NEWS RELEASE

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NTU Singapore and UAE tech firm Kintsugi debut at the inaugural Abu Dhabi Autonomous Racing League

Nanyang Technological University, Singapore (NTU Singapore) and United Arab Emirates (UAE) tech firm **Kintsugi** debuted at the inaugural **Abu Dhabi Autonomous Racing League (A2RL)** held at the iconic Yas Marina Circuit, a race track renowned in Formula 1 racing.

As the only representative from Southeast Asia, NTU Singapore showcased its technological expertise in Artificial Intelligence (AI) and autonomous driving on a global stage, competing against top-tier institutions and organisations from all over the world, including the USA, Germany, Italy, the UAE, China, and Hungary.

The A2RL, which aims to inspire students and promote STEM (Science, Technology, Engineering, and Mathematics) subjects in the UAE and beyond, featured the world's first race of driverless Dallara Super Formula SF23 cars, on one of the most technically challenging Formula 1 racetracks. This event marks a significant milestone in motorsports, with vehicles operating without manual controls and relying solely on advanced software algorithms for navigation and racing tactics.

The league also aims to spur further innovation in autonomous vehicle technologies and inspire the future landscape of racing and transportation. To join the league, Kintsugi's aviation and space technology subsidiary, **Autocraft**, signed a research collaboration agreement with NTU and formed a joint team called *Kinetiz*.

NTU Singapore Vice President (Innovation and Entrepreneurship) Professor Louis Phee said: "Coming in 6th for the pre-qualifying round in this highly competitive environment is a milestone for both Singapore and NTU, competing WITH the world's best organisations in AI and autonomous driving. Our joint team made a valiant effort in this inaugural AI motorsports race. We have learned much from this challenge, and with our combined strengths in computer science and engineering disciplines, we are determined to aim for a spot on the podium in next year's race."

Team Principal of Kinetiz and Kintsugi's Vice President Tareq Albannay, also highlighted the synergistic spirit of the partnership: "Choosing NTU Singapore as our partner was a strategic decision, as the University had a strong track record in autonomous transportation technologies and engineering capabilities. Together, we are pushing the boundaries of AI and motorsports, integrating academic research with industrial prowess to innovate and lead the world."

Pioneering the technologies for the race were **Associate Professor Holden Li** and **Associate Professor Lyu Chen** from **NTU's School of Mechanical and Aerospace Engineering**, in close collaboration with **Mr Ong Chee Kiong, Programme Director of Technology R&D, Kintsugi**.

Together, the joint team of over 28 scientists and engineers initiated two parallel development approaches for this competition, focusing on Modular Planning and Control, and AI-Enabled End-to-End Autonomous Driving capabilities.

The sophisticated AI algorithms utilised Lidar, IMU (Inertial Measurement Units), and GPS technologies to perform sensor fusion at exceptionally high speeds without exceeding the hardware capabilities of the autonomous race car.

This process also merged various data points to create a precise, real-time map of the car’s environment, enabling the AI to predict and optimise its racing path. The AI algorithms will then control the steering, braking and acceleration of the vehicle to maintain its trajectory on the optimised path.

A critical component of the AI’s training regimen included deep reinforcement learning, which allowed the AI to learn from mistakes experienced in a simulation environment. By continuously refining its strategies through thousands of virtual repetitions and learning from the behaviours of experienced race car drivers, the AI effectively learned optimal vehicle control and race tactics.

This development and testing phase which spanned five months, leveraged the combined expertise from NTU and Autocraft to see the successful integration of a fully autonomous race car.

The learnings from this competition will allow scientists and engineers working on autonomous vehicles to have a deeper understanding of developing advanced AI systems. The technologies could also pave the way for practical applications in real life which can be adapted for smart vehicles, traffic prediction, emergency braking and steering systems, which can help to enhance safety for all road users.

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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, Medicine, Humanities, Arts, & Social Sciences, and Graduate colleges.

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

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.

Ranked amongst the world's top universities, the University's main campus is also frequently listed among the world's most beautiful. Known for its sustainability, NTU has achieved 100% Green Mark Platinum certification for all its eligible building projects. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

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