

Defending the nation

DSTA senior analyst Lian Zhengyi's role is a combination of an architect, detective and communicator

by teh joo lin

MR LIAN Zhengyi knew of lucrative jobs in the finance sector when he graduated from the Massachusetts Institute of Technology (MIT) in the United States and the National University of Singapore (NUS).

But for him, the real pay-off was in deploying his engineering skills to boost national security. So, he joined the Defence Science and Technology Agency (DSTA) in May 2008.

Mr Lian says: "An engineering position to work on Singapore's next generation air defence systems at DSTA appealed to me the most because it offered me an appealing job scope, with a meaningful opportunity to make a difference in our country's defence."

The 32-year-old holds two master's degrees: from MIT in computation for design and optimisation, and from NUS in computational engineering. He also completed an undergraduate degree – in mechanical engineering – at NUS.

He is a senior analyst at the DSTA Masterplanning and Systems Architecting Programme Centre, which develops capabilities and systems architectures for Singapore's defence systems and networks to fit and operate well with one another.

Countries require air defences to repel aerial threats such as hostile aircraft. An air defence system can comprise sensors that detect threats, command and control systems that process information for decision-making, and weapon systems that destroy the threats. The use of these different components – including how they are networked to share information – can prove vital.

This is where operations analysts like Mr Lian enter the battlefield picture.

He says: "One could compare our work to that of an architect who designs a building, except that we develop blueprints and frameworks that guide the acquisition and integration of defence systems."

Studies are run on different air defence solutions to arm the Singapore Armed Forces with insights into "how different air defence systems should be integrated and deployed optimally". Studies are also conducted to help identify future defence capabilities.

Mr Lian has developed analytical tools to aid the work. One meas-

ures the performance of weapons when paired with sensors – even before these weapons are acquired.

He says: "I love the mental exercise of figuring things out from scratch, and the process of developing these tools has helped me to gain a better understanding of the features and performance of the systems that I conduct studies on."

But the best tools require data to crunch on. This is where he requires the resourcefulness of a detective, to make the most of the limited data on future systems that are being studied.

"I have to figure out what this data is through hypotheses, predictions and various cross-checks with colleagues and industry partners. Having little or no reference might be challenging, but I get to learn how to find information," he says.

Communication skills are also important for operations analysts to translate their programming ideas to one another while building simulation models, and interact with the wider defence community that includes military commanders, defence contractors and other professionals.

Growing on the job

Having spent more than six years in the job, Mr Lian says a successful operations analyst requires curiosity and determination to "deliver non-intuitive insights through meticulous analysis".

He says: "One wants to bring new information to the table instead of data that everyone expects or wants to hear."

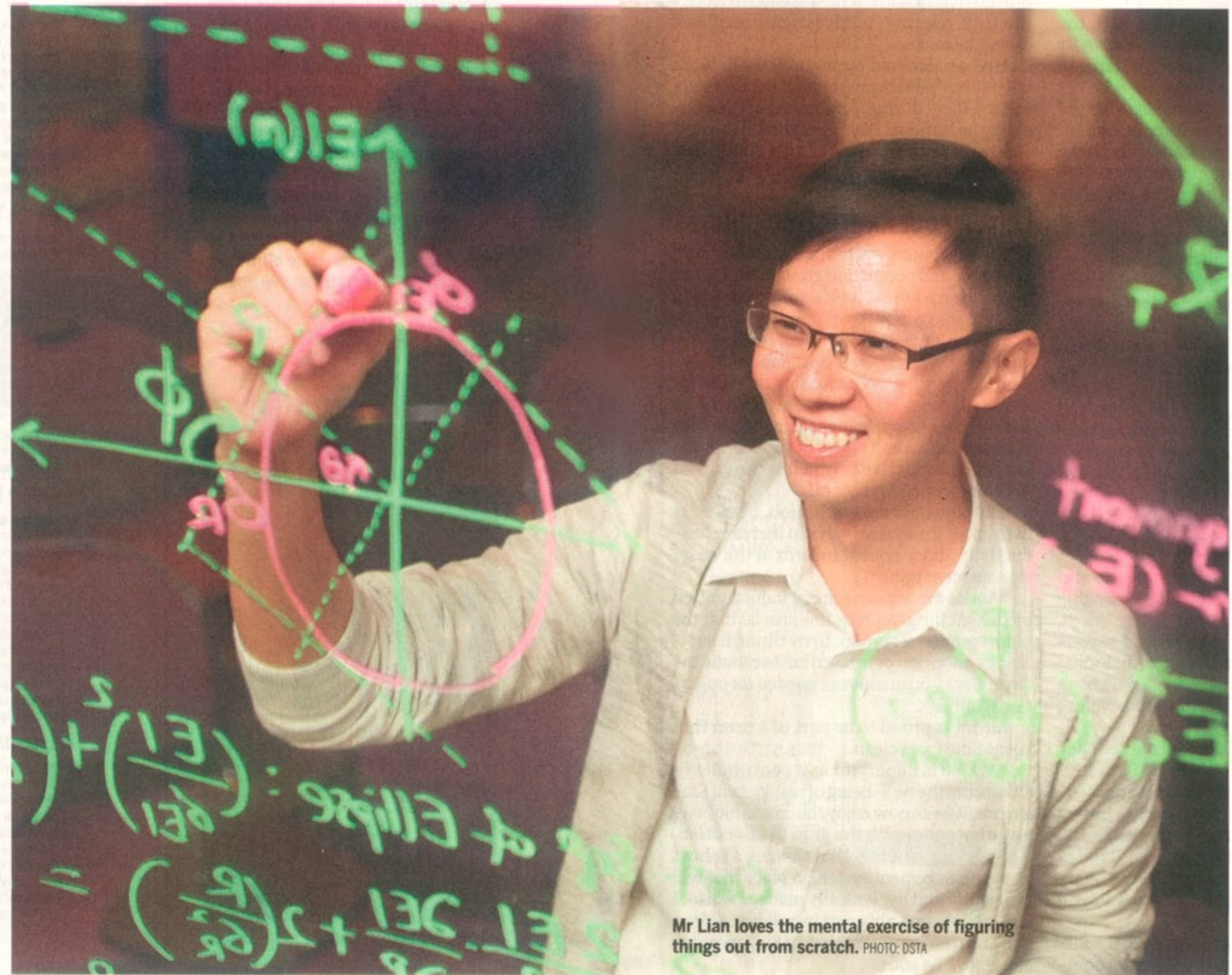
An analyst should also have the courage and conviction to defend his findings that may challenge established norms, even as he keeps an open mind to other perspectives.

These traits are not acquired overnight. Mr Lian credits the "knowledge-sharing culture and emphasis on learning" at DSTA, where he learns as much from colleagues as he does from external seminars.

To better appreciate the synergy between technology and military operations, he has participated in air force courses and site visits to deepen his understanding of operational doctrines and procedures.

DSTA has also sent him for overseas training in specialised software required for the work. He even gets to tap the knowledge of the international research community and foster professional relationships, by taking part in a joint research collaboration – to design robust and evolvable systems – between DSTA and MIT between 2010 and 2013.

He says: "Knowing that the studies I conduct and the recommendations I make help to enhance the ability of our military to fight as a networked force is a tremendous driving force."



Mr Lian loves the mental exercise of figuring things out from scratch. PHOTO: DSTA