MEDIA RELEASE
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PSA AND A*STAR COLLABORATE ON SMART, SCALABLE SOLUTIONS FOR MANAGING AUTOMATED GUIDED VEHICLE (AGV) FLEETS IN PREPARATION FOR TUAS PORT

Advanced high performance computing technology will enable AGVs to automate movements of containers safely and systematically at the port

SINGAPORE – PSA Singapore and the Agency for Science, Technology and Research's (A*STAR's) Institute of High Performance Computing (IHPC) have signed a research collaboration agreement to jointly develop a large-scale fleet management solution for automated guided vehicles (AGVs) to move containers efficiently and securely in the Next Generation Port at Tuas. Tuas Port will be the largest fully automated container terminal in a single location with an annual handling capacity of 65 million TEUs[1].

AGVs currently play a significant role in automating yard and wharf operations for the Tuas Port, due to their versatility and maneuverability in picking up and transporting containers. These driverless electric vehicles are also greener and more sustainable compared to using diesel prime movers, reducing carbon emissions by about 50 per cent. The fleet of AGVs is expected to increase in tandem with large-scale port operations.

To meet the demands of a larger AGV fleet, PSA requires an intelligent, advanced fleet management system that is responsive and can handle the computational load. This new fleet management solution for AGV operations is also expected to achieve significant cost savings through the reduction of infrastructure and operational costs. PSA and A*STAR's IHPC will co-develop advanced automation and digitalisation solutions that can address these needs.

IHPC will contribute its expertise in advanced high performance computing technologies and algorithms to develop accelerated solutions for large-scale fleet management of AGVs. PSA will contribute its expertise in the design of algorithms, provide a simulation platform to conduct the proof of concept, as well as furnish its wealth of experience and

[1] *Source: https://www.straitstimes.com/singapore/tuas-port-to-be-worlds-largest-fully-automated-terminal-when-completed-in-2040-pm-lee TEUs: Twenty-foot Equivalent Unit is an exact unit of measurement used to determine cargo capacity for container ships and terminals.*

domain knowledge in the development and operation of the existing AGV fleet management system.

The research collaboration also includes the development of innovative techniques that will allow a scalable design with multiple AGVs coordinating seamlessly and at the same time, ensuring operational safety. Upon successful development, PSA will look to apply the smart solutions to future enhanced fleet management systems as operations in Tuas Port gradually scale up, while the addition of new technologies such as 5G will further enhance computation performance.

“PSA Singapore is pleased to partner IHPC in co-creating innovative and robust solutions to manage our large fleet of smart and green AGVs. We look forward to leveraging the diversity of ideas and thought to drive technological innovations which will enhance our operational agility and scalability. This collaboration will bring us closer to our vision of developing an intelligent, resilient and sustainable port of the future,” said Mr Ong Kim Pong, Regional CEO Southeast Asia, PSA International.

“A*STAR is excited to collaborate with PSA to co-develop smart solutions for Singapore’s Next Generation Port by enhancing the scalability and efficiency of terminal operations. This partnership demonstrates A*STAR’s contribution to the maritime industry by applying our research capabilities in high performance computing, and modelling and simulation to create intelligent and scalable technological solutions,” said Dr Lim Keng Hui, Executive Director, A*STAR’s IHPC.

Mr Kenneth Lim, Assistant Chief Executive (Industry) of MPA said, “The development of large-scale AGV fleet management solution is a step towards realising MPA’s vision to build a smart, next-generation port that increases productivity, while improving safety and security. MPA is pleased to support this initiative which is funded under the Maritime Transformation Programme (MTP). One of the key vehicles under the Sea Transport Industry Transformation Map, MTP co-funds projects to develop new capabilities or technologies that have high potential for industry application.”

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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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About A*STAR's Institute of High Performance Computing (IHPC)

A*STAR's Institute of High Performance Computing (IHPC) was established in August 1998 to provide leadership in high performance computing as a strategic resource for scientific inquiry and industry development. It seeks to power discoveries through advanced methodologies, techniques and new tools in modelling, simulation and artificial intelligence.

Its core research areas are in the realm of complex-coupled systems, mechanics and fluid dynamics, large-scale systems, digital modelling, adaptive and collaborative computing, data mining and analysis, computational electronics and electromagnetics, computational materials science and chemistry.

For more information on IHPC, please visit www.a-star.edu.sg/ihpc.

About PSA Corporation Ltd (PSA)

PSA Singapore operates the world's largest container transhipment hub in Singapore, handling 37.2 million TEUs of containers in 2021. With connections to 600 ports globally, shippers have access to daily sailings to every major port in the world, operating 24/7 all year round. Beyond port operations, PSA also offers cargo solutions to customers operating in advanced manufacturing, cold chain, e-commerce, and energy & chemicals. This value adding service is enabled by CALISTA™, a digital platform that facilitates trade and helps shippers to better manage their physical movement of goods, trade financing and compliance. Visit us at www.singaporepsa.com.