



SPEECH

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SPEECH BY SENIOR MINISTER OF STATE FOR DEFENCE, DR MOHAMAD MALIKI BIN OSMAN, AT THE YOUNG DEFENCE SCIENTISTS PROGRAMME CONGRESS 2018, AT ORCHARD HOTEL SINGAPORE, ON 16 APR 2018, 1500 HRS

Board Members and Management of DSTA and DSO,
Principals,
Teachers,
Parents,
Students,
Ladies and Gentlemen.

1. A very good afternoon.

2. It is really my pleasure to be here today. Two weeks ago, I was at the annual Singapore Amazing Flying Machine Competition, where young Singaporeans let their imaginations take flight by creating remarkable flying inventions. I think the creativity and spirit of innovation displayed by you and your peers today will be no different. This year marks the 12th successful edition of the Young Defence Scientists Programme (YDSP) Congress. Every year, without fail, many bright young minds like you stretch your imagination to invigorate this programme and excite everyone. Each year when I come to this event and engage these young minds, I feel very optimistic about our future – your passion, your desire to explore uncharted territories of Science and Technology, and your youth will bring innovation that is much needed for the future.

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Technological Advancements Are Changing Our World

3. We gather here today amidst exciting times in the field of Science and Technology. First, advancements in communications technologies have fundamentally changed our interactions. You might be familiar with wireless 3G technologies that enabled data transmission over mobile networks. Now, there is 4G, and 5G will soon be commercially available. Korea showcased its 5G capabilities at the recent Winter Olympics by streaming 360-degree videos and live Virtual Reality (VR) experiences. Unlike 3G or 4G, 5G allows data-streaming and processing at unprecedented speeds. Imagine applying 5G to your everyday phone conversations. Such developments would significantly change our speed of information exchange, and has many potential applications to enhance our defence communications and network systems.

4. Second, rapid advancements in the field of artificial intelligence or AI have allowed us to lead better and perhaps more enriched lives. We talk about AI as though it is futuristic, but I assure you it is here and now. Look at your smartphones – that small device in your hand possesses a trove of AI technologies. It uses predictive technology to offer recommendations based on your previous interests, choices and behaviours. And within your smartphone, you have smart pages such as Facebook, Netflix, Spotify. So how does Spotify even know before I do that I might enjoy listening to Kpop songs? I do listen to Kpop songs, but how did they know that? It is probably because of what I keep searching each time I want to listen to music.

5. At the national level, we have applied AI to enhance our defence of Singapore. The Republic of Singapore Air Force and Defence Science and Technology Agency (DSTA) are working to develop “smart airbases”, in areas such as automated aircraft inspection and runway damage assessment by autonomous drones. We are also building the Singapore Armed Forces (SAF) Training Institute (SAFTI) City, which will be an advanced training facility to prepare soldiers for Island Defence and urban operations. We will enhance the training experience and performance feedback through a process-streamlined one-stop training centre, gamification, and integrated training support.

6. We invest in game-changing technologies and adopt new fighting concepts to enhance Singapore’s peace and security as we build the Next Gen SAF to improve capabilities and optimise resources. The above are but a few examples. We can do much more with technology to transform

our platforms and facilities. As we are experimenting on driverless buses and cars in our universities, imagine the possibility of having driverless tanks and leveraging VR for training of our soldiers.

Emerging Technologies in Defence

7. The defence area is a hotbed for (the) growth and development of new technologies, especially with the presence of hybrid threats. Here in Singapore, the Defence Technology Community (DTC) has been working with the SAF to innovate and turn concepts into reality. In the face of new emerging threats and our manpower challenges, we need to rely on ourselves to innovate and achieve a quantum leap in our capabilities.

8. You might have heard, in recent news, about the Unmanned Watch Tower (UWT) deployed at Jurong Island to monitor Singapore's waters. Designed and developed by DSO National Laboratories (DSO), the UWT is equipped with advanced sensors systems that cover a wide surveillance area and uses video analytics to automatically detect any intrusion for quick response. Before this, our soldiers had to manually scan our waters using binoculars. Now not only can surveillance be done with significantly less manpower, we can watch areas twice as large and even see very clearly at night.

9. With the emergence of hybrid threats, it is even more crucial to leverage technology to protect our way of life. In recent years, our security agencies have managed to thwart terrorist plots based on intelligence and cooperation with intelligence agencies internationally. Using common situational awareness technology, the SAF and the Home Team can further enhance and strengthen their joint work in homeland security operations. To prepare the soldiers, their training simulators have also been updated to include several homeland security scenarios.

10. Technological advancements, while fantastic, require us to manage things very carefully, especially in the area of data sharing. Take wearable technology, such as Fitbit, for example. Many of us have Fitbit on our wrists – we use it to track our heart rate, our fitness, our work-outs, and even find new jogging routes and exercise partners. In January 2018, Strava Labs, a fitness-tracking app company, published heat maps showing movements of global users tracked via GPS. It found that data from staff using the app in a classified US military base inadvertently revealed sensitive

locations and common patrol routes, prompting security concerns. As more data is generated and collected, it is important that we remain alert and vigilant to how it can be exploited.

11. Within the YDSP, there are initiatives aimed to create awareness of threats such as these and equip our aspiring scientists like yourselves with the necessary skills. For those interested in cyber defence, one such initiative is the World of Science (WOS) workshop, which consists of a Computer Security module on cryptography, malware analysis, and network intrusion detection. This four-day workshop, conducted by engineers and scientists from DSO, includes hands-on activities that allow students to get a glimpse of what it would be like to be a cybersecurity engineer.

The Future of Defence

12. The YDSP is but the icing on the cake regarding the possibilities of Science and Technology in defence, and the importance of leveraging technology in maintaining a credible defence. It also provides some insight into the exciting work of our defence engineers and scientists. If you did not know, there are about 5000 scientists and engineers from the Ministry of Defence, DSTA and DSO working together to harness the power of new cutting-edge technologies to deliver new capabilities for the SAF.

13. Under their mentorship, some of your projects have been recognised at national competitions like the Singapore Science and Engineering Fair. I hope that participating in the YDSP activities has fired your passion in the field and inspired you to join the ranks of our DTC and contribute to making Singapore a safe country for all.

14. There are opportunities aplenty to pursue an exciting career in defence technology. Just ask Gabriel Wong, one of our YDSP alumni. In 2008, Gabriel took part in the Cryptography and Wavelets module under the YDSP and studied the Elliptic Curve Factoring Method. For him, working with the mentors also allowed him to see how DSO has an open work culture where experts from different fields would readily share their ideas and suggest new approaches. This experience significantly influenced his decision to pursue a career as a DSO research scientist.

15. Another alumni is Karin Neo Yuan Ting. Since young, she has been awed by the intriguing

science of Aerospace, which led her to attend WOS Aerospace modules. Today, she is a defence engineer at DSTA's Air Systems Programme Centre, working on providing the SAF with maritime air surveillance capabilities that protect our seaward defence and sea lines of communications.

Closing

16. I said this last year and I will say it again this year – these are great times to immerse yourselves in the field of Science, Technology, Engineering and Mathematics or STEM. There is tremendous potential to dream big, to innovate, and (to) make things better. Discovering Science and Technology is a journey; not just head knowledge. The various YDSP activities have been designed so that you can learn by doing, and exercise your imagination and resourcefulness. We also hope that these activities will continue to inspire you and fuel the passion in each and every one of you to make it a lifetime pursuit for knowledge that will benefit mankind.

17. Finally, allow me to extend my heartiest congratulations to all those who have successfully completed your YDSP journey, and to our 160 YDSP Scholarship, YDSP Academic Award winners and DSTA Junior College Scholarship recipients. I look forward to learning more about your exciting projects at the exhibition later. To the parents, teachers, mentors, friends and family here today, I hope you are as proud as we are of all these very young scientists.

18. Thank you so much, (and) have a pleasant day.

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