

SPEECH BY CHIEF EXECUTIVE, DEFENCE SCIENCE AND TECHNOLOGY AGENCY, MR MERVYN TAN, FOR THE YOUNG DEFENCE SCIENTISTS PROGRAMME CONGRESS 2023, ON 19 APRIL 2023, AT ORCHARD HOTEL

Board Members and Management of DSTA and DSO,

Principals and Teachers,

Parents and Students,

Ladies and Gentlemen,

1. A very good afternoon.
2. I am happy to be here in person with you at this year's Young Defence Scientists Programme Congress. For the past few years, this event was held virtually because of the COVID-19 pandemic.

This year, it gives me great joy to see so many bright young minds, face-to-face, gathered in one place, with a shared passion for science and technology.

Progress of the Young Defence Scientists Programme (YDSP)

3. Today, we are celebrating over 30 years of the Young Defence Scientists Programme, or YDSP for short. Organised by the Defence Science and Technology Agency (DSTA) and DSO National Laboratories (DSO), this programme started modestly, with contests and activities to offer a glimpse into the world of defence science and technology back in 1992. Over the past three decades, it has grown to become a signature platform for secondary school and junior college students to gain insights into how defence scientists and technologists apply evolving technologies to tackle real world security challenges.

4. In the past 12 months, more than 380 students from 19 schools participated in the various YDSP workshops, internships, and camps; gaining first-hand exposure to a wide range of technologies including aerodynamics, artificial intelligence (AI), robotics, and many more.
5. The lifting of COVID-19 safe management measures last year also allowed us to resume the physical conduct of various exciting activities. Research@YDSP, which is a four-month project attachment programme, had over 70 students working on some 40 defence-related projects with guidance from DSTA and DSO mentors. DSTA also held two YSDP Science & Technology Camps, which saw over 140 student participants. The first camp in June last year focused on the Internet-of-Things (IoT), where students learnt how to programme an IoT controller to carry out a wide range of functions.

During the second camp in December, students received a great boost in their understanding of autonomous unmanned ground vehicles, and got the chance to train their own unmanned vehicles. In addition, the YDSP World of Science, led by DSO, took learning out of the classroom for some 170 participants when it was held last June. Through exciting workshops and hands-on activities curated by DSO, participants got to experience real-world applications of STEM concepts like artificial intelligence, electromagnetics and cryptography. Participants also got the chance to learn from experts through field trips to places like Temasek Laboratories @ NUS and the NUS Satellite Technology and Research Centre (STAR). The YDSP Congress marks the culmination of all these activities and an opportunity for us to celebrate YDSP's achievements over the past year.

6. I am delighted that some of our YDSP student projects, under the mentorship of DSTA and DSO defence scientists, have been recognised and won awards at national competitions.
7. For example, two of our Research@YDSP students, Mirdhini Shri Rajaram and Ong Yu Xi, received Gold awards for their project with DSO at this year's Singapore Science and Engineering Fair (SSEF). They will be representing Singapore at the International Science and Engineering Fair later this year.

Mirdhini's and Yu Xi's project uses deep learning to not only interpret and translate sign language to speech, but also incorporates emotions into machine-generated speech. This project demonstrates how technology can be a force for good, as it improves communication between hearing and deaf individuals, for a more inclusive Singapore.

8. Separately, a team of four YDSP students, Matthew Chan, Faith Goh, Charmaine Lee and Cailin Mok, also received the Best Paper Award at the 8th International Researchers Club Conference on Science, Engineering and Technology 2022. This team, under the supervision of DSTA engineer Bryan Ng, developed a mobile app capable of detecting people efficiently at building windows, for the purposes of urban operations.
9. These achievements by our YDSP students are no small feat, and are testament to the teams' dedication, ingenuity and curiosity about the awesome potential of technology.

The Importance of Young Defence Scientists in the Future of Defence

10. Indeed, emerging technologies like AI bears much potential for military applications. Today, the digital domain is the new frontline.

This can be seen from the ongoing Russia-Ukraine conflict, where cyberweapons have been used to target various Ukrainian government organisations and banks, and civilians have used Telegram chatbots to share videos and locations of troops to provide open-source, real-time updates on the conflict. Recognising the growing importance of the digital domain in warfare, the SAF established its fourth service, the Digital and Intelligence Service (DIS) last year. This move is part of MINDEF/SAF's ongoing journey to keep pace with the rapidly evolving threat landscape, and to leverage emerging technologies to enhance operational effectiveness. The establishment of the DIS is one of many long-term investments so that the SAF can secure Singapore's peace and security in an increasingly volatile, complex and ambiguous environment.

11. 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. To foster deep learning, we continuously strive to find diverse opportunities for students to learn from experts in the field. Student engagement sessions were specially arranged in conjunction with the recent Singapore Defence Technology Summit (SDTS) hosted by DSTA, where over 40 eminent global tech leaders spoke on digital and dual-use technologies and the opportunities and threats presented by them. It is my hope that, through opportunities like these, young defence scientists like yourselves will continue to pursue your passion for science, technology, engineering and mathematics.

12. Many of our DSTA and DSO scientists and engineers started like you through the YDSP.

One example is Quek Yong Jian, who is currently an engineer at DSTA working on a combination of robotics, armoured vehicles and video analytics. Intrigued by the defence sector, Yong Jian joined the YDSP programme in 2011. He worked on a project which involved utilising microelectromechanical sensors for military operations. Besides getting his first taste of engineering work to solve real-life challenges, the YDSP experience gave Yong Jian a sense of purpose as he saw how his research could be applied to help soldiers on the ground. This motivated Yong Jian to apply for the DSTA scholarship and pursue a career in the Defence Technology Community. There are many more stories like Yong Jian's, which I hope would inspire you to take on the exciting challenge of shaping the future of Singapore's defence.

Conclusion

13. Finally, I would like to congratulate all the participants here for successfully completing your YDSP journey. The project booths showcase the fruits of your labour and the knowledge you have acquired. My congratulations to the YDSP and DSTA Junior College Scholarship recipients as well. I would also like to acknowledge every mentor, principal, teacher, and parent – thank you very much for your support and dedication in nurturing our next generation.
14. I wish all of you a fulfilling and enjoyable time exploring the project exhibitions, and I wish all YDSP participants success in your upcoming endeavours.
15. Thank you.