

AI SINGAPORE

ANCHORING DEEP NATIONAL CAPABILITIES IN AI



AI SINGAPORE®

5-YEAR REPORT

CONTENTS

4

FOREWORD BY FOUNDING
EXECUTIVE CHAIRMAN

6

KEY MILESTONES

8

BUILD DEEP NATIONAL
CAPABILITIES IN AI

10

CREATE SOCIAL &
ECONOMIC IMPACT

18

ACCELERATE AI
ECOSYSTEM

22

GROW LOCAL AI TALENT

26

PUTTING SINGAPORE
ON THE WORLD MAP:
THE FUTURE HAS BEGUN

The background of the page features a light blue map of Southeast Asia, including countries like Thailand, Laos, Cambodia, Vietnam, and the Philippines. Overlaid on the map is a network of thin white lines connecting various points, suggesting a digital or technological theme. The text is positioned in the lower-middle part of the image.

● ANCHORING DEEP NATIONAL CAPABILITIES IN AI



AISG plays a crucial role in our journey towards becoming a Smart Nation. By 2030, Singapore aims to become a global leader in developing and deploying scalable Artificial Intelligence (AI) solutions, to create social and economic impact and value to our citizens and businesses.



FOREWORD

I'm pleased to present you with our 5-year e-report, "Anchoring Deep National Capabilities In AI".

Since AI Singapore (AISG) was launched in 2017, we have set our sights on building a vibrant and sustainable AI ecosystem. By bringing together Singapore-based research institutions and AI start-ups and companies, where they can share knowledge and develop products, talents and tools, we can grow capabilities crucial to powering our digital economy forward.

These capabilities will help to address a broad range of challenges in our post-pandemic world, including increased healthcare demands, next-generation learning innovations, and climate change.

And how far we've come. Our programmes support projects and partnerships across research, technology, innovation, products, governance and talents. But we're not stopping here - our vision is to put Singapore on the world map.

As Minister Lawrence Wong outlined during Budget 2023, nurturing and sustaining innovation is the only way to fulfil our potential, with a \$25-billion investment earmarked for research, innovation, and enterprise from 2021 to 2025. Measures such as this will enhance our activities and strengthen our confidence.

AISG's sights are already set on this new frontier filled with opportunities and possibilities.

We hope you will enjoy reading about our key highlights over the last 5 years – these are a testament to our commitment to collaborate and build an AI-ready Singapore!

Professor Ho Teck Hua

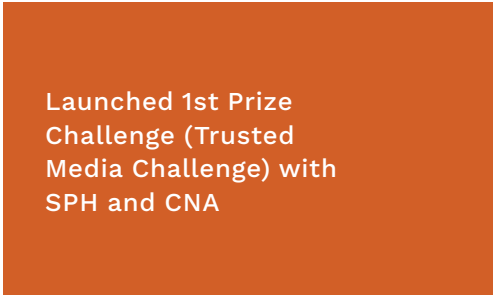
Founding Executive Chairman

KEY MILESTONES 2017 TO 2022

With a blueprint purposed to foster research, technology, innovation, products, governance, talents and collaborations, AISG has forged the path for growth and impact. There's no stopping Singapore towards our future as a global AI powerhouse.



AI for Everyone
(96,000 since
Aug 2018)




Launched 1st Prize
Challenge (Trusted
Media Challenge) with
SPH and CNA



Launched AI
Apprenticeship
Programme




Completed 62
100 Experiments Projects;
34 in progress



Trained 200th AI
Apprentice from AIAP



Launched 1st AI Governance
Research Grant Call and
awarded 9 Projects



Launched 4 AI Research
Grant Calls and
awarded 24 Projects

Sponsored
32 AISG PhD
Scholarships

Launched AI in
Education Grand
Challenge

Launched 1st
AI Speech
Lab

Launched AI in
Health Grand
Challenge

AI for Industry
(9,700 enrolled
since Aug 2018)

Launched AI
Readiness Index
(AIRI) for Businesses

Awarded Singapore
Talent Accelerator for
AIAP (IDC, 2019)

Developed ASEAN
Core NLP with
Regional Partners

Launched 1st AI for
Kids storybook
“Daisy and her AI Friends”



GPAI Partnership
(Co-Chair of Innovation
and Commercialisation
and Broad Adoption of
AI Working Groups)

Rolled out 1st AI
Certification for
Engineers (2019)

Launched 1st Multilingual
(English, Malay, Chinese, Tamil)
AI for Everyone Edition



BUILD DEEP NATIONAL CAPABILITIES IN AI

To ensure Singapore stays at the forefront of global AI thought leadership, the AI Research pillar supports fundamental research, nurtures local research talents and encourages national-level collaborations.

AI RESEARCH

RESEARCH GRANT CALL 2018-2021: 24 PROJECTS AWARDED

Investing early in AI has paid off for Singapore. We are often ranked among Top 10 countries at prestigious AI conferences, and our research talents recognised internationally for their work. To sustain our economic competitiveness, nonetheless, there's more to be done, as we continue to strengthen our capabilities in AI research.

Full list of awardees here. ●●●

TEACHING AI TO THINK LIKE HUMANS ●●●

Dr Basura Fernando
(A*STAR)



CREATING ROBOTS THAT ARE CLEVER COMMUNICATORS ●●●

Asst. Prof Harold Soh
(NUS)



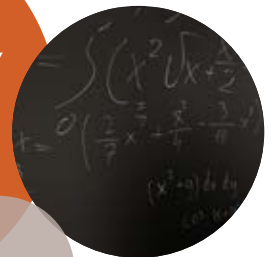
EXPLAINING AI IN A WAY THAT ISN'T ALL GOBBLEDYGOOK ●●●

Assoc. Prof Jun Sun
(SMU)



LEARNING TO LIVE WITH NOISY DATA ●●●

**Asst. Prof Ernest
Chong** (SUTD)



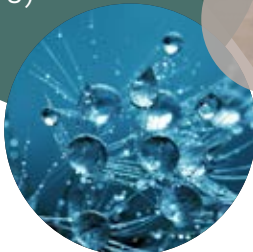
TO GUARD AGAINST AI ATTACKS, FIRST THINK LIKE A BADDIE ●●●

Assoc. Prof Bo An
(NTU)



AI MODELS THAT PROTECT YOUR PRIVACY ●●●

Asst. Prof Yu Han
(NTU)



TEACHING AI MODELS TO LEARN LIKE HUMANS ●●●

Dr Zhang Mengmi
(A*STAR)



CREATE SOCIAL & ECONOMIC IMPACT

AI GRAND CHALLENGES


Open-ended outcome-driven challenges that effectively address Singapore's most crucial issues such as health and education. ●●●

To promote bold AI solutions to solve national and sector-wide challenges, the AI Technology pillar focuses on developing AI technologies that create significant social and economic impact and establish Singapore on the world map.

AI TECHNOLOGY

AI in Health Grand Challenge

Organised in collaboration with the Ministry of Health (MOH), MOH Office for Healthcare Transformation (MOHT) and Integrated Health Information Systems (IHIS).

Among the teams awarded was “Jarvis-DHL – Transforming Chronic Care for Diabetes, Hypertension and Hyperlipidemia with AI”, led by  Professor Wynne Hsu (NUS).

By plugging informational and behavioural gaps among patients and physicians, the system brings about the following benefits:

- Predictive care for 3H patients, through early screening and risk stratification
- Evidence-based personalised care, and shared decision-making by primary care physicians
- Right-site care of patients, hence personalising treatment for holistic clinical decision-making

Jarvis-DHL aims to focus resources on patients at greater risk and empower them to take ownership of their healthcare journeys. It does this by harnessing 4 tools:

- Jarvis-DHL Primary Care Decision Support Tool, which uses similarity analysis so clinicians can guide patients on ways to manage their condition
- Jarvis-DHL Advanced Care Decision Support Tool, which can predict the risk of diabetic complications and responses to treatments
- Jarvis-DHL Screening Tools, which help to detect risk of diabetic complications through advanced AI on image analysis of both heart scans and eye fundus photos
- Empower Behavioural Nudging, to develop patient-facing wearables and a mobile phone app to help motivate, monitor and maintain lifestyle behaviour, and an emotion-aware robot that offers companionship

How can AI help primary care teams stop or slow disease progression and complication development in 3H – hyperglycemia (diabetes), hypertension (high blood pressure) and hyperlipidemia (high cholesterol) – patients by 20% in 5 years?



HOW JARVIS-DHL WILL CHANGE SINGAPORE'S HEALTHCARE LANDSCAPE:

“The tools developed under Jarvis-DHL are currently undergoing clinical trials at various SingHealth polyclinics and specialist clinics. We believe the tools can enable physicians to engage patients more effectively, leading to greater treatment adherence and maintenance of healthy lifestyle which are the keys to slowing disease progression and complications of DHL.”

Prof Wynne Hsu

Director, Institute of Data Science, NUS



“Jarvis-DHL is a collaboration between AI scientists and healthcare professionals, which is the key strength of the project. Unlike in the past, we no longer work in silos and struggle with challenges on our own – we can now exchange experiences and share solutions. This allows our work to be scaled up to the national level to benefit more people.”

Prof Marcus Ong

Director of Research and Clinician Scientist, Department of Emergency Medicine, SGH



AI in Education Grand Challenge

Organised in collaboration with Ministry of Education, this grand challenge supports AI research from development through to validation and deployment. Submission closed in September 2021.

AI IN EDUCATION GRANT AWARDEES: DR NANCY CHEN (A*STAR) ●●● AND ASSOC. PROF DONNY SOH (SIT) ●●●

Mother Tongue Language education is crucial to avoid knowledge gaps, hasten learning and comprehension, and preserve cultural and traditional heritage, according to Unesco. In Singapore, however, English is more frequently spoken among residents aged five and older, instead of Mother Tongue languages.

The AI in Education Grant project develops models and tools to promote interest in Mother Tongue Language learning among Primary 1 and 2 students; to enable teachers to impart knowledge more effectively; and to help parents struggling with using it.

“By using AI to identify interest and capability among students, we can propose appropriate intervention strategies and offer technical support,” says **Dr Nancy Chen**, Group Lead and Principal Scientist, Institute for Infocomm Research, A*STAR.



Assoc. Prof Donny Soh, Programme Leader of BSc (Hons) Applied Artificial Intelligence (AAI) at SIT, describes it as “a virtual tutor” that encourages and engages students in conversation about various topics. **“Children learn differently so we will be including fun elements such as daily challenges,”** he adds.



How can AI enhance the Mother Tongue Language learning environment at home for Primary 1 and 2 students to increase oral proficiency by 20% after 2 years?



The research seeks to enrich Singapore’s education landscape by contextualising the learning of Mother Tongue Languages. Says Dr Chen: **“In addition to the inability to provide factually correct outputs, Large Language Models are trained on internet data, which may not always represent Asian content well. They model semantic information very well but are not so strong in pragmatic aspects such as cultural understanding of the ethnic groups, which can become a concern.”**

Contextualising learning also ensures that students are picking up the correct nuances in Mother Tongue Languages. Some words, Assoc. Prof Soh points out, have a negative connotation in colloquial conversation understanding that Large Language Models cannot detect. **“Eventually, we hope to have our research work in tandem with these models and enable students to achieve their learning objectives.”**

AI for Materials Discovery Grand Challenge

Organised in collaboration with the Future Systems and Technology Directorate, MINDEF Singapore and DSO National Laboratories, this grand challenge encourages development of innovative approaches that assist scientists with efficient exploration across 2 material classes: advanced alloys and multi-functional composites. Applications closed on 31 March 2023. ●●●



How can we design robust CV systems for AVs that can recover at least 80% of their original accuracy after physical testing-time adversarial attacks?

How can AI accelerate inverse material design to discover advanced materials that are 50% lighter while retaining and/or enhancing their functional properties?



Robust AI Grand Challenge

Organised in collaboration with the Future Systems and Technology Directorate, MINDEF Singapore and DSO National Laboratories, this grand challenge supports innovative approaches that address the vulnerabilities of AI models in CV (computer vision) systems for AVs (autonomous vehicles) in terms of object detection, stereo depth estimation, and semantic segmentation. Applications closed on 31 March 2023. ●●●



OPEN-THEMED TECHNOLOGY CHALLENGES

A bottom-up approach to encourage innovations that can be adopted by the public sector and the industry to solve important sector-wide issues.

Three calls were made in 2021 and 2022. Here's a quick recap of the awarded projects:

July 2021 Call

REAL-TIME DEEP LEARNING NETWORKS FOR FRAUD DETECTION IN MODERN E-MARKETPLACE SYSTEMS Prof He Bingsheng (NUS)

Addresses increasing digital fraud risks faced by businesses and customers with new AI/ML techniques to improve detection rates



NOVEL CONTEXT-AWARE MULTIVARIATE TIME SERIES MODELLING FOR UNDERGROUND TRANSPORTATION INFRASTRUCTURE MONITORING AND MANAGEMENT Prof Yang Yaowen (NTU)

Reduces disruptions and downtime due to sudden tunnel failures by developing a framework for real-time monitoring and condition assessment, and predictive maintenance



KEEPING SINGAPORE'S RAILWAY NETWORK SAFE & STURDY

Every day, nearly 3 million people in Singapore use the public rail transport, which spans more than 140 stations across 6 different lines. Our rail transport is supported by an elaborate network of underground tunnels, and sudden disruptions and downtimes can result in hefty economic loss.

"Our AI-based smart sensing system is designed to improve safety, efficiency and resilience of Singapore's underground tunnels," says Project Leader, Prof Yang Yaowen from NTU's School of Civil and Environmental Engineering. His team is working with LTA, SMRT and Kajima Technical Research Institute on this project.

Real-time data from fibre optic sensors and wireless accelerometers is collected from the underground tunnels to assess anomalies in the ground and environment, and further analysed to predict potential faults of the system and its future performance.

Installation on-site is being planned to cover several kilometres. **"Singapore has different lines built at different times with different technology. So, it's important to ensure that our monitoring system can adapt to the unique traits, such as soil condition and track curvature, at each tunnel. But I look forward to expanding it to cover the entire underground tunnel network in Singapore,"** adds Prof Yang.

RAPIER – RADIOLOGY PATHOLOGY INFORMATION EXCHANGE RESOURCE Dr Liu Yong (A*STAR)

Develops a RadPath data lake and AI-driven tools that augment specialists in early detection, accurate diagnosis, and prompt treatment of liver disease



February 2022 Call (Public Sector Edition)

INTELLIGENT TELEPHONE TRIAGE IN PRE-HOSPITAL EMERGENCY CARE

Asst. Prof Feng Mengling (NUS)

Addresses the rising demand of pre-hospital emergency care service with an AI buddy to assist emergency call takers for faster and more accurate telephone triaging



April 2022 Call (Industry Edition)

TRANSFORMING WASTE RECYCLING WITH MULTI-SPECTRAL AI TECHNOLOGIES **Assoc. Prof Ngai Man Cheung** (SUTD)

Builds an automatic plastic sorting system that can be integrated into waste processing pipelines to increase sorting efficiency by up to 15 times and contribute to Singapore's zero waste vision ●●●

TOWARDS SEMANTIC-AWARE MULTIMODAL AND MULTILINGUAL DEEP LEARNING SYSTEMS FOR E-COMMERCE APPLICATIONS **Asst. Prof Luu Anh Tuan** (NTU)

Improves systems of e-commerce companies with AI technologies that can handle low-resource languages in Southeast Asian markets and multimodal inputs to uncover complex semantics ●●●

SMARTRX: SAFE MEDICATION PLATFORM AUGMENTED BY ARTIFICIAL INTELLIGENCE FOR PRESCRIBERS **Dr Yang Feng** (A*STAR)

Reduces medication errors and associated risks through an AI-assisted platform that accesses extensive prescription and patient data, and continually learns to detect medication errors and predict adverse drug reactions more accurately ●●●

PRIZE CHALLENGES

These large-scale regional or global competitions present state-of-the-art AI technologies that solve issues relevant to the public and private sectors and create significant socioeconomic impact.

By generating global buzz in AI technologies and applications and galvanising talents to contribute ideas, these events also help increase Singapore's profile as a leading AI hub.

The Trusted Media Challenge, which took place from 15 July to 15 December 2021, attracted nearly 600 participants from across 45 countries. To fulfil the objective of leveraging AI to detect and combat fake media, teams had to build models to return a probability that a video was fake. ●●●

Three winning teams – WILL (ByteDance), IVRL (EPFL), and HideOnFakeBush (NTU, SMU, Kyushu University) – received cash prizes of more than \$150,000. One team is currently working with two international start-ups in fraud detection and another has published two papers based on their outputs including a DeepFake survey paper in the IJCV journal and a face de-identification work at the ACM-MM contributing to advancements in the field.



AI GOVERNANCE RESEARCH GRANT CALL 2021: 9 PROJECTS THAT WILL HELP US OVERCOME TRUST ISSUES IN AI

Transformative technology offers tremendous opportunities but raises ethical concerns and the potential for harm. The AI Governance pillar promotes research that mitigates the risks of AI through promoting fairness, accountability, transparency, ethics, and safety. Governance is broadly understood to include laws, markets, networks, standards, and other tools. In addition, the utilisation of AI will be enhanced by faith that the end-to-end process is robust and accountable. AI Governance also encourages interdisciplinary research into understanding the factors that shape perceptions of human-machine interaction, influencing the adoption of beneficial AI.

HOW READY ARE WE TO TRUST USING AI IN MEDICINE? A STUDY ON COMPLIANCE TO GOVERNANCE, ENGAGEMENT OF STAKEHOLDERS AND INTEGRATION INTO MEDICAL SYSTEM
Prof Joseph Sung (NTU)

Examines insights into real-world deployment issues regarding relevance, applicability and compliance of governance guidelines. It also constructs a framework on auditing compliance, engaging stakeholders and integrating AI protocols into the medical ecosystem ●●●

TRUST, FAILURE AND TRUST RECOVERY IN FINANCIAL EXCHANGES: TOWARDS A CULTURALLY-INTELLIGENT, DYNAMIC AND SENSING AI
Assoc. Prof Georgios Christopoulos (NTU)

Focuses on principles used to develop reliable AI, and how when it fails, to rebuild that trust in a culturally sensitive way ●●●

ATTAIN*SG: ACHIEVING PUBLIC TRUST IN AI IN AUTONOMOUS VEHICLES IN SINGAPORE
Prof Shirley Ho (NTU)

Investigates how public trust in AI governance motivates or hinders AI-enabled autonomous vehicles, with a focus on communication, social science, legal and engineering perspectives ●●●

AI GOVERNANCE

TRUST IN AI AT WORKPLACES

Assoc. Prof Tong Siliang (NTU)

Examines how AI can be used to motivate and manage workers, as well as strategies to overcome resistance to these technologies ●●●

TRUST EXPERIMENTS – MEASURING TRUST IN AI AS ACTIONS, WHAT RAISES AND REDUCES TRUST, AND WHAT INNOVATORS AND ORGANISATIONS CAN DO TO DESIGN FUTURE TRUSTED AI

Poon King Wang (SUTD)

Investigates public trust in AI, and how to systematically evaluate current standards, frameworks and policies and scale future ones ●●●

PREPARING FOR THE ERA OF AI-POWERED SYNTHETIC ADVERTISING: THEORETICAL DEVELOPMENT, PRACTICAL AND POLICY RECOMMENDATIONS

Assoc. Prof Chen Lou (NTU)

Identifies knowledge gaps in consumer literacy towards AI-powered synthetic advertising and offers evidence-based policy recommendations to regulatory bodies in Singapore ●●●

AUTOMATING TRUTH & ACCOUNTABILITY? PUBLIC ATTITUDES TOWARD AI AND HUMAN-MACHINE COMMUNICATION IN SINGAPORE

Assoc. Prof Edson Tandoc (NTU)

Provides insights into concerns and expectations of AI-powered communication, and how to share information about AI errors to the public, with the goal of helping to increase AI preparedness and resilience ●●●

GOVERNANCE AND POLICY DESIGN LESSONS FOR BUILDING TRUST IN AI: PERSPECTIVES FROM SINGAPORE AND ASIA

Dr Araz Taeihagh (NUS)

Suggests policy instruments to build and improve trust in AI applied in areas such as surgery and justice, and supplements the AI Readiness Index ●●●

MANDATED VS AUTONOMOUS AI USE: AN EMPIRICAL EXAMINATION ON WORKER'S LABOUR OUTCOMES AND SOCIAL WELFARE

Asst. Prof Nakyoung Kyung (NUS)

Assesses the impact of different AI use modes in enabling more appropriate allocation of resources and in improving workers' performance and empowerment ●●●

ACCELERATE AI ECOSYSTEM

To accelerate industry-wide adoption and deployment of AI solutions, the AI Innovation pillar focuses on establishing project standards and frameworks for businesses.

AI INNOVATION



100 EXPERIMENTS (100E)

The **100E** programme helps organisations to solve their artificial intelligence (AI) problem statements and thereby build their own AI teams. ●●●

The programme structure, which typically lasts 7 to 18 months, works like the following:

- AISG will provide co-funding of up to S\$330,000 per 100E project for the Principal Investigators (PI) from Singapore's autonomous universities, A*STAR research institutes or other Singapore-based publicly funded research institutions to work on the organisation's problem statement
- The organisation is then required to match the funding in-kind (AI/engineering/IT/domain manpower) and in cash
- AISG's engineering team will be assigned to join the PI and his research team for a 12 to 18-month 100E project or fully undertake a 9-month 100E project to develop and deploy an AI minimum viable model
- The AISG team is staffed by full-time AI, data and platform engineers as well as apprentices from the AI Apprenticeship Programme (AIAP)®



**Information accurate as of December 2022*



AISG worked with SOMPO on a machine learning model to achieve 100% screening of claims received – that would be nearly 30,000 every year – and improved turnaround time hence customer experience. Since adopting AI in June 2020, the company has saved on manpower costs. It also bagged an AI award from a business publication. There are plans to introduce this model to other offices in countries such as Thailand, Indonesia and India. ●●●



AISG worked with IBM on product quality problem detection to help identify customers' concerns quickly and accurately. AI helped to augment its engineers' capability to deal with a great deal of information – from weeks to minutes – with many workstreams completely automated. AISG partnered the company to develop risk classification models and leverage predictive analytics, enabling staff to avoid problems. All these translated into cost savings. ●●●



AISG worked with uParcel, the largest homegrown, same-day delivery company, to develop a clustering algorithm which was used to group pick-up and destination points based on their distance proximity. This helped to reduce the drivers' travelling distance while completing more jobs, increasing their efficiency, income and customer satisfaction. ●●●

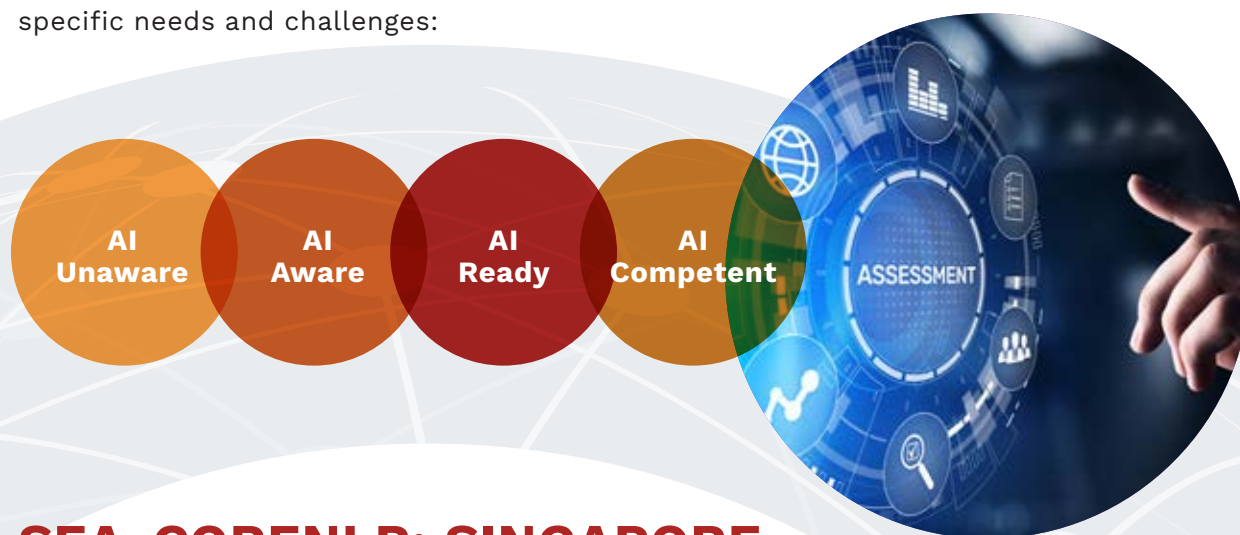


INTERVIEW WITH
SOME PROJECT
SPONSORS

AI READINESS INDEX: HOW IT VALUE-ADDS TO YOUR ORGANISATIONAL GOALS

AIRI (AI Readiness Index) allows businesses and organisations to assess their AI readiness and identify gaps between current and desired positions. This enables them to understand and pick suitable approaches and programmes to accelerate their AI journeys.

AIRI features the following categories, each with recommendations to address specific needs and challenges:



AI Singapore has partnered with organisations such as Google, EnterpriseSG, Singapore Polytechnic and IMDA to map their programmes to AIRI. In addition, AIRI has been adopted by GPAI and will be made available to 29 member countries of GPAI in June 2023. ●●●

SEA-CORENLP: SINGAPORE BRINGS SOUTHEAST ASIA TO THE FOREFRONT WITH NATURAL LANGUAGE PROCESSING AI

SEA-CoreNLP began as a solution to fill the gap in NLP capability between English and major languages in Southeast Asia. An open-source project, it covers “core” tasks such as part-of-speech tagging, syntactic parsing, and semantic role labelling.

To enrich Singapore’s AI ecosystem and accelerate adoption by the industry, the AI Products pillar focuses on developing

products and solutions with the power of Large Language Models, thus enabling them for business and commercial use.

As an initiative by AI Products, SEA-CoreNLP is envisioned as a one-stop solution for Natural Language Processing (NLP) in Southeast Asia (SEA). By spearheading projects and partnering like-minded entities, we want to build for the region a rich and diverse NLP ecosystem. ●●●

Partnership is Part of the Process

By collaborating with other NLP experts throughout SEA, we have built a network that includes Thailand, Indonesia, Vietnam, the Philippines, India and Sri Lanka. We established a mechanism to develop new corpora for major languages. There are 15 new corpora in development languages – 5 have been completed.

Using these new corpora, we have trained new NLP models. We have also pre-trained a 334 million-parameter IndoSpanBERT language model, which is used to power the state-of-the-art Indonesia conference resolution and constituency parsing models. Head here for other updates.

ACHIEVEMENTS

PUBLICATIONS

- 1 conference paper, Georgetown University Round Table 2023 SyntaxFest ●●●
- 1 journal paper (conditionally accepted), ACM Transactions on Asian and Low-Resource Language Information Processing ●●●

APPLICATIONS

- Indonesian/Malay CoreNLP pipeline for document summarisation

PRESENTATIONS

- ASEAN ICT Virtual Organization of ASEAN Institutes and NICTO (IVO) 2022 Forum ●●●

AI PRODUCTS

3 FOCUS AREAS FOR THE FUTURE

- Modernise the approach, while allowing for recent GPT-like large model development
- Increase collaborations with industry players to develop products to solve practical needs
- Strengthen and expand our partnership network in Southeast Asia

GROW LOCAL AI TALENT



To achieve our vision to become a Smart Nation by enriching the ecosystem with well-nurtured talents to drive programmes to empower our citizens to become data-savvy, AI-competent and AI-ready.



AI APPRENTICESHIP PROGRAMME: 275 SINGAPOREAN AI ENGINEERS TRAINED SINCE 2018

Singapore's journey towards AI readiness required a core group of AI talents that understood our challenges and were committed to solving them. AISG hence established the **AI Apprenticeship Programme (AIAP)**[®] to identify, train and groom Singaporean AI engineers. ●●●

AIAP is a full-time programme where apprentices undergo 9 months of deep-skilling and real-world AI projects. After completing 2 months of training, participants are placed with an AI 100E project for 7 months to hone their competencies in AI learning and deploy real-world AI models.

This innovative coupling of AIAP and 100E has helped to develop homegrown AI talents and expand their career opportunities in AI-related roles. It has produced 275 AI apprentices over 12 batches, with over 80% receiving more than 2 job offers each.

To cater to the strong demand from both the industry and Singaporeans, there are plans to double the number of AI apprentices trained over the next 5 years.

AIAP was named "Talent Accelerator in Singapore" at the International Data Corporation Digital Transformation Awards in 2019.

AISG PHD FELLOWSHIP PROGRAMME: 32 FELLOWSHIPS AWARDED

The AISG PhD Fellowship Programme supports top AI research talents to pursue PhD studies in a Singapore-based autonomous university. It develops local talents to perform advanced fundamental

AI research and produce state-of-the-art AI algorithms, models and systems. These talents can then contribute to Singapore's AI ecosystem. ●●●

LEARNAI: AI PROGRAMMES FOR EVERY GENERATION

LearnAI establishes a curriculum of generational AI capability programmes with the purpose of building of AI-aware and -ready talents for Singapore's digital future. It is targeted at students and working professionals and offers self-directed learning resources to help them embark on or accelerate their AI journey.

One key initiative launched in 2022 was **Building Generational AI Capability Development**. To give younger Singaporeans a head-start is an **AI for Kids (AI4K)® Storybook – Daisy and her AI Friends**, which introduces basic AI concepts such as computer vision and machine learning. Daisy, a two-legged binary-speaking computer, finds herself lost on her first day in school. She gets help from other characters, each of whom teaches her a tech-related concept to help her find her way.

AI for Everyone (AI4E)® is a programme that introduces participants to AI technologies and application in our daily lives and includes hands-on practice to build an AI model with online tools. It is available for students and teachers via the Ministry of Education's Student Learning Space platform; for public services officers via the Civil Service College's learn.gov.sg platform; and as a foundation course in polytechnics and institutes of technical education. More than 61,000 people have attended this programme to date.

Clara Tan, a Primary 6 student in Raffles Girls' Primary School, attended an AI4E online course during her term break in March. Intrigued by AI, she wanted to learn more about the topic and how it would affect our future. And among her pleasant discoveries: **"AI can take over tasks but not jobs, hence people will not lose their jobs to AI!"**





Meanwhile, John Saw, a Senior Diffusion Process Engineer with Micron Semiconductor Asia Pte Ltd, joined the **AI for Industry (AI4I)**® programme. He learnt

how to use AI to complete tasks faster and better. The knowledge benefited others at work too: **“I developed an app to help my department speed up on narrowing primary factors that caused unwanted process outcomes,”** he says, **“and help us break free from loads of late nights required to stabilise and improve process outcomes.”**

AI Student Outreach Programme is aimed at students from secondary school to university as well as those in NSF. It equips them with AI literacy essentials across basic, intermediate and advanced levels. It has benefited over 100 Student User Groups (SUGs) and 3,000 students.



“The programme is a great opportunity for students to start their AI learning journey by teaching the basic concepts and scaling up to more advanced concepts as they become accustomed to AI. Furthermore, experienced students may be able to obtain more knowledge beyond what is taught in the school’s typical curriculum.”

Chan Jian Sheng, Republic Polytechnic SUG

“While many online courses are available, self-learners can find it overwhelming. The AI Student Outreach Programme prevents this with a comprehensive yet clear learning track that covers everything from basic to advanced knowledge.”

Pham Thuy Linh, Nanyang Technological University SUG. She received a Google Professional Machine Learning Engineer Certificate after completing this programme.

EXPLORE

Discover other programmes in **LEARNAI** and **#PLUSskill** yourself to be ready for an AI world. ●●●



The background of the page features a large, stylized world map in shades of orange. A red location pin is placed over the Southeast Asian region, specifically pointing towards Singapore. The map is partially obscured by a large white circular shape on the left side, which contains the text blocks.

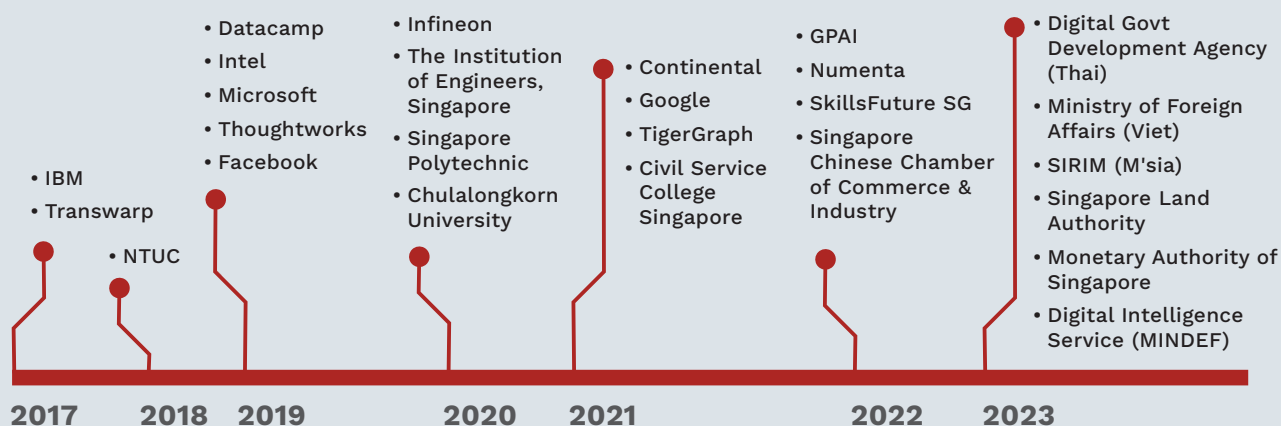
PUTTING SINGAPORE ON THE WORLD MAP: THE FUTURE HAS BEGUN

Integral to a vibrant and sustainable ecosystem where AI can be used to solve global and national economic and social challenges is the community AISG seeks to build.

Our vision is powered by relentless endeavours in supporting fundamental AI research and nurturing local talents.

Collaborations and partnerships with like-minded companies and governments also enable us to continue to refine and develop programmes, products and services, and establish Singapore as a leader in AI solutions.

OUR PARTNERSHIPS



That's not all. AISG also actively participates in global standards bodies such as International Organization for Standardization (ISO) and IEEE Standards Association. It enables us to stay in step with developments and adopt protocols relevant to local industries, hence advancing our nation's AI-readiness.

An AI Technical Committee, which represents Singapore as a participating member in ISO/IEC JTC 1/SC 42 on AI, has contributed to the publication of the following:

- ISO/IEC TR 24030: 2021 Information Technology – Artificial Intelligence (AI) – Use Cases ●●●
- Singapore Standards TR 99: 2021 Artificial intelligence (AI) security – Guidance for assessing and defending against AI security threats ●●●

Other works include the Second Edition of the Model AI Governance Framework (Model Framework). It spotlights governance practices in companies such as Google and Microsoft, and shares how they have benefited from responsibly using AI. ●●●

EXPLORE

Egypt Adopts Singapore's AIAP and AI4E To Upskill Nation ●●●

INTERNATIONAL RECOGNITION FOR OUR AI RESEARCHERS

Singapore is getting ahead in the AI race. The Global AI Index 2023 ranked us No. 3 (after the US and China) out of 62 countries. Meanwhile, here's a look at the researchers whose contributions have gained attention and accolades.



Prof Wynne Hsu's AI in Health Grand Challenge project, which proposes solutions to stop or slow progression of diseases such as diabetes, was featured in the American Diabetes Association 81st Scientific Sessions (25-29 June 2021) Thought Leadership Film Series. Prof Hsu is the Provost's Chair Professor at the Department of Computer Science, School of Computing, NUS ●●●



Prof Miao Chun Yan, President's Chair Professor & Chair, School of Computer Science & Engineering, NTU, and her team received during the IAAI (Innovative Applications of Artificial Intelligence (IAAI) conference in 2020 an IAAI-20 Deployed Application Award. Her AI in Health Grand Challenge put forward an AI-assisted 3H Care (A3C) system that can alert medical professionals to signs of pre-chronic diseases ●●●



Prof Ooi Beng Chin and his team proffered for AI in Health Grand Challenge using technology to, among other functions, enable precise nutrient analysis and preventive advice for patients. Their deep-learning platform Apache Singa was Southeast Asia's first software tool ranked among top 300 projects by Apache Software Foundation and garnered extensive global coverage as a Top-Level Project. Prof Ooi is the Lee Kong Chian Centennial Professor at the Department of Computer Science, School of Computing, NUS ●●●



Prof David Hsu, whose accolades include 2022 IJCAI-JAIR Best Paper Prize (International Journal of Artificial Intelligence), and 2021 Test of Time Award (Robotics Science and Systems)



Dr Kuldeep Meel, who was named among AI's 10 To Watch list by the Institute of Electrical and Electronics Engineers (IEEE) Intelligent Systems in 2020. He has also won several competitions in constraint programming



Dr Zhang Hanwang, who was presented with a Young Scientist Award 2021 for his pioneering theory on what and how artificial intelligence learns and where this knowledge can be transferred. Also, among AI's 10 To Watch list by IEEE Intelligent Systems in 2020







