



SPEECH

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SPEECH BY SENIOR MINISTER OF STATE FOR DEFENCE, MR HENG CHEE HOW AT THE INAUGURAL BRAINHACK 2019 CEREMONY, ON 14 JUNE 2019, 1645HRS, AT SINGAPORE EXPO

Permanent Secretary (Defence) Mr Chan Yeng Kit,
Chief Executive, DSTA, Mr Tan Peng Yam,
Distinguished guests,
School representatives,
Camp participants,

And I am told that a good number of teams have also come from overseas, a particularly warm welcome to our friends from afar,
Ladies and gentlemen,

1. A very good afternoon. I am delighted to be here at the award ceremony of the inaugural BrainHack. It is a pleasure to see so many eager faces and bright minds in this room. With the 4th Industrial Revolution bringing vast new opportunities and changes in technology, it is timely that DSTA is holding events such as BrainHack to engage and equip the younger generation to thrive in today's digitalised world. Efforts like this will spur our youth to discover the many exciting ways in which technology will contribute to Singapore's defence and security, and indeed to all aspects of life in Singapore.

2. With the rise of unconventional threats today, such as those originating from the cyber and digital domain, digital heroes often play a key role in saving the day. You see them in the movies, for example *Avengers: Endgame*, and other movies making use of the same ideas, same thinking, issuing the same message. So these superheroes, they lead seemingly ordinary lives, and then when the moment calls for it, they rise to the occasion, they save the day, and make the world a better place. And in our own way, we are trying to generate that interest, that passion and that capability, so that we can really call forth that, to generate a better future, do more good.

3. In recent years, real-life superheroes in the field of science and technology have emerged. These unassuming individuals often work tirelessly for causes they believe in, and have honed their skills for the benefit of those around them. Despite the possibilities of using technology for unlawful, selfish ends, such as those who engage in cyber hacking, those same technologies and

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capabilities can indeed also be deployed for good, and that is what we are about. So take for instance, German IT expert Fabian Wosar, who devoted himself to creating and distributing free anti-ransomware programmes, to help the victims of criminal gangs, because these gangs use ransomware to extort money. And he was so good at it that he really irritated the cyber criminals, because he was getting in the way of their money-making, and he received threats issued by these criminals against him. But I do not think he is deterred, and neither should the rest of us – we should stand on the side of what is right, what is good, and make sure that this side wins out.

4. A second example, and that one is Artificial Intelligence (AI) prodigy Tanmay Bakshi, who created his first application for IBM’s Watson supercomputer at the ripe age of 11. And he is now 15 years old, and he hopes to use his talents for good in healthcare and unlock AI’s vast potential through the use of artificial neural networks. One of his projects involves using deep learning algorithms to process and convert brainwaves into natural language, which has the potential to facilitate communication, for example, for severely disabled patients.

The Need for Talent to Meet Evolving Defence Needs

5. To remain relevant in today’s evolving security landscape, Singapore is actively developing capabilities to leverage AI, particularly because AI is rising in global prominence. In February this year, the Singapore Government announced¹ plans to form an inter-agency taskforce to study how Singapore could develop AI as a strategic capability at the national level. And this would mean developing and applying AI solutions for everyday tasks, such as optimising traffic light networks or identifying potential problems before things break down.

6. These AI solutions are especially practical in view of our, that is Singapore’s, population challenges. As I think all of us in this room would know, one of our challenges in the population area is our low fertility rate, last year, 1.14. What does that mean? To replace a population, we need 2.1 – so you can see the scale of that challenge. But what does that got to do with, for example, defence? And if you remember that for our defence, we build our defence around National Service, then you begin to realise that this would have to translate into a manpower challenge. So then what are you going to do in order to overcome that? Because you cannot say that if I do not have enough people, I am less able to defend myself, so please attack me less. It does not happen that way. In fact, if you are weak, you would probably be attacked earlier and more. So we have to find different ways, effective ways to keep up our level of defence, in fact improve on it, and technology would be the key to this. And this may come in the form of systems, enabled by AI, that are not only unmanned but also more autonomous, so that less manpower is needed to operate them. Moreover, such AI-enabled systems may potentially achieve even better performance than current setups.

7. From a defence perspective, AI also has the potential to contribute greatly towards modern warfare, by enabling military systems to handle large volumes of data more efficiently, and sieving out useful insights from this whole ocean of data. In order to maintain Singapore’s technological edge in defence and security, it is important to continue to upgrade our systems technologically through AI and all other forms of technology. So just now that little bit of clip showing the Hunter fighting vehicle, that is an example where you could then not only make that vehicle a more powerful vehicle on its own, but in a network enabled by the way you connect and use data, then

¹ Speech by Minister-in-charge of Smart Nation Initiative Dr Vivian Balakrishnan during the Committee of Supply Debate on 28 February 2019.

you're fighting with systems. To do this, we need to nurture passionate and competent AI and tech leaders to explore new frontiers as we prepare for this future.

8. Of course AI is important but it is not all. Aside from AI, BrainHack also emphasises the importance of cybersecurity in the face of new cyber threats in today's digitalised world. This year, digital defence was announced as the sixth pillar of our Singapore's Total Defence concept, underscoring the significance that Singapore places on cybersecurity. Increasingly, we have to be vigilant and guard against cyberattacks where the perpetrator's objectives, wide-ranging, could be sabotage, it could be espionage, it could be to gain an unfair advantage. Unlike conventional warfare, these kinds of threats transcend geographical limitations and state boundaries. In other words, you can be attacked from anywhere on Earth, any time, without prior notice. To protect our systems well against such perpetrators, we need to develop really world-class capabilities, with the support of very capable and committed individuals.

Opportunities to Serve the Nation in Cybersecurity and AI

9. Singapore, therefore, wants to fight this critical technological battle with the help of everyone, and in particular our defence engineers, who harness cybersecurity and AI to drive innovations in defence capabilities. As an example, engineers in DSTA and the Singapore Armed Forces (SAF) have developed the Fleet Management System, which uses data analytics and the Internet of Things to detect anomalies, pick up patterns and perform pre-emptive rectification of systems. This paves the way for resource optimisation and "predictive maintenance" in the SAF. This ability to detect system failures earlier, or early will be further enhanced through the training of machine learning models. To ensure higher standards of cybersecurity, DSTA developed and integrated AI and machine learning into cybersecurity systems to detect and respond to cyber threats round the clock. And all that really means is that your fleet will be up more of the time than before, both because mechanical maintenance is enhanced, but it is also because you are then better enabled to keep it up against enemies who might want to down your systems by interfering with these commands.

10. Beyond optimising systems, AI has the potential to maximise human efficiency by enhancing military training to provide soldiers with more dynamic and realistic environments. This is accomplished by replicating human behaviour and reactions to simulate real-life hostile scenarios, or battle scenarios. AI can also be employed to analyse soldier performance and identify areas of improvement, ensuring steady progression and learning for each individual soldier. And all this, ultimately, will help to enhance both operational readiness and safety.

11. These are just some ways in which our defence engineers are innovating and creating new capabilities to protect our critical systems. DSTA, together with MINDEF, recognises that the potential that AI and cybersecurity provide and are committed to developing these capabilities further. Through events such as this BrainHack, we hope to inspire talented individuals to follow in the footsteps of our defence engineers, and use your talents excitingly and purposefully for the greater good of Singapore. We hope to fuel your passion for technology and to enable you to continue developing your skills. There is still much untapped potential in the areas of cybersecurity and AI, with many exciting opportunities for those who venture. I strongly urge future cyber defenders, data scientists and developers like yourselves to seize these opportunities – and imagine a career that lets you pursue your interests while contributing to a greater national cause.

12. For those of you enlisting into National Service, you may also be happy to know that there is an opportunity to be a part of the Cyber NSF Scheme, this was launched last year. The idea of the scheme is to pull together such talent and to employ and deploy the skills of NSFs with such talent and expertise in this area in an entire set-up for our cyber defence, to help us strengthen our defences against cyberattacks. You will be trained to deal with advanced cyber threats, and engage in real-world cyber operations in this defence sector. As part of this scheme, there are also options to take up the Cyber Specialist Award to attain professional certifications, and participate in the Singapore Institute of Technology (SIT) Work-Learn Programme to earn undergraduate credits while you are doing your National Service.

Conclusion

13. I would like to conclude here by congratulating our BrainHack participants and especially to the teams that won, everybody is a winner – and so, well done! I hope this experience has sparked your interest in AI and cybersecurity, and fuelled your passion for these rising fields. I look forward to seeing many of you step up as Singapore’s defence tech superheroes in your own way, in the near future.

14. Thank you very much.

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