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News Release

UNLEASH STUDENTS' CREATIVITY TO SOLVE REAL-LIFE CHALLENGES THROUGH THE YOUNG DEFENCE SCIENTISTS PROGRAMME

How can deep learning algorithms be applied to better enable the deaf community to integrate into society for a more inclusive Singapore? Can gamification be introduced into marksmanship simulator training to enhance effectiveness and engagement? These are but two of the many interesting, real-life challenges that students tackled as part of the Young Defence Scientists Programme (YDSP) organised by the Defence Science and Technology Agency (DSTA) and DSO National Laboratories (DSO).

Established in 1992, the YDSP nurtures students' passion for science and technology, and provides them insights into the careers of professionals in the defence technology community through an out-of-classroom, immersive learning experience with Singapore's top defence engineers, software developers, cybersecurity experts, and research scientists. As technologies become increasingly digital and dual-use for both commercial and military applications, the YDSP offers students an opportunity to learn more about the emerging technologies that will impact society, the economy and defence.

Speaking at the YDSP Congress, DSTA's Chief Executive, Mr Mervyn Tan said, "As we continue to face an ever-evolving security landscape, the need for defence scientists and engineers has never been greater. The innovations of our scientists and engineers prepare Singapore for the challenges we may face tomorrow. Platforms like the YDSP are opportunities for bright young minds to develop their interests in technology and inspire them to be Singapore's next generation of defence scientists and engineers."

In 2022, over 380 students across 19 schools participated in various initiatives such as Research@YDSP, YDSP Science and Technology Camps and the YDSP World of Science, which involved activities such as project attachments, lectures and laboratory sessions at DSTA and DSO (see YDSP Factsheet for more details). This culminated in the YDSP Congress held on 19 April 2023, which celebrated the success of all YDSP activities over the past year, showcased the learning experience and projects of the participants, as well as congratulated the students who received YDSP scholarships and DSTA Junior College scholarships. The event was graced by Senior Minister of State for Defence, Mr Heng Chee How.

In total, over 50 innovative ideas and projects were showcased at this year's physical YDSP Congress, after three years running in virtual mode. Among them was a Research@YDSP project with DSO that won a Gold award at Singapore Science and Engineering Fair 2023. Their project uses deep learning to not only interpret and translate sign language to speech, but also incorporates emotion into machine-generated speech. This automated speech synthesis from a sign language model is a game-changer for the use of deep learning. It also demonstrates how technology can be a force for good, as it can be used as a communication aid to enhance mutual understanding between hearing and deaf individuals, for a more inclusive Singapore.

The students behind this project, Mirdhini Shri Rajaram and Ong Yu Xi, will be representing Singapore at the upcoming International Science and Engineering Fair, which is the world's largest pre-college STEM competition. Sharing more on their work, Yu Xi said, "This project has revealed to us how much more we can learn (from Research@YDSP) about the field of artificial intelligence and its impacts. With the guidance of our mentor, we are eager to learn more and use our knowledge to develop products that help make a positive change!"

Another Research@YDSP project by students Adele Lim and Chin Jen Bin with DSTA looked at how gamification can potentially be introduced to the Singapore Army's Individual Marksmanship Trainer (IMT) simulator. By applying the Design Innovation methodology, the students explored various ways gamification can be

applied to enhance the training's effectiveness in terms of competency and safety, while also making it more engaging for trainees.

"Besides having a huge interest in research, I have always been curious about defence science and technology. YDSP was thus the best of both worlds," shared Adele. "My internship was eye-opening and meaningful – I was introduced to design innovation, refined my research skills, and learnt to be open-minded and adaptable. Getting behind-the-scenes on DSTA's role in defending Singapore has also further piqued my interest in this field," she added.

At the YDSP Congress, Mr Heng presented 30 YDSP Scholarships and 35 DSTA Junior College Scholarships to students in recognition of their outstanding academic and co-curricular achievements. The Congress was attended by 400 students, parents, principals, teachers, and members of the defence technology community.

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With more than 1,600 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.

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