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FACTSHEET

Advancing Defence R&D at TL@NTU

Temasek Laboratories at Nanyang Technological University (TL@NTU) was jointly established by Nanyang Technological University (NTU) and Defence Science & Technology Agency (DSTA) in 2003.

The mission of TL@NTU is to develop core competency in selected areas relevant to national security and defence. Its key R&D areas are Monolithic Microwave Integrated Circuit (MMIC), Radar, Signal Processing System on Chip, Advanced Materials, Tropical Weather, Computer Vision, Communications Signal Processing and Speech Signal Processing.

TL@NTU adopts an open-laboratory and open-office concept to provide an excellent environment to interact and work closely with the academia and the defence community. Full-time researchers form the backbone of TL@NTU's research personnel, with NTU professors leading and directing the R&D efforts within each research area. TL@NTU's research is further enhanced through collaboration by the secondment of staff from DSO National Laboratories.

To date, TL@NTU has a total of 69 staff comprising full-time and part-time researchers.

Exploring New Research Frontier

TL@NTU firmly believes in cross-functional research that is crucial to the generation and integration of new ideas, new knowledge and new technologies developed from its core research competencies.

This working model enables TL@NTU to integrate individual capabilities into new cutting-edge capabilities, find effective solutions to fulfil stringent requirements and also generate innovative ideas for the users.

In this regard, TL@NTU represents a natural synergy between the defence community and the academia. TL@NTU ensures that the developed technologies shift seamlessly into new capabilities and strategic applications.

Examples of cross-functional research at TL@NTU

One example of cross-functional research is the research work on optical shutter for eye protection that TL@NTU is working on for the Defense Advanced Research Projects Agency in US. The project involves materials research, optical physics and advanced electronics.

Another example is the research work on electromagnetic (EM) shielding enclosure. The development of high performance lightweight metallic foam materials was carried out by the School of Materials Science and Engineering while the EM shielding design, modelling and performance measurement were carried out by the School of Electrical and Electronic Engineering. Other examples of cross-functional research include MMIC technology and Signal Processing System-on-Chip.

TL@NTU R&D Highlights

MMIC Technology

The MMIC team in TL@NTU focuses on advanced R&D of III-V MMIC technology as well as in the building up of MMIC design, fabrication and testing capabilities. MMICs provide many advantages such as miniaturisation, lighter weight, enhanced performance, higher operating frequency and reliability, through the use of advanced semiconductor materials and semiconductor wafer fabrication techniques. This enables the development of more compact, efficient and lower cost communication and sensor systems. A MMIC Design Centre (MDC) was set-up in TL@NTU in 2005 to provide rapid and cost-effective prototyping services of MMICs, as well as for the conduct of advanced R&D in MMIC and related areas.

Radar Research

The Radar Research team in TL@NTU focuses on advanced and novel radar concepts like wall penetrating radar, foliage penetration radar and high frequency surface wave radar. The team actively engages in radar research including system design, antennas, microwave and digital subsystems, hardware integration, data collection, advanced signal and data processing as well as propagation and target modelling and analysis.

Advanced materials

The Advanced Materials Research Programme at TL@NTU aims to provide a platform for the application of cutting-edge technologies for soldier protection and survivability. The research group focuses on body and eye protection as well as in signature management and camouflage system technologies.

Tropical Weather Research

The Tropical Weather Research Programme aims to improve mesoscale weather forecast in Southeast Asia for Singapore through research into numerical

weather prediction models, data assimilation and data sources. The programme began in 2002 in Temasek Laboratories at National University of Singapore. It was moved to TL@NTU in November 2005.

For more information on TL@NTU, please visit www.ntu.edu.sg/temasek-labs/

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