performance specialists, property developers focused on ESG goals, urban planning agencies working on district-level sustainability initiatives, and educational institutions teaching sustainable design."

To effectively utilise Urbanflow, businesses should be engaged in projects beyond single-family residential scale, be comfortable with cloud-based collaborative platforms, and committed to sustainability outcomes or green building goals. "Though, Urbanflow is expanding to include the residential market too," Yu Qian was quick to add.

Navigating the NUS start-up ecosystem

NUS provides world-class programmes and funding opportunities that match the calibre of elite US institutions such as MIT and Harvard, where Yu Qian was once based. "The challenge lies in navigating the substantial red tape, paperwork, and bureaucracy — which can be ten times more complex than at institutions like MIT or Harvard. And thus, the challenge lies in navigating substantially more administrative complexity and bureaucratic layers."

He notes that for software companies like Urbanflow, the personnel costs should be the primary expense, with minimal overhead elsewhere.

"Our challenge isn't rising business costs – it's navigating the administrative burden and paperwork. Just to start the company, I needed approvals from the whole world and had to complete over 10 different forms. Some days, I spend most of my time on administrative tasks and filling out endless forms instead of actually conducting research or building the company."

"It's about solving real problems, not just implementing AI for its own sake."

Looking ahead: is AI really delivering on its promise?

Yu Qian offers a candid perspective: "While AI is undoubtedly transformative for urban design and sustainability, I believe it's overhyped right now, and many VCs will likely not see the returns they're expecting. The key is looking beyond the buzzwords and focusing on metrics that actually matter - whether the technology delivers genuine positive value and ROI for users (we are working on that too).

In Yu Qian's view, AI's true potential in this field lies in addressing specific, measurable challenges, such as accelerating design iterations, improving building performance predictions, or optimising resource allocation. "It's about solving real problems, not just implementing AI for its own sake," he emphasised.

Advice from one entrepreneur to another:

"The global start-up and venture world moves very quickly and wait for no one. If there's something you need to do, just get it done and worry about other things later. As long as it does not violate moral, ethical, legal, or regulatory boundaries, of course."

– Yu Qian

Find out more about **Urbanflow** and the **National GRIP programme**.

LEFT: Urbanflow's Co-founder **Yu Qian Ang** pitching to investors and industry partners at GRIP Lift Off Day held on 14 April 2025.

TOP: The co-founders of UrbanFlow all had an affiliation with the built environment. **Yu Qian** has a PhD in Building Technology, **Ryan** built the Singapore Carbon Calculator, and **Bryan** is at GovTech Open Government Products working on tech for public good.

2025
- Partnership with Solemma LLC, a Harvard/MIT spin-off, as the exclusive partner for ClimateStudio in Singapore, and partner for China and SEA
- Launched beta versions
- Pre-seed

2024
- Completed NUS GRIP with investment secured
- Accepted in NVIDIA Inception Program for start-ups
- Involved with GRIP
- Pre-seed

Jerry Wang and **Chih Hong** have been amazing partners for us in our journey in the **DeGap funding** and **NUS GRIP**. They understand the fluid, fast-paced nature of early-stage start-ups and tried to assist where possible.

Building Southeast Asia's start-up ecosystem: Insights from Dr. Benjamin Tee

Speaking this year at Stanford University's US-Asia Technology Management Centre, his alma mater, Dr. Tee sat down with US-ATMC Director and VC investor Dr. Richard B. Dasher to share his perspectives on building the start-up ecosystem in Singapore anad Southeast Asia, and lessons learnt for others looking to walk down the path of entrepreneurship.

In the fast-paced global innovation ecosystem, Southeast Asia has emerged as a formidable force. At the heart of this transformation is Singapore, a country that has redefined itself from a trading port into a global innovation hub.

Growing up in the thick of this economic transition is serial entrepreneur and Vice President of Ecosystem Building at NUS Enterprise, **Dr. Benjamin Tee** is also Associate Professor of Materials Science and Engineering at the National University of Singapore (NUS).

From Researcher to Serial Entrepreneur

Dr. Tee isn't the typical researcher. Starting off as a PhD student at Stanford, he soon realised that publishing scientific papers was not enough. True innovation meant translating research into real-world products.

"I really wanted to bring products to market that people actually use," Dr. Tee reflected, describing his decision to join the Singapore-Stanford Biodesign Fellowship, a programme that emphasised solving real problems rather than just developing technology for technology's sake.

This approach paid off. His first start-up, born from this fellowship, was acquired after five years. "Given the state of the ecosystem back then in Singapore, it took me almost a year to get a first angel investment," he recalled. But with each subsequent venture, the process became faster and more robust, a testament to the growing ecosystem. His second company, a Y Combinator-backed venture, secured its first cheque from an angel investor in less than a week and operates in six countries with over $10 million raised.

"Singapore is like a start-up"

Dr. Tee's personal narrative mirrors the broader trajectory of Singapore's start-up ecosystem. Once a nation with limited resources, Singapore has invested heavily in developing its innovation capacity. "We do not have any natural resources; we have only talent. What we have going for us is the ability to invest—and over the years, we have built out a reputation for hosting some of these assets and capital."

A key turning point was the government's strategic focus on nurturing risk capital and supporting high-tech ventures. Over the past decade, risk appetite among investors has grown, and the friction for capital deployment has significantly decreased. Today, Singapore's GDP per capita has surpassed that of many developed countries, and the city-state produces close to 20% of the world's semiconductor devices and equipment.

Strong academic-industry synergy

One of Singapore's unique strengths is the close collaboration between academia and industry. Dr. Tee highlighted the role of NUS in fostering entrepreneurship: "Many of my innovations today come from the university environment, from academia. The ability for faculty, students, and research staff to participate and bring ideas to market is critical."

This synergy is institutionalised through flagship programmes like the NUS Overseas Colleges, which sends students to global innovation hubs such as Silicon Valley to work alongside start-up founders while attending entrepreneurship courses at renowned partner universities. "After years of sending students to Stanford, many of them actually did start companies," Dr. Tee said.

To support this ambition, NUS created dedicated spaces and structured programmes like the Graduate Research Innovation Programme (GRIP) for deep-tech innovations, helping start-ups test and scale their products and services in larger ecosystems across the US, Japan, Vietnam, Indonesia, and China.

Addressing the big questions

At the end of this sharing, Dr. Tee took questions from Dr. Richard B. Dasher, and the audience. These are key highlights from the Q&A session.

Q: What does Singapore need? What would you love to see more of in Singapore?"

A: I think we would need to see more ambitious goals. That's one—aim high. The other thing is, we also need a group of individuals that have been exposed to what scale means, so they can over time develop a propensity to be confident about their abilities.

Essentially, we have to try to punch above our weight and be very confident doing so in some areas. That's certainly not easy but there are successful models. I think we are slowly building that through some of these companies, but they are not yet at unicorn level. But we do see companies that have addressed it from a business innovation angle.

Grab, for example, has been the super app for Southeast Asia. They actually moved to Singapore because of our transparent, operating environment. We also have Sea, which is a very big company that started from a niche market in gaming and has now gone big in e-commerce, and they are now worth over US$80 billion dollars.

Q. We hear of how Asian parents really wanted their children to go to prestige companies and value stability. So how does that look in Singapore? Do you have a lot of young people who really want to be entrepreneurs?

"If you were to ask me this question when I was a graduate student, I'd probably say, like, most people would just want a stable job. In fact, parents discouraged children to actually be an entrepreneur. But I think what has changed over the last twenty years or so is that there have been consistent investments in opportunities for entrepreneurship as an alternative career option for many students.

Over time we realised that the support that we give actually allows them to shine through—their entrepreneurial spirit to shine through. We are a small country, so we will have to work very hard to identify, people that have some capability and drive who want to do some things a bit differently."

Q. A lot of Asian universities have taken this thing where entrepreneurship becomes an academic specialisation. What is it like in NUS?

"I recently had this discussion around entrepreneurship – whether it is nature versus nurture and so on. I actually looked up the dictionary for the definition of entrepreneur. Basically, it is a person who takes substantial financial risk. When taking a class in Stanford, I was probably like a wannabe entrepreneur. And I actually started a company where I have financial obligations to people. Now that is what makes an entrepreneur.

We want to create conditions that allow people to quicky experience that, so they can decide for themselves – is that what they want to be and are they able to handle it."

(↗) Watch the full video

Beyond the classroom

NUSOne meets Entrepreneurship

What is it like to walk in the shoes of an entrepreneur, or build an innovation that impacts lives? With the launch of the **NUSOne** initiative designed to provide a holistic and well-rounded university experience, NUS Enterprise takes students beyond campus to find out.

Close to 300 NUS students participated in a lineup of the NUSOne activities curated by NUS Enterprise, designed to blend hands-on learning and building entrepreneurial mindsets beyond the classroom. The activities ranged from fireside chats with NOC Alumni and industry practitioners to a "Land of Smiles" Thai cultural immersion experience; an adrenaline-fuelled dragon boat challenge to going behind-the-scenes of Google Singapore.

NUSOne is a university-wide initiative designed to enrich students' university experience beyond traditional academics. The NUSOne x NUS Enterprise activities were thoughtfully curated to empower students beyond academic knowledge, equipping them with innovation skills, and a mindset for societal impact. Designed for undergraduates with entrepreneurial aspirations, the activities aim to enable students to develop future-ready attributes, and support their enterprising ambitions.

Read highlights of students' experiences and insights from participating in our NUSOne innovation & entrepreneurship-themed activities by NUS Enterprise.

Savouring sustainability: behind the scenes in google's kitchens

Our students got behind-the-scenes access to Google's Asia-Pacific campus in Singapore last month. One of the most oversubscribed events this semester, the visit shone a spotlight on an often-overlooked frontier of innovation: sustainable food practices.

> "This visit showed me that sustainability is becoming a serious priority across all types of companies, even technology giants like Google, which takes bold steps to lower its environmental impact. This was encouraging to see as it reminded me that there is a real space and demand for sustainability-driven solutions."
>
> **– Prashant Rai**
> Year One student, Faculty of Science

Students explored Google's mammoth campus operation that runs seamlessly throughout the day. Three cafes, 14 micro-kitchens, and several coffee bars serve an estimated 4,000 meals and 1,500 cups of coffee daily.

Yet behind this massive scale lies a thoughtfully engineered system designed to reduce waste and champion environmental responsibility. Single-use plastics removed in favour of reusable containers. Coffee grounds turned into a vital ingredient for fresh sourdough bread.

Spreading kindness by volunteering with project dignity

In a powerful demonstration of how business can drive positive change, our students rolled up their sleeves at Dignity Kitchen — Singapore's first social enterprise food court founded by Straits Times Singaporean of the Year 2024, Mr Koh Seng Choon. During the immersive session, they volunteered alongside the differently-abled and disadvantaged, gaining first-hand insight into how inclusive business models can uplift lives by providing training, purpose, and employment.

Students spent the afternoon preparing homemade rojak and cookies, engaging with senior beneficiaries, and learning how sustainable business models can foster communities. For many, the experience was eye-opening.

More than just a day of service, the activity inspired students to see how entrepreneurial thinking can be applied to create positive, lasting impact.

Crafting identity: students unlock power of personal branding

personal branding isn't just for businesses; it is also a vital tool for students and young entrepreneurs. On 19 March 2025, branding expert Tay Kae-Fong, Founder & Managing Partner of Binomial Consulting, led an intensive workshop comprising interactive exercises and personal sharing sessions.

Students learned how to articulate their unique narratives, tailor their brand voice, and connect authentically with their intended audience. Student entrepreneurs spoke about their own start-up experiences candidly, creating a vibrant and collaborative atmosphere for all.

> "Even a little bit of my time, when put to good use, can put a smile on someone else's face."
>
> **– Esha Kejriwal**
> Year 2 student, NUS Business School

TOP:
All geared up to paddle through Singapore's iconic skyline!

The enthusiasm among participants was evident as the session wrapped up with an engaging Q&A session.

Dragon boat experience builds teamwork and sparks discovery

in September 2024, our students took to the water for an energetic Dragon Boat session that fused adrenaline-pumping action with meaningful team building. Set against Singapore's skyline, this session combined physical challenge with deep personal reflection and cross-disciplinary collaboration.

Under the guidance of the NUS Dragon Boat Team, participants mastered synchronised paddling, raced as one, and forged lasting friendships. "I loved everything — the sport, the teamwork, the people," one student beamed. Another echoed, "It was physical, fun, and gave us a whole new perspective of living to your fullest potential in Singapore."

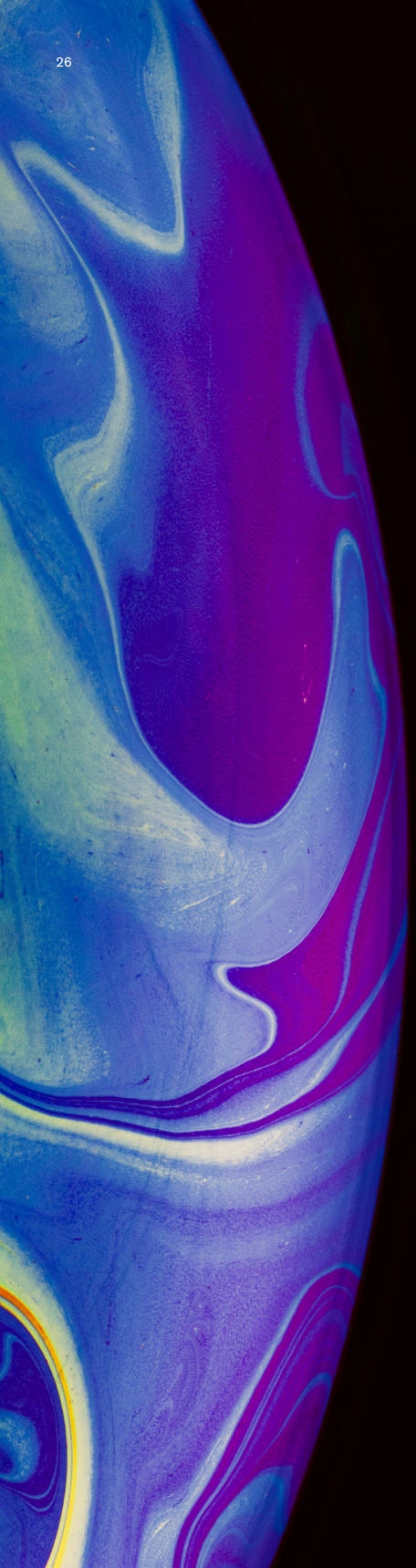
Unlike typical dragon boating activities, this immersive activity was designed not just to teach teamwork and resilience, but to ignite self-discovery and leadership through spontaneous problem-solving, peer learning - all with an entrepreneurial mindset. This unforgettable experience proved that the best learning happens when hearts race, hands unite, and minds open.

Why NUSOne matters

Through the interactive NUSOne activities by NUS Enterprise, students not only gained practical tools, but also cultivated entrepreneurial mindsets - embracing resilience, creative problem-solving, and meaningful self-discovery. These activities challenged them to think critically, act boldly, and lead with intention, while forging lasting connections across disciplines and cultures.

By stepping beyond the classroom, students discover how to lead with purpose, innovate with empathy, and support communities that thrive. With NUSOne, ideas can take root – and take flight in time to come.

Inspired by our activities? Join the **NUSOne x NUS Enterprise Telegram channel** to get exclusive first access to the exciting upcoming events and insider updates.



From AI to quantum solutions:

Singapore showcases next-gen cybersecurity innovation at the RSAC™ Conference

The inaugural Singapore Networking Night saw a great turnout, with cybersecurity innovators, Chief Information Security Officers (CISOs), and Singapore ecosystem builders coming together to discuss global trends.

RIGHT: At RSA Conference 2025, Singapore showcased its cybersecurity capabilities with its first national-level Pavilion, jointly organised by the CyberSG Talent, Innovation and Growth Collaboration Centre and SGTech.

Singapore made its national-level debut at RSAC™ 2025 Conference with a dedicated Singapore Pavilion jointly organised by the CyberSG Talent, Innovation and Growth Collaboration Centre (The Centre), and SGTech. Held from 28 April to 1 May at the Moscone Centre in San Francisco, the conference brought together global cybersecurity leaders and innovators.

The Singapore Pavilion highlighted the nation's growing role as a global cybersecurity hub and strategic gateway to Asia's burgeoning S$10 billion digital economy. Six Singapore-based companies — cloudsineAI, Cyber Sierra, Cybernatics, Invisiron, pQCee and ST Engineering — showcased solutions designed to address some of today's most pressing cybersecurity challenges.

Among them, cloudsineAI and pQCee introduced specialised technologies tackling emerging threats such as GenAI-driven attacks and quantum decryption — threats that traditional cybersecurity tools struggle to address. Most existing tools still rely on broad, one-size-fits-all approaches that lack the precision needed for today's evolving threat landscape. This leaves critical gaps in protection persist, which expose organisations to increasingly sophisticated cyberattacks.

The participating companies are supported by the Centre, a joint initiative between the National University of Singapore (NUS) and the Cyber Security Agency of Singapore (CSA). The Centre aims to drive innovation and grow a vibrant cybersecurity ecosystem in Singapore and beyond.

"Singapore's CyberSG Talent, Innovation and Growth Collaboration Centre, in conjunction with our National Cybersecurity R&D Programme, aims to drive key innovations in the global cybersecurity landscape. We support companies developing advanced digital infrastructure protection, strengthening our nation's defences while empowering collaborative global efforts against a rising tide of cyberattacks, marked by a 30 per cent increase in 2024," said Associate Professor Benjamin Tee, Vice President (Ecosystem Building), NUS Enterprise.

As part of the week-long conference, the Centre also hosted the Singapore Networking Night on 30 April 2025, which brought together around 250 cybersecurity innovators, CISOs, investors, international start-ups, and Singapore ecosystem builders, including key government agencies. The event provided a valuable platform for start-ups to connect directly with CSA, Singapore Economic Development Board (EDB), EDB Investments, and Enterprise Singapore. These agencies play a vital role in supporting business expansion into Singapore and the region, offering strategic insights, resources, and partnership opportunities.

The evening also featured a panel discussion on "Scaling Global Cybersecurity from the Red Dot", with speakers Mr Chua Kuan Seah, Deputy Commissioner of Cybersecurity and Deputy Chief Executive (Development), CSA; Ms Cheri Lim, Chief Information Security Officer, Temasek International; and Mr Gene Yu, Co-founder & CEO, BlackPanda. The session was moderated by Mr Garrettson Blight, Vice President, Global Government Market, Booz Allen Hamilton, and explored how Singapore contributes to the global cybersecurity landscape and scales innovation from a small but highly connected nation.

cloudsineAI

Blocking malicious content in GenAI applications

"In our recent survey of CIOs across Southeast Asia, the top GenAI security concerns were clear: regulatory and compliance challenges, data leakage, and malicious prompts. Our GenAI firewall is built to address exactly these risks, while also tackling emerging threats like hallucinations and toxic outputs."

– Mr Matthias Chin
cloudsineAI CEO

pQCee
Be . Quantum . Ready

Futureproofing data against quantum threats

"As quantum computing advances, the threat to digital confidentiality becomes increasingly real. At pQCee, we believe the time to act is now. With SafeQuard, we are delivering quantum-safe protection today for the documents that matter tomorrow. Our work ensures that sensitive data — whether personal, corporate, or national — remains secure against the threats of a post-quantum world."

–Mr Tan Teik Guan
pQCee CEO

Building the future of air mobility with AquaAge

Assistant Professor Bao Naren, founder of AquaAge, conducting a drone test flight in Japan.

We may be living in a golden age of food delivery — at least in the cities. In Japan's densely populated urban areas, consumers are spoiled for choice with delivery apps and on-demand services. But in rural prefectures, it is a different story. Sparse populations, outdated infrastructure, and tough terrain make logistics a real challenge.

Now, picture this: a sleek black drone descends onto a roadside kiosk. It opens from the top, the drone lands smoothly, and drops off a small package — your drink, ordered 30 minutes earlier through an app, is delivered right on time as promised.

This is the future **AquaAge** is building. As part of the BLOCK71 Japan ecosystem, the start-up is developing and piloting smart drone delivery systems designed for hard-to-reach areas. By harnessing air mobility technology, AquaAge is reimagining last-mile logistics, starting where it is needed most.

Finding that problem-founder fit: from beauty tech to air mobility

AquaAge was founded by Assistant Professor Bao Naren during her postgraduate studies at Nagoya University. Born in Inner Mongolia, China, she moved to Japan over a decade ago to pursue her postgraduate and doctoral studies in information science.

Her entrepreneurial journey began in the beauty tech sector, where she applied her expertise in AI and data analysis to develop skincare solutions for beauty salons across Japan. This experience in commercialising AI technologies gave her valuable insights into building a product and bringing it to market. It also deepened her understanding of problem-founder fit: the idea that a founder's strengths and experience should align closely with the problem they are solving.

The concept of problem–founder fit is behind many successful start-ups. Companies like Netflix, Instagram and Slack began with very different ideas and only found their breakthrough after realigning their focus to better match their founders' capabilities.

For Asst Prof Bao, this shift marked a return to her research roots. With over a decade of experience in autonomous driving and robotics — including postdoctoral roles at the University of Tokyo and Nagoya University — and support from her investor, she repositioned AquaAge to focus on generative AI for autonomous mobility, addressing critical logistics and transportation gaps in suburban and rural regions of Japan and Southeast Asia.

Flying into Japan's air mobility opportunities

One of AquaAge's key priorities is improving last-mile delivery in Japan's rural prefectures, where logistics services often struggle to reach. "Some of these areas have post offices that are rarely visited, and many small ones are closing due to low demand. But people still need medicine, food, and other essentials," said Asst Prof Bao.

Currently, drones powered by AquaAge's technology are used for lightweight deliveries of up to 7.5kg over distances of up to 15km. While these are not yet large-scale commercial operations, they play a key role in bridging the delivery gap.

AquaAge also contributes actively to local mobility initiatives as a member of urban air mobility consortia in Hamamatsu City and Chichibu City, collaborating with other stakeholders to advance the real-world application of spatial intelligence and generative AI technologies.

To scale its solution, the start-up is partnering with drone hardware manufacturers. "These manufacturers can connect their drones to our technology platform, and together, we can offer solutions for sectors like e-commerce and food delivery," she added.

AquaAge is focused on building the technology that powers smart drone delivery. Its platform, AIRPHA, supports autonomous operations by generating detailed digital maps that help drones accurately determine delivery location, avoid obstacles, and communicate using AI.

The end goal? For drones to operate with a high degree of autonomy, requiring minimal to no real-time human intervention during flight. "We are not building drone hardware. Instead, we are developing the backend technology that enables them to operate smarter and more efficiently," she emphasised.

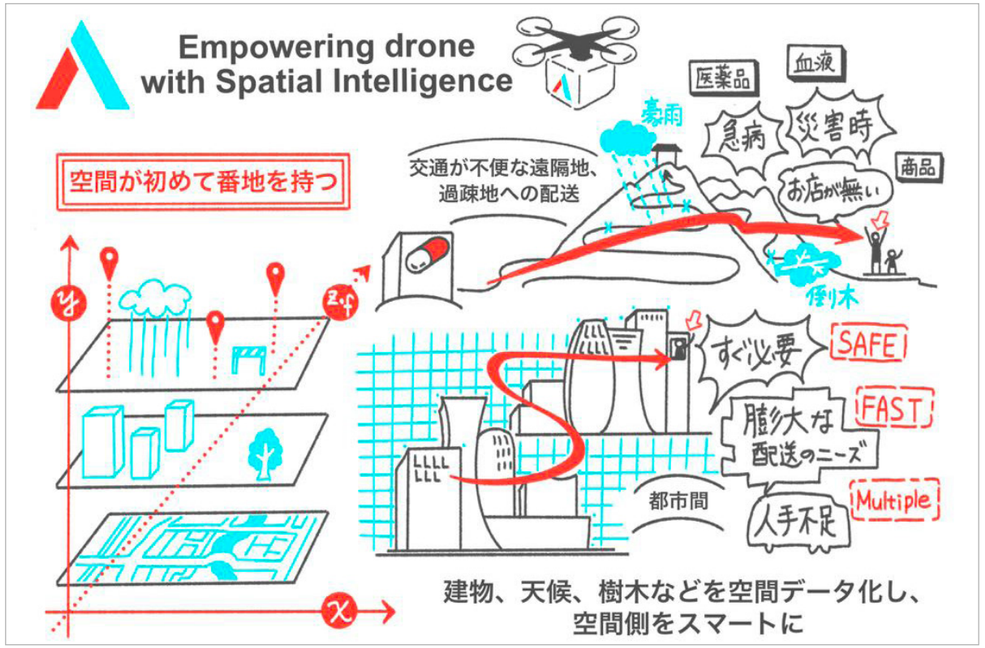
To accelerate its growth, AquaAge is now looking beyond Japan. A recent visit to BLOCK71 in Singapore, NUS Enterprise's global network of physical accelerators, has sparked plans to set up a branch in the city-state.

Scaling up with BLOCK71 in Singapore and the region

The opportunities for air mobility are vast, but so are the challenges. Battery limitations and communication issues still restrict flight range, while regulatory frameworks around drone usage continue to evolve. Public infrastructure needed to support widespread drone delivery, such as landing pads, charging stations, and centralised monitoring systems, are still in its early stages.

"We are even considering relocating our headquarters to Singapore, with Japan as a branch. It makes more sense financially and strategically," she added. "I would like to give special thanks to Mr Yutaka Oba, BLOCK71 Japan Centre Director, for helping us connect with many relevant stakeholders and for assisting us in understanding the Singapore ecosystem. We are truly grateful for his support."

With continued support from BLOCK71, AquaAge hopes to refine its business model, connect with new partners, and expand its air mobility solutions to new markets in Asia.



TOP:
AquaAge's technology (as illustrated in the above diagram) converts elements like buildings, weather patterns, and trees into data to enhance autonomous drone delivery. This spatial intelligence will help enable timely delivery of critical items, such as pharmaceuticals to remote locations.

"Working in beauty tech was a rewarding entry point into entrepreneurship. It helped me appreciate the potential of applied AI and reflect on where I could contribute most meaningfully," she explained. "With my background in autonomous driving research, pivoting to air mobility felt natural and strategically aligned with my core strengths."

ABOVE:
AquaAge's prototype drone is starting to take shape! It is still in the early stages of development and has not yet been equipped with a flight controller or Global Positioning System (GPS).

"Autonomous driving is largely two-dimensional. Cars follow fixed roads, guided by signs and signals, air mobility, on the other hand, adds a third dimension. Aircraft can move vertically and horizontally, which makes the system more complex but also full of opportunities.

There is a clear market gap and no dominant players yet. That is where a tech-driven start-up like ours can really make a difference."

With drone delivery still in its early stages in Japan, Asst Prof Bao saw a rare window of opportunity.

Checklist for entering Singapore and Southeast Asia

1 Singapore offers an ideal base for scaling up in Asia
We are already a global team, with engineers from the Philippines, Indonesia, China, and Japan. Singapore is positioned at the heart of the ASEAN region, which has a combined population exceeding 650 million.

2 Better access to funding
The city-state climbed to 4th place in the 2025 Global Startup Ecosystem Index, up from 5th place in 2024, ranking behind only the United States, United Kingdom, and Israel.

3 More favourable start-up policy environment
The government actively supports drone adoption through regulatory frameworks, pilot projects, and funding for innovation. Also, Mr Yutaka Oba, BLOCK71 Japan Centre Director, has helped us connect with many relevant stakeholders and for assisting us in understanding the Singapore ecosystem better.

4 Boader regional market for drone tech adoption
Singapore hosts high-profile events, such as Drones & Uncrewed Asia and the Aerospace Technology Seminar, which attract global leaders, start-ups, and researchers, facilitating the exchange of ideas and the growth of the drone ecosystem in Asia.

2025 AquaAge is launching a new business in autonomous drone logistics, focusing on its Level 4 drone platform, AIRPHA, with advanced Unmanned Aerial System (UAS)

Currently incubating at BLOCK71 Japan.

2024
- Raised ¥82 million (over S$720,000) in seed funding
- Released HADABON Pro, a SaaS product for personalised skin diagnostics
- Joined the NVIDIA Inception Programme
- Pivoted into the AI and drone technology sector

Received support from BLOCK71 Japan to participate in start-up events in Singapore and gained valuable connections.

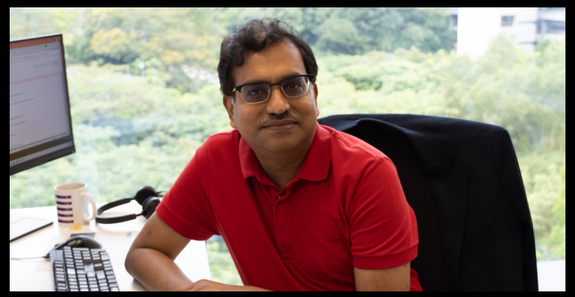
2023 Acquired a patent for AI image measurement technology.

2022-2021 Continued developing AI-driven solutions for various applications.

2020 Began R&D on AI image measurement technology, which uses AI and computer vision to automatically extract quantitative data such as dimensions, area and volume from digital images.

(↗)
Find out more about **AquaAge** and **BLOCK71 Japan**

How my AI start-up got acquired in just 10 months



By
Professor Abhik Roychoudhury

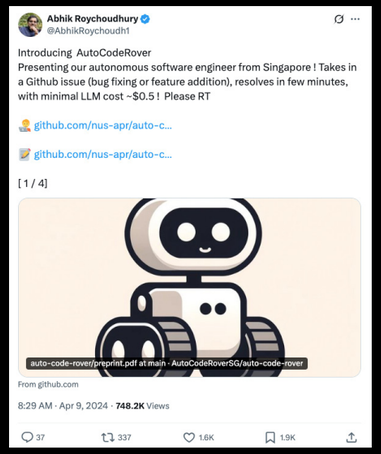
Abhik Roychoudhury is a Provost's Chair Professor of Computer Science at the National University of Singapore. Professor Abhik's research focuses on software testing and analysis, software security and trust-worthy software construction.

From initial setback to swift acquisition, **NUS Professor Abhik Roychoudhury**'s AI start-up AutoCodeRover went from lab to market at breakneck speed – propelled by his bold vision for autonomous coding, a viral tweet, and the prompt decision to go open source on GitHub.

10 months after launch, AutoCodeRover was acquired by Switzerland and US-based code-security giant, Sonar, with their widely used SonarQube tool. In this commentary, Prof Abhik reflects on his start-up journey—and what comes next.

Not many know this. My first start-up attempt failed.

Years ago, mobile apps were becoming very popular, so we developed a very nice app-testing technology. While we were convinced that mobile app testing was to be the next big thing, many companies in Singapore had already outsourced app development to other countries, and hence did not have interest in the quality assurance. It was hard for us to get started, thus.



TOP:
AutoCodeRover gained significant attention online very quickly, thanks to **Prof Abhik's viral tweet** in April 2024 that has garnered over 748,000 views and 337 reshares to date.

AutoCodeRover took off

We have been working on autocoding for long since 2013, and we were one of the first to use the idea of agents – autonomous tools being invoked around large language models, in the domain of software. When I founded my second start-up, AutoCodeRover, this time on agentic AI – I learnt from experience. We knew we wanted to develop a globally competitive tech product that is rooted in Singapore. AutoCodeRover is an NUS spin off, and the intention behind this was for our technology to ultimately contribute back to our innovation ecosystem here.

To test market receptivity and better gauge the viability of our tech product, I published a paper online titled "AutoCodeRover: Autonomous Program Improvement", and shared it in a tweet. It just took off organically after that. Our paper generated a lot of interest among tech experts and venture capitalists, and I was very excited to see that there was real, sustained market interest that went beyond academic circles; industry leaders were commenting on our paper, and not only professors. Suddenly, we were fielding questions round the clock, receiving feedback, and—most importantly—learning there was real-world demand. And all this with zero marketing spend!

Behind Sonar's swift acquisition

I received a few queries of interest in our startup after our work gained traction, but Sonar stood out from the onset. I knew of Sonar very early on as SonarQube is a well known tool in code quality and security, making them a strong partner of choice. More importantly, Sonar's extensive customer base including eBay, BMW, and major global banks would translate into broader adoption and feedback for AutoCodeRover's technology in the long run. Sonar also shares my desire to build from Singapore and invest in its talent pipeline and AI tech ecosystem. Prior to AutoCodeRover, Sonar had sales and marketing in Singapore, and after our acquisition, I am heartened to see Sonar R&D in Singapore!

An AI Agent for Developers

AutoCodeRover works as an AI software engineer that helps developers work more efficiently. It automates key steps in the software development lifecycle including debugging, issue remediation, and code refactoring, enabling developers to address real-world engineering challenges more efficiently.

The proof of the pudding is in the eating, and it is in for production usage as part of the widely used SonarQube static analyser from SonarSource. This is significant for our research at NUS as it reaches the entire customer base of SonarQube involving more than 500 companies! Some customers of SonarQube, such as Uber, have also expressed interest in such fix suggestions to us, most recently! They are interested to work with us and Sonar to really advance the technology!

> "Ultimately a key issue in the tech space is always one of timing – when to hit the market with the right technology. Thus to achieve real impact, we really need to have this sense of timing"

The dilemma of an academic entrepreneur

One key challenge was protecting valuable intellectual property (IP) in the highly competitive global AI tech space, particularly where larger organisations compete to get the latest information on upcoming innovations. This is where our Technology Transfer and Innovation team, specifically Jonathan Tan, came onboard proactively to support us in the legal paperwork behind IP commercialisation. Striking the balance - between keeping our technology closed to protect it and going open source to get meaningful community feedback – was very hard!

Getting students - while technically proficient - to understand the value in continuous innovation, and to have the drive to go beyond publication-oriented research is always important too. This change in mindset is important in our university context, I feel, if we want to have more impact.

Going open source: what I learnt

We decided to release AutoCodeRover as an open-source project on GitHub in the end, making it freely accessible for developers to experiment with autonomous program improvement. The GitHub repository includes setup instructions, docker support, and examples on how to run AutoCodeRover on real GitHub issues. The response has been gratifying.

This also dispels the myth that commercial value cannot be generated from open-source products. Open-source products can help grow interest and build a community – leading to commercial value.

One missed opportunity still lingers in my mind: not launching a Discord server right after the announcement of the effort. It could have accelerated community building, brought in earlier feedback from developers and potential customers.

But I am elated nonetheless with the outcomes we have today, and more excited about what's next.

What next?

My latest opinion piece on AI in coding discusses the emerging role of AI, specifically Large Language Models (LLMs), in automating software engineering tasks and the critical challenge of establishing trust in AI systems.

In the software domain, the focus has always been on programming at scale. Moving forward, the focus may shift to programming with trust, as we see more automation in the software domain.

RIGHT:
The team behind AutoCodeRover. From left: **Mr Haifeng Ruan**, **Mr Yuntong Zhang**, **Professor Abhik Roychoudhury**, **Dr Ridwan Shariffdeen**, and **Mr Martin Mirchev**.

AutoCodeRover discord server
AutoCodeRover Github

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