brainhack

DSTA
Defence Science & Technology Agency

Fact Sheet

BRAINHACK

BrainHack 2024 was organised by the Defence Science and Technology Agency (DSTA) from 1 May to 13 June 2024 to generate interest in cybersecurity, artificial intelligence, space technology, extended reality, fake news detection and app development among students in Secondary Schools, Junior Colleges (JC), Integrated Programme (IP) Schools, Institutes of Technical Education (ITE), Polytechnics, as well as Universities.

Incepted in 2019, this year's annual learning festival saw more than 4,000 students from some 109 schools pick up knowledge across its various components: Cyber Defenders Discovery Camp (CDDC), the Today I Learned – Artificial Intelligence (TIL-AI) Camp, SpaceCube, XRperience, SeeTrue, CODE_EXP, as well as an interactive Tech Showcase.

Cyber Defenders Discovery Camp (CDDC)

CDDC offers a comprehensive exploration of cybersecurity self-learning modules with hands-on exercises to equip participants with essential skills and problem-solving capability to defend against online attacks. Teams competed in a 30-hour virtual qualifier Capture-The-Flag competition where the final stretch of the competition saw the teams duke it out in a mixture of physical and virtual challenges on 13 June.

Today I Learned – Artificial Intelligence (TIL-AI) Camp

The TIL-AI Camp offers participants an immersive learning experience centered around AI and autonomous robotics. The participants tackled real-world challenges by developing AI solutions capable of interpreting spoken commands, and translating

them into precise actions that will accurately identify visual targets to safeguard against aerial threats.

Throughout the camp, participants engaged in workshops and self-directed courses, enhancing their AI skillsets. This exciting journey culminated in a physical final showdown on 12-13 June where teams deployed their AI algorithms into an air defence turret system to effectively neutralise targets.

CODE_EXP

Ideate. Design. Code. These are essential skills that participants acquired in their mobile app development journey. Through hands-on learning workshops, participants delved into programming, UI/UX design and the nuances of mobile app development. In preparation for the fast-paced technology industry, teams engaged in a hackathon to develop a minimum viable product, navigating the entire software development lifecycle under time constraints. They pitched their creations and refined their skills during the physical finals to compete for the winning prize.

SeeTrue

SeeTrue aims to equip participants with techniques to detect fake news and spot misinformation. Through engaging talks and hackathon, they not only learnt the basics of image generation, but also unleashed their wits and used open-source tools to conquer real-world misinformation challenges.

SpaceCube

SpaceCube offers participants an immersive workshop focusing on space technology and data applications. Through a combination of on-site training, site visits and expert insights, participants gained a deep understanding of satellite systems, spaceborne sensors and the generation of space data for real-world applications. A highlight of the programme was the opportunity to learn from Italian astronaut Brigadier General Roberto Vittori. Teams also engaged in a competitive hackathon from 12-13 June, where they applied their newfound knowledge and skills to tackle space-related challenges.

XRperience

Under XRperience, participants explored technologies in virtual, augmented and mixed reality. They learnt to develop immersive experiences, network with experts and learn skillsets from basic XR development to advanced XR concepts. Participants pitched solutions that they have built and showcase its feasibility, innovation and technical implementation during the finals from 12-13 June.

Tech Showcase

Tech Showcase at BrainHack featured interactive exhibits and engaging activities spotlighting how DSTA equips Singapore with the latest defence technologies.

LiDAR Obstacle Course	Participants teamed up to escape an obstacle course without being detected by the LiDAR (Light Detection and Ranging) system. Through this, participants experienced the capability of LiDAR sensors for tracking objects in urban environments and its applications in security operations.
Drone Challenges	Participants learnt how to operate drones in a low-stakes environment. Intermediate and advanced participants could choose to compete against other opponents in timed challenges and attempt autonomous navigation through a maze. Through this, participants better understood the intricacies of drone technology and the challenges in deploying such devices in a military context.
Admiral's Battlegrounds	Participants got to control a ship to complete a team mission in a naval warfare game. The game map was patrolled by enemy ships, and the team's mission was to make use of the ship's capabilities to locate and identify the enemies, chart out a safe route, and escort a VIP to the end goal.

	Through this, the participants explored how E-Sports concepts and gamification technologies are leveraged in a naval warfare tactical trainer.
Counter-drone Workshop	Participants developed their own counter-drone systems and competed in teams of 3 in a half-day workshop. Through the gameplay, participants gained insights into how critical assets are protected from aerial threats.
Naval C2 Simulation	Participants controlled multiple maritime robots through a Command & Control (C2) system. Through the gameplay, participants learnt how to navigate the challenges of controlling multiple robots simultaneously and the technology required to improve a robotics C2 system.