14 June 2019

Fact Sheet

BRAINHACK

BrainHack was organised by the Defence Science and Technology Agency (DSTA) from 13 to 14 June 2019 to generate interest in artificial intelligence (AI) and cybersecurity among students in Secondary Schools, Junior Colleges (JC), Integrated Programme (IP) Schools, Polytechnics, Universities and Institutes of Technical Education (ITE).

The inaugural BrainHack saw more than 1,500 students pick up cybersecurity and AI knowledge across its various components: Cyber Defenders Discovery Camp, the Today I Learned (TIL) – AI Camp, and a Tech Showcase.

Today I Learned (TIL) – AI Camp

The TIL – AI Camp provided exposure to some 270 students in AI, machine and deep learning through TIL. To prepare participants on the concepts for data preparation and processing, AI upskilling workshops were conducted on 3 and 4 June at DSTA. Participants learnt to set up deep learning models and methods to improve the accuracy of image detection and classification algorithms. They trained AI models to correctly identify a specified pose with image datasets of people in various poses.
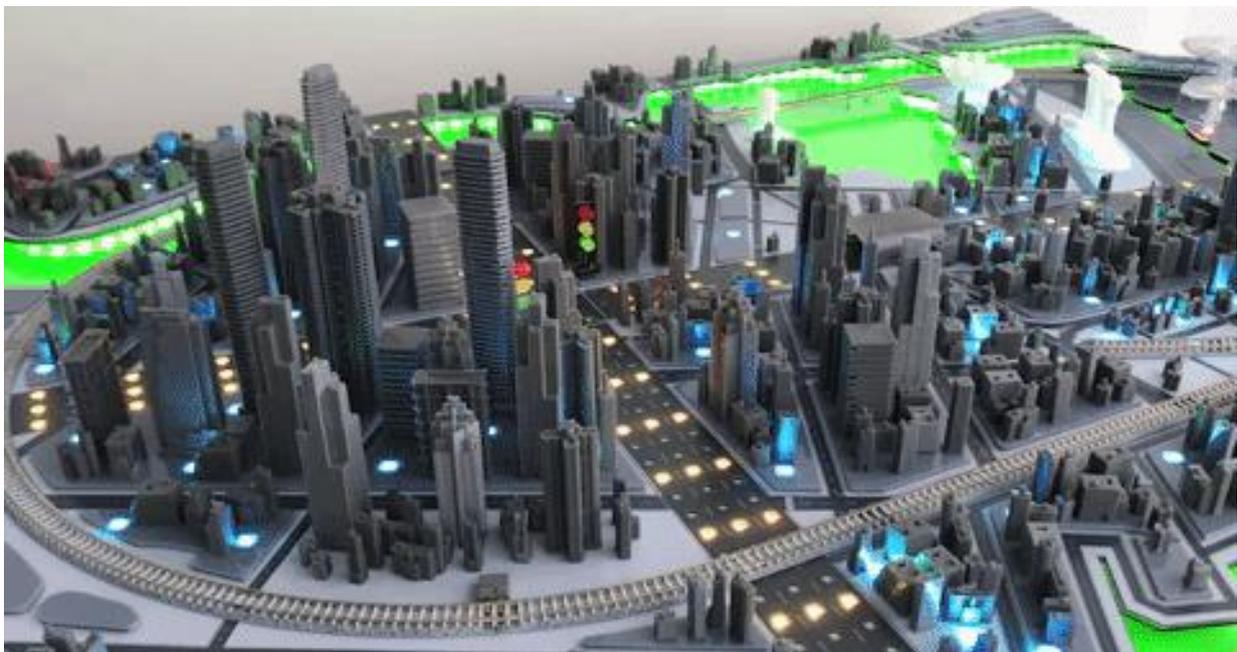
During the competition on 13 and 14 June, additional datasets were released and teams were challenged to augment and improve the accuracy of their models with relevant data and modelling techniques. The camp wrapped up with an exciting pitch by the top five teams in each category to determine the most innovative solutions.

Cyber Defenders Discovery Camp

About 860 students were trained in fundamental cybersecurity techniques from 8 to 28 May. DSTA curated a comprehensive three-week online training programme on topics such as penetration testing, digital forensics, and web application security. A wide range of guided modules and hands-on practice allowed participants to learn at their own pace according to their skill levels.

Thereafter, participants applied their knowledge and skills at an online qualifier from 31 May to 2 June, where teams had 48 hours to solve challenges and quizzes that put their skills and knowledge to test. These activities culminated in an on-site competition on 14 June, where 470 students applied their skills and ingenuity in team competition. Six international teams who performed well in other cyber competitions also joined the finals.

This year featured a new competition focusing on physical-cyber links, including the addition of a mini Smart City diorama. Participants had to complete a fixed number of challenges in each ring to progress to the innermost rings containing special cyber-physical challenges. When cleared, these would trigger a response in the diorama. The challenges were a mix of "Red team" challenges which required them to actively detect and test vulnerabilities, and "Blue team" challenges which were more analytical such as incident response, digital forensics or security risk auditing.

Tech Showcase

More than 1,000 students and camp participants got up close with a diverse range of cutting-edge technologies and applications at the Tech Showcase on 13 and 14 June. Through their interactions with DSTA engineers and partners manning the booths, participants gained insights into the close relationship between cyber and AI, and even tried out real-world applications in a unique gamified learning experience. Exhibit booths were livened up with an eSports theme to keep activities engaging, fun and informative. DSTA also brought together various industry partners to provide students with a deeper appreciation of emerging technologies.

List of interactive booth challenges:

Missions Impossible	Plan missions with virtual fleets at your fingertips
Double Helix	Use AI to quickly draw relationships and meaning from text
Malware Madness	Sieve out malicious web domains and try to outwit an automated detector
Shoot 'Em Up	Command, control and communicate – compete against AI and beat it in a 1v1 shoot out
Whack-A-Mole	Try and fool the AI into thinking you are someone else
Etches Sketches	Turn sketches and doodles into artistic masterpieces
Eye in the Sky	Interact with various drones and appreciate the importance of cybersecurity while defending against weakly protected drones
Lightcycles	Explore Bluetooth security in e-scooters
Cyber Siege	Meet a robot that responds to gestures
Guardians of the Sea	Get on board with AR/VR-enabled training missions for Navy vessels
Digital Fortress	Go on a journey in virtual space, interact with the virtual concierge and explore how to make homes smart
Automania	Watch and learn to fend off attempts to gain control of an autonomous car

To broaden their perspectives, participants also had the opportunity to attend talks by various AI industry experts on 13 and 14 June to hear about their experiences and applications of AI beyond defence.

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About Defence Science and Technology Agency

The Defence Science and Technology Agency (DSTA), a statutory board under Singapore's Ministry of Defence, exploits science and technology, and provides technological and engineering support for Singapore's defence and security. It delivers leading-edge technological solutions to the Singapore Armed Forces (SAF) by tapping the best technologies and fostering an environment of innovation for defence applications. Its role spans the entire spectrum of capability planning, development, and sustainment of weapon systems throughout their life cycle to ensure that the SAF continue to be a formidable fighting force.

Visit www.dsta.gov.sg for more information.