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News Release

STUDENTS SHOWCASE INNOVATIVE IDEAS FOR DEFENCE TECH

Combating fake online news, securing digital transactions, harnessing robotics for explosives disposal and disaster relief, or experimenting with origami paper parachutes – these were some scenarios where students unleashed their creativity in devising technological solutions, as part of the Young Defence Scientists Programme (YDSP) organised by the Defence Science and Technology Agency (DSTA) and DSO National Laboratories (DSO).

The YDSP focuses on practical and immersive learning beyond the classroom, equipping students with hands-on experience in the vast applications of defence science and technology. In the last 12 months, more than 350 students across 19 schools participated in project attachments, lectures and laboratory sessions as part of the Research@YDSP, YDSP Science and Technology camps and YDSP World of Science (WOS) programmes. They had the opportunity to learn concepts and explore applications of the latest technological advances, ranging from artificial intelligence, cryptography, the Internet of Things and more.

Speaking at the YDSP Congress earlier today, Senior Minister of State for Defence Mr Heng Chee How spoke about the important role the Defence Technology Community (DTC) plays in Singapore's defence. "Our Defence Technology Community (DTC), comprising some 5,000 scientists and engineers across the Ministry of Defence (MINDEF), Defence Science and Technology Agency (DSTA) and DSO National Laboratories (DSO), has been instrumental in turning our constraints into opportunities and delivering innovative solutions that will meet our needs and overcome our constraints," he said. Mr Heng also highlighted the value that YDSP

brings to the DTC. “YDSP has been a meaningful platform for nurturing the next generation of young defence scientists and engineers... I am confident that your passion and desire to challenge and stretch the limits of science and technology will one day allow you to play a part to shape Singapore’s exciting future,” he said

In total, over 50 innovative ideas and projects were showcased at the YDSP Congress. Among them were two Research@YDSP projects that also achieved Gold awards at the Singapore Science and Engineering Fair (SSEF) 2019. The bright minds behind these creations will represent Singapore at the Intel International Science and Engineering Fair (Intel ISEF) – regarded by students as the “Olympics” of youth science competitions – in May 2019.

Tackling the hot-button issue of fake news, Liu Haohui from Raffles Institution aimed to provide a reliable means of verifying the accuracy of online news. Leveraging open-source datasets of real and fake news articles, she conducted research on the effectiveness of various data analytics techniques and models in uncovering misinformation. Going a step further, she coded and trained multiple machines and deep learning models and even “stacked” several models to make them more accurate at detecting unreliable news.

Elaborating on her Research@YDSP experience, Haohui said: “It was very exciting to have hands-on experience and apply data analytics techniques to a project that can potentially strengthen our nation’s security! As fake news is something that is very rampant right now, I want to further develop my prototype into a mobile application or even a website to guide Singaporeans to make more informed decisions.”

Her mentor, Ryan Tarn, a Senior Engineer at DSTA’s National Security Programme Centre, shared: “Haohui’s project has many real life benefits and is just one of the many possibilities of how data analytics can be used in the context of national security. Haohui already had prior knowledge in coding and is a fast learner, so I was able to introduce more advanced techniques for her to explore.”

Another SSEF Gold winner is the origami paper parachute project by Natalie Elizabeth Yam from Anglo-Chinese School (Independent). The project explores the feasibility of

paper parachutes designed with various origami folding patterns to create a compact, self-deploying parachute suitable for disaster relief operations. She said: “As a first time participant, I really enjoyed the intellectual rigor of being introduced to new ideas and being challenged to apply what I learned. The experiences with my mentor and friends at DSO also made my research journey very meaningful.”

Her mentor, Joel Ho, a Guided Systems research engineer in DSO added: “Coincidentally, Natalie is my first mentee for YDSP and it was a breeze working with her on her project. She proposed many great ideas for the origami folds and parachute design. Overall I feel that YDSP is a great platform to keep the youths interested in Science, Technology, Engineering and Mathematics (STEM) through first-hand experiences in the world of defence research and development.”

In another Research@YDSP project, Wee Chun Hui from Victoria Junior College explored a novel method to enhance the safety of explosives disposal. She programmed a stereo camera and infrared sensor system to aid operators in controlling robotic arms with greater precision.

Winning teams from the YDSP Science and Technology camps also presented at the Congress. The winning team from the “Data Analytics” camp demonstrated their model of a smart home, and the winning team from the “Robotics” camp demonstrated their disaster relief robot prototype.

WOS is a series of informative lectures and laboratory sessions for students to learn more about advanced science topics such as Artificial Intelligence and electromagnetics. Samuel Chua from Dunman High School and his schoolmate Cheryl Shua Yee En, took part in the newly revamped WOS module “Sensors, reducing the fog of war”.

At the Congress, Mr Heng also presented 29 YDSP Scholarships and 30 DSTA Junior College Scholarships to students for their outstanding academic and co-curricular achievements. The event was attended by 550 students, principals, teachers and members of the DTC.

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About Defence Science and Technology Agency

The Defence Science and Technology Agency, or DSTA in short, (国防科技局), is a statutory board set up under the Ministry of Defence (MINDEF). It implements defence technology plans, acquires defence material and develops defence infrastructure for MINDEF.

DSTA provides leading-edge technological solutions to the Singapore Armed Forces (SAF) by tapping the best technologies and fostering an environment of creativity and innovation for defence applications. It also builds up a strong community of engineers and scientists from the universities, research institutes, government and industry to serve the defence needs of the nation. For more information, please visit www.dsta.gov.sg.

About DSO National Laboratories

DSO National Laboratories (DSO, 国防科技研究院) is Singapore's national defence research and development organisation. It undertakes indigenous development of advanced defence and weapon systems that provide the SAF with the superior technological edge in the battlefield. While its primary focus is to support the SAF, DSO also extends its defence R&D capabilities to support homeland security.

With more than 1,500 research scientists and engineers, DSO investigates emerging technologies, matures promising ones and integrates them into innovative system concepts to meet Singapore's defence and security needs. For more information, please visit www.dso.org.sg.