



CREATE
Campus for Research Excellence And Technological Enterprise



France's CNRS teams up with A*STAR, NTU and NUS to launch new S\$56 million hybrid artificial intelligence programme

More than 2 organisations and 18 universities from both countries involved in the programme

A new S\$56 million Hybrid Artificial Intelligence (HAI) programme has been launched through an international collaboration involving the French National Centre for Scientific Research (CNRS), the Agency for Science, Technology and Research (A*STAR), Nanyang Technological University, Singapore (NTU) and the National University of Singapore (NUS),

Known as the **DesCartes Programme** and led by Francisco Chinesta, it will develop solutions that support the creation of “Smart Cities”. This includes developing hybrid AI methods that aim to enhance real-time decision-making in urban-critical systems, with a focus on individuals and society at large. The five-year programme will also adopt a holistic and multidisciplinary approach that combines AI with existing subject-based models from physics and engineering.

Funded by the National Research Foundation, Singapore (NRF), with contributions from participating partners, the innovations developed from the collaboration will support Singapore's Smart Nation objectives and its ongoing digital transformation efforts. Based in Singapore at the Campus for Research Excellence and Technological Enterprise (CREATE), the DesCartes Programme will be hosted by CNRS@CREATE and will tap on the research expertise of the CNRS, A*STAR, 18 universities from both Singapore¹ and France² and on the application expertise of 5 companies³.

Baillargeat Dominique, Director of CNRS@CREATE, said, “The primary objective of the DesCartes Programme is decision-making in “critical urban systems”, which is one of the many key challenges related to the “smart city” concept that many societies are striving towards. The CNRS has made AI and its applications one of its priorities, especially nurturing international partnerships. This is one way to extend the research conducted at Interdisciplinary Institutes of Artificial Intelligence localised in France, and to expand one of its components to include Singapore.”

Professor Lam Khin Yong, NTU Senior Vice President (Research), said, “NTU's partnership in this bilateral research agreement provides our scientists with a valuable platform to engage their counterparts in renowned French research institutions and universities, while allowing the partnership to leverage NTU's strengths in Engineering, AI and Social Sciences. This collaboration also signals NTU's commitment to Singapore's Smart Nation drive, which is in line with the NTU 2025 strategic plan that aims to accelerate the translation of research discoveries into innovation for the benefit of mankind.”

Professor Chen Tsuhan, NUS Deputy President (Research and Technology), said, “NUS is very excited to be a partner of the DesCartes Programme. We look forward to contributing our research strengths that are aligned with the Research, Innovation and Enterprise 2025 Plan, such as AI, intelligent modelling, analytics and cybersecurity to advance trusted decision-making for crucial systems like electricity networks, smart buildings, and future transportation networks. By bringing together the best

¹ NTU, NUS, Singapore University of Technology and Design, Singapore University of Social Sciences, and Singapore Management University.

² Université Paris-Saclay, École Normale Supérieure-Paris-Saclay, Université Toulouse III - Paul Sabatier, Université Lyon III - Jean Moulin, Université Côte d'Azur, Université de Bordeaux, École Nationale de l'Aviation Civile, Paris Sciences & Lettres, Université de Strasbourg, Arts et Métiers, Université Grenoble Alpes, INP Grenoble and INP ENSEEIHT.

³ ARIA, CETIM, EDF Lab Singapore, ESI Group and Thales & Thales Solution Asia.



researchers from Singapore and France, I am confident that we can generate a comprehensive range of innovative solutions to enable smart cities of the future.”

Professor Alfred Huan, Assistant Chief Executive, Science and Engineering Research Council, A*STAR, said, “A*STAR looks forward to bringing our multidisciplinary AI capabilities to this partnership, working together with the Singapore R&D ecosystem and researchers from France to achieve breakthroughs in urban solutions and smart city infrastructures. Collaboration is key to translating innovative R&D into positive outcomes for societies of the future.”

From optimising the electricity network to managing traffic for delivery drones

First unveiled at the second meeting of the France-Singapore Joint Committee on Science and Innovation (JCSI) held virtually on 24 June 2021, the DesCartes Programme will ride on the strong AI research collaborations between Singapore and France. It will focus on four areas – data and its applications ; verifiable and explicable AI; natural language processing; and human-machine/AI interaction. It will also explore key emerging areas that will support the creation of Smart Cities.

For example, the solutions developed could enhance urban mobility and energy management systems, or to anticipate the needs of future transportation networks, intelligent industries, and smart buildings. This includes creating urban systems that will be capable of analysing data on the population's use of services to further optimise and enhance them.

“For instance, we intend to develop solutions that optimise supply with demand in the electricity network or relieve traffic for drone taxis or delivery drones, in addition to developing smart predictive maintenance applied to industrial tools,” Baillargeat points out.

The DesCartes Programme will also recruit some 30 PhD students, 50 postdoctoral fellows, and over 80 other academics and researchers from both countries, to support the development of solutions and innovations. Some of the French academics will be based in Singapore for long-term stays that will be supported under the programme.

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About CNRS

The French National Center for Scientific Research is one of the most recognized and renowned public research institutions in the world. For more than 80 years, it has continued to attract talent at the highest level and to nurture multi-disciplinary and interdisciplinary research projects at the national, European and international levels. Geared towards the public interest, it contributes to the scientific, economic, social and cultural progress of France. The CNRS is above all 32,000 women and men, more than 1,000 laboratories in partnership with universities and other higher education institutions bringing together more than 120,000 employees and 200 professions that advance knowledge by exploring the living world, matter, the Universe, and the functioning of human societies. The CNRS ensures that this mission is carried out in compliance with ethical rules and with a commitment to professional equality. The close relationship it establishes between its research missions and the transfer of acquired knowledge to the public makes it today a key player in innovation in France and around the world. Partnerships with companies are at the heart of its technology transfer policy, and the start-ups that have emerged from CNRS laboratories bear witness to the economic potential of its research. The CNRS provides also access to research findings and data, and this sharing of knowledge targets many audiences: scientific communities, the media, decision-makers, economic players and the general public.

For more information: www.cnrs.fr

About Nanyang Technological University, Singapore

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Humanities, Arts, & Social Sciences, and Graduate colleges. It also has a medical school, the Lee Kong Chian School of Medicine, established jointly with Imperial College London.

NTU is also home to world-class autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Ranked amongst the world's top universities by QS, NTU has also been named the world's top young university for the past seven years. The University's main campus is frequently listed among the Top 15 most beautiful university campuses in the world and has 57 Green Mark-certified (equivalent to LEED-certified) buildings, of which 95% are certified Green Mark Platinum. Apart from its main campus, NTU also has a campus in Novena, Singapore's healthcare district.

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

For more information, visit www.ntu.edu.sg

About National University of Singapore (NUS)

The National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education, research and entrepreneurship, with a focus on Asian perspectives and expertise. We have 17 faculties across three campuses in Singapore, with more than 40,000 students from 100 countries enriching our vibrant and diverse campus community. We have also established our NUS Overseas Colleges programme in more than 15 cities around the world.

Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant



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to Asia and the world. Researchers in our faculties, 30 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity. For more information on NUS, please visit www.nus.edu.sg.

About the Agency for Science, Technology and Research (A*STAR)

The Agency for Science, Technology and Research (A*STAR) is Singapore's lead public sector R&D agency. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit the economy and society. As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by improving societal outcomes in healthcare, urban living, and sustainability. A*STAR plays a key role in nurturing scientific talent and leaders for the wider research community and industry. A*STAR's R&D activities span biomedical sciences to physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit www.a-star.edu.sg.

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