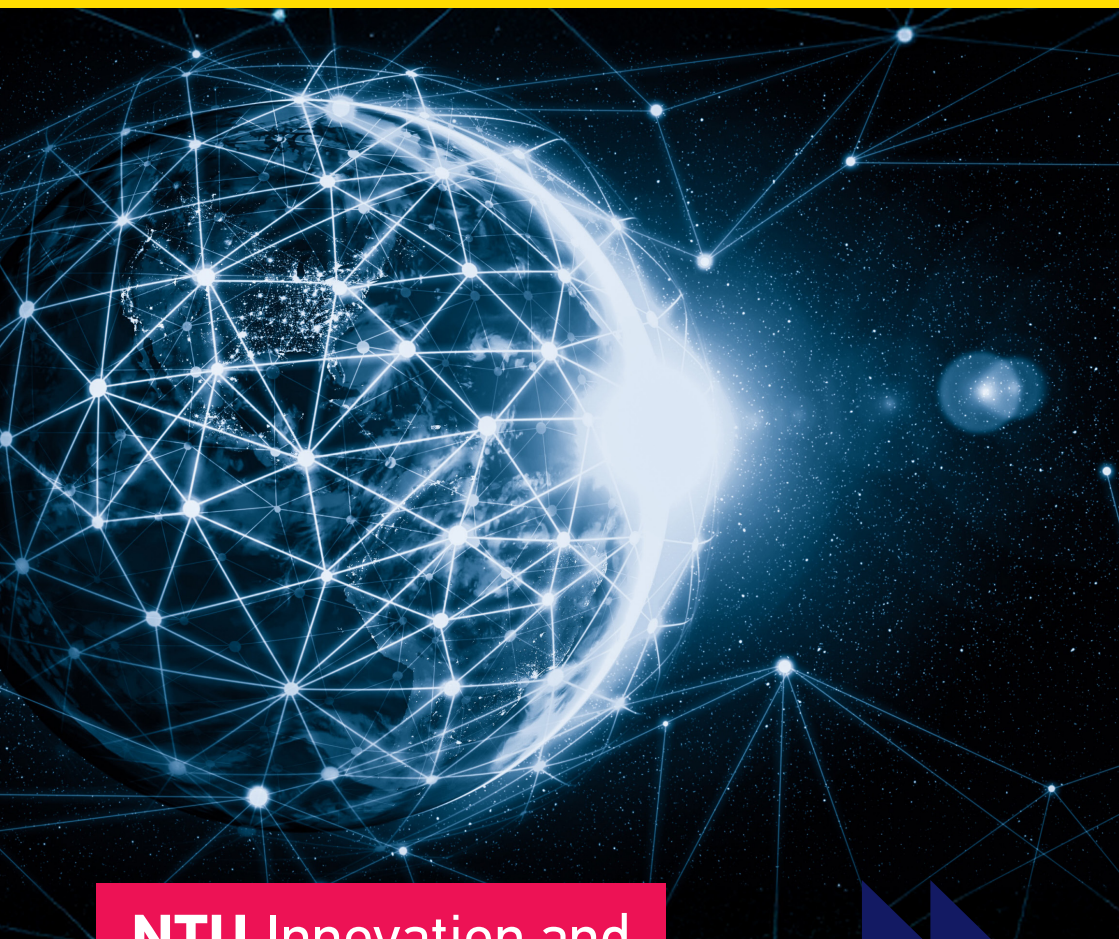




**NANYANG  
TECHNOLOGICAL  
UNIVERSITY**  
SINGAPORE



# **NTU Innovation and Entrepreneurship**

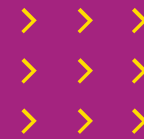
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# About NTU Innovation & Entrepreneurship

NTU Singapore is a world-class university that fosters leaders and societal impact through interdisciplinary education and research. With innovation and entrepreneurship as a key component of NTU's mission, our goal is to translate NTU's inventions into practical solutions that promote Singapore's growth and improve society's well-being.

NTU Innovation and Entrepreneurship (NTU I&E) drives a cohesive and collaborative relationship across various innovation drivers within the NTU community. Through innovation drivers such as NTU Entrepreneurship Academy and NTUitive, we help aspiring entrepreneurs grow their capabilities through holistic entrepreneurship education, experiential learning and enterprising pathways to realise their ambitions.

For more information on how we nurture and support the NTU I&E ecosystem, visit [www.ntu.edu.sg/innovates](http://www.ntu.edu.sg/innovates).



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## Nurturing impact at scale

**NTU President Ho Teck Hua on balancing basic science and entrepreneurship, and why translating ideas into real-world solutions requires patience, persistence, and the right ecosystem.**

Stanford University is well known as a hub of innovation, in part because many students and alumni have gone on to become some of the best-known entrepreneurs in the world. Over a 50-year period, the university has held approximately 13,500 inventions and disclosures. Of those, only one in five has generated any licensing revenue, and only one in a hundred has had a chance at earning US\$1 million or more. Just three spin-offs have crossed the US\$100 million mark — one of them being Google.

Professor Ho Teck Hua, President of Nanyang Technological University, Singapore (NTU Singapore), cites that data to make a point. “Successful commercialisation of research breakthroughs is difficult,” he says.

### Five ways research can fail to bear fruit

Prof Ho identifies five challenges to research commercialisation. The first is weak market validation. Many researchers pursue scientific questions that interest them without engaging the market to see which problems need solving. “Even if a breakthrough is found, the product-market fit is unclear and investors may be

uninterested,” he adds. His antidote to this is to build customer discovery, market testing, and iterative prototyping into the translational pathway right from the start.

The second challenge is one of market size. A scientific advance may not address a market problem large enough to justify the investment needed to commercialise it. Solving this requires researchers to think about economic headroom early in the research process. “Focus on addressing pain points in big markets, for example,” says Prof Ho.

The third challenge is the talent gap in venture building. Technical competence and entrepreneurial competence are different skills, and researchers who are strong in one area may not be strong in the other. “Without venture-building talent, even a good invention will not get off the ground,” Prof Ho says. To fill this gap, NTU committed S\$5 million to a S\$75 million pilot programme supported by partners such as Xora Innovation, the early-stage deep-tech investing platform of Singapore investment company Temasek, to accelerate the commercialisation of deep-tech ventures from university research.

Through the programme, deep-tech founders at Xora work directly with NTU’s intellectual property (IP) and technical teams to develop and refine go-to-market strategies, bridging the gap between scientific expertise and commercial execution.

translational research. Basic research will always be important. This is because the value of its outcomes cannot easily be predicted and many of the most commercially significant discoveries in history began as exercises in pure scientific curiosity.

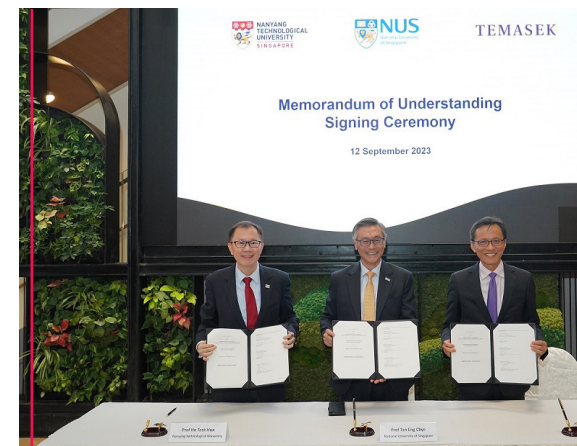
Prof Ho is aware of this. “It can be hard to predict which research ideas are going to have an impact,” he says. He adds that universities must strike a balance between basic and translational research by building an open, creative, and encouraging research environment. NTU does this by ensuring that the University’s infrastructure, resources, and faculty support “empower our scientists to tackle big, difficult, and intellectually challenging problems”. At the same time, the University collaborates closely with industry so that researchers understand where market gaps

exist and can work alongside industry partners to produce outcomes with commercial potential.

“It is the existence of a collaborative and connected ecosystem that has helped our researchers produce work with high intellectual value and high translational value, as well as research with high intellectual value and uncertain translational value,” he says.

### The case in numbers

The results, in aggregate, are tangible. In 2024 and 2025, NTU received the Startup Ecosystem Stars Award presented by the International Chamber of Commerce and global innovation platform Mind the Bridge, with backing from the Organisation for Economic Co-operation and Development, and the European Commission. In a 2023 Clarivate ranking of research organisations most cited by the world’s top innovators, NTU placed seventh globally and was the only Singapore institution in the top ten. The University’s portfolio of spin-offs and startups have a cumulative valuation of approximately S\$1.6 billion.



An initial Memorandum of Understanding on a programme to accelerate the creation of successful deep tech startups was signed by (from left) NTU President Professor Ho Teck Hua, National University of Singapore President Professor Tan Eng Chye, and Mr Russell Tham, Head, Emerging Technologies of Temasek Global Investments.

The fourth challenge is a lack of crucial early-stage funding. After a breakthrough, scientists typically need capital to develop a working prototype, which is needed to attract further investment. Some ideas stall at precisely this juncture — a problem the pilot programme is structured to address.

The fifth challenge is scalability. An invention that works in the laboratory may prove impractical or uneconomical at an industrial scale. Prof Ho’s view is that this should be considered early in the research process, ideally in partnership with industry, so that the business case for supporting the research can be strengthened.

### Basic research and the limits of prediction

The need to engage the market reveals a major difference in the motivations behind basic and

Two recent examples illustrate the successes. Eureka Robotics, an NTU spin-off, develops AI-powered systems that give factory robotic arms greater sensitivity and precision. It raised US\$10.5 million in Series A funding led by B Capital, whose co-CEO is Facebook co-founder Eduardo Saverin, with participation from Airbus Ventures. Amperesand, another deep-tech spin-off focused on power infrastructure for AI data centres, raised US\$80 million in Series A funding co-led by Walden Catalyst Ventures, founded by Intel CEO Tan Lip-Bu and former Samsung Electronics president Young Sohn, and Temasek.



Eureka Robotics was founded in 2018 with the mission of helping factories worldwide automate dull, dirty, and dangerous work, so that human workers can focus on their creative endeavours.



Founded in 2023, Amperesand is a next-generation power infrastructure provider for artificial intelligence data centres and critical power applications.

Forbes has described Mr Tan, an NTU alumnus, as a pioneer of Asian venture capital; his involvement is a reasonable proxy for how the University's innovation pipeline is perceived beyond Singapore.

### Beyond the scoreboard

Revenue figures and startup counts are the standard metrics for university commercialisation. While these numbers are important, Prof Ho argues that “we should also consider other outcomes and indicators.”

The first indicator is researcher development. Commercialisation exposes scientists to industry thinking and helps them learn about market needs, which makes them better at identifying industry gaps and collaborating effectively with industry.

The second indicator is network expansion. Industry relationships built during one commercialisation effort often become assets in the next. Professional contacts could become important partners for future business opportunities, as well as provide insights that help scientists in their entrepreneurial journey. Graduates in the hiring market also benefit when their institution has strong ties to industry.

A third indicator is customer feedback. If a product exceeds customer expectations, that could be a win for a startup even if revenue numbers are not initially strong. This is because good word of mouth from customers can go a long way to bolster a firm's success in the longer term.

“Such impact cannot be easily captured by revenue and startup numbers alone,” Prof Ho says.

### Building across disciplines

One structural asset NTU has invested in is interdisciplinary infrastructure. The University's Interdisciplinary Collaborative Core curriculum requires all undergraduates to work in cross-disciplinary groups — a deliberate attempt to build the habit of integrating insights across fields before students encounter the boundaries of professional specialisation. At the graduate level, the Interdisciplinary Graduate Programme has students concentrating across two or more disciplines rather than one.

“We want to train our students to be interdisciplinary problem solvers who can

break down the walls between disciplines to find solutions,” says Prof Ho.

The University now has numerous institutes and centres conducting multidisciplinary research, and over one hundred faculty members hold joint appointments across schools or colleges. Times Higher Education recently ranked NTU fifth globally in its Interdisciplinary Science Rankings — the only university in Asia in the top five.

Physical infrastructure matters too. The NTU Innovation Port provides spaces specifically designed for cross-disciplinary collaboration, intended to lower the friction involved in getting people from different fields to work on shared problems.

### What comes next

With NTU's research footprint, Prof Ho has a vision for the University's role in Singapore's innovation landscape over the next decade.

Noting that innovation and research translation are important activities for small countries like Singapore, he says that NTU plays its part by helping to spur innovation and research translation in a systematic and purposeful way.

He points to the University working closely with world-class industry partners on research, including major companies like Alibaba and Mastercard. “By doing this, our research serves as the economic engine to help businesses solve their pain points and build better products and solutions faster,” explains Prof Ho.

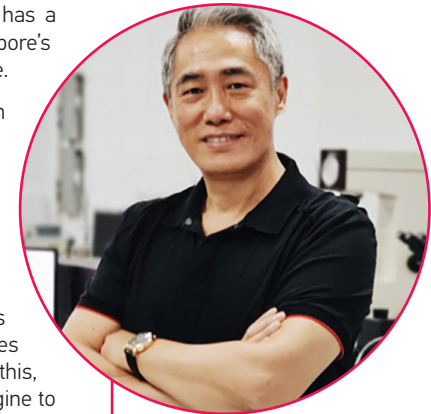
NTU will also have to work with more organisations to accelerate science entrepreneurship and develop a pipeline of deep-tech ventures. For example, the University recently teamed up with US-based non-profit Activate to launch a programme to this effect.

IP licensing presents another opportunity. NTU must conduct research relevant to the world, and which can be licensed to businesses to strengthen their offerings and address their challenges in a timelier way. To this end, NTU is

making it easier for its IP to be licensed, such as by deferring IP licensing fees.

The University needs to build its contingent research capabilities too, so it can leverage them to find solutions during crises like the COVID-19 pandemic. This means supporting researchers in honing their expertise through challenging research problems.

The longer-term ambition centres on the startup ecosystem. NTU currently has one deep-tech unicorn — Nanofilm Technologies International, a nanotechnology solutions firm valued at over US\$1 billion at its peak. Prof Ho wants to improve the odds of producing more unicorns, through careful curation and support. It entails supporting the creation of enterprises that tap on NTU's IP to develop products and services for a global market.



Dr Shi Xu, Founder of Nanofilm Technologies International, which specialises in ultra-thin protective coatings used in many products, from consumer gadgets to automotive parts and optical devices. These innovations are built on proprietary technologies and processes that Dr Shi invented and patented during his time at NTU.

“My hope is that NTU will stand as the best technological university in Asia that is at the forefront of translating research to create societal impact for Singapore and beyond,” says Prof Ho.

