

PARTNERING WITH NATIONAL SECURITY AND INTELLIGENCE SURVEILLANCE AND RECONNAISSANCE DIVISION

NSID engages with Australia's industry and science and technology community through a range of innovative and mutually beneficial arrangements, and actively seeks opportunities to work with industry to commercialise DST technology and transition our innovative concepts into Defence capability.

Potential areas for collaboration include:

- Evolutionary Layered ISR Integration EXemplar Architecture (ELIIXAR) hardware and software framework
- National Security Science and Technology in critical areas such as Big Data and Open Source Analytics, Identity Intelligence and technologies associated with Countering Violent Extremism.
- Space and small satellite programs.
- Advanced sensing and sensor processing (radar, electro-optic, hyperspectral, hypertemporal, imaging) and demonstration of next-generation surveillance and reconnaissance system concepts.

For further information

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MAJOR RESEARCH PROJECTS AND ACTIVITIES

ELIIXAR

Based on a modern services-oriented architecture and web-based design principles, the ELIIXAR ISR integration laboratory testbed - along with a secure, globally-deployable field element - is DST's ISR integration architecture. ELIIXAR interfaces with extant US and NATO ISR integration standards, while the architecture itself is based on a more extensible National Security Agency Cloud approach. NSID's individual research efforts - ranging from biometric intelligence to UAV ground environments and support to RAAF's Distributed Ground Station Australia initiative - are all integrated into this single, unifying information backbone.

Jindalee Operational Radar Network (JORN)

JORN, developed since the 1970s through DST's research in over-the-horizon radar technology, provides wide-area surveillance of Australia's northern approaches. The JORN system has been progressively enhanced through DST's continuing research and changing operational requirements.

WASABI

Project WASABI is a joint project involving a number of international partners to study patterns of flow of everyday activities in an urban setting by using wide-area airborne surveillance. The project will provide information to assist authorities in responding to public emergencies, disaster relief efforts and security for major events. Flight trials are conducted using the Defence Experimentation Airborne Platform.

Surveillance, Space and Small Satellite Program

Research in surveillance and space relates to broad-area and battle-space intelligence and surveillance. It involves exploring the integration and operation of sensors and assets across environments as well as the fusion and dissemination of resulting output in order to support tactical, operational and strategic needs. In particular this encapsulates the systems (such as spacecraft, ground stations and data links) forming the space network. DST is experimenting with very small satellites to determine how these systems might be used to address Defence and National Security needs with launches planned for 2017.



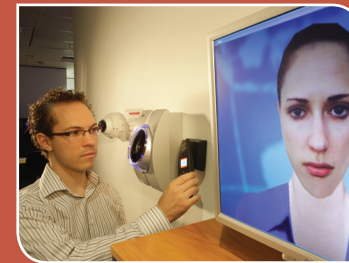
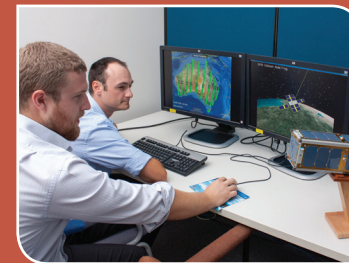
Australian Government

Department of Defence

Science and Technology

NATIONAL SECURITY AND INTELLIGENCE SURVEILLANCE & RECONNAISSANCE DIVISION

PARTNER WITH DST



Major Science and Technology Capabilities (MSTC)

NSID undertakes research and development into technologies aimed at enhancing the national capability to produce accurate, relevant and timely actionable intelligence for both Defence and national agency decision makers.

MSTC Intelligence Systems - Research and development of intelligence systems for geospatial intelligence (GEOINT), measurement and signature intelligence (MASINT) and imagery-based capabilities.

Advanced GEOINT Exploitation conducts research and development in algorithms, tools, techniques and environments for GEOINT image analysis and exploitation, including the automated fusion of multiple intelligence sources within the geospatial context.

Radar Processing and Exploitation conducts research and development in imaging radar phenomenology, sensors, modes, advanced data processing, target detection algorithms and intelligence exploitation.

Electro-optic Processing and Exploitation conducts research and development of visible and infrared phenomenology, sensors, modes, data processing, target detection algorithms and intelligence exploitation.

MSTC Information Integration - Research, development and analysis related to Intelligence, Surveillance and Reconnaissance (ISR) systems and system integration, applied to meeting Defence and national security capability needs.

Strategic Systems Analysis leads research, development, analysis and assessment of the ADO Integrated ISR Enterprise; developing and applies tools and techniques to assess capabilities of strategic ISR systems including those that are space based

Information Architectures investigates and develops hardware and software system constructs suitable for supporting the future Defence and National Security Integrated ISR Enterprise in intelligence, joint, coalition and inter-agency environments.

Data and Information Fusion develops and assesses novel algorithms that can deliver improved tracking and/or sensor fusion performance to the warfighter or intelligence user.

MSTC Surveillance and Reconnaissance Systems - Research into advanced technologies for operational surveillance and reconnaissance sensor systems, the associated signatures and phenomenology, and their performance assessment for application to current and future defence and national security requirements.

Microwave Radar Systems investigates advanced microwave radar technologies for enhanced detection, tracking and identification together with the associated electronic protection techniques, radar waveform design and radar system control.

Surveillance Modelling and Analysis conducts performance modelling and analysis of surveillance systems, primarily radar systems, including both parametric and signal simulation level models that encapsulate the interaction between signal, targets and the background environment.

Signatures and Phenomenology is responsible for high fidelity electromagnetic analysis to provide prediction and measurement of radar signatures (including radar cross section and high resolution radar signatures) and for research associated with radar imaging techniques.

MSTC High Frequency Radar - Maximises Australia's major investment in long-range over-the-horizon radar through the application and transition to service of advanced science and technology.

Radar Technology and Systems develops and fields specialised HF/VHF radar components and sub-systems for understanding radar component behaviour, understanding the connection between component and system performance, and for the wider experimental program.

Signal Processing and Propagation conducts research in signal and array processing, cognitive radar, coordinate registration, and algorithms and computing architectures for real-time processing.

Geophysical Phenomenology and Performance Assessment is concerned with all facets of support and intelligence in relation to HF radar. These include radar parameter advice, propagation modelling, network and radar level system modelling, target and antenna modelling, electronic intelligence functions exploiting our wider radar and propagation knowledge, and performance assessment.

MSTC Intelligence Analytics - Research and development to improve the situation awareness of Australian intelligence analysts.

Language Technology and Fusion develops analytical tools and techniques to assist analysts to process, analyse and manage their large volumes of unstructured and structured natural language content.

Human and Social Modelling and Analysis provides support to analysts to enhance understanding of threats arising from social conflict and terrorism, and also to develop ways to improve analysts' capabilities.

Analytic Interaction conducts applied research in human-computer interaction to support the efficient processing, structured analysis and collaborative assessment of all-source, including open-source, intelligence.

Biometrics group conducts research, development and trials of biometric recognition systems including related human factors. The current focus is on stand-off systems such as facial recognition, and the development of novel "soft" biometrics for fusion to create more robust classifiers.

MSTC Whole of Government National Security Program - The DST National Security Program, within our National Security and ISR Division, coordinates and fosters the development of science and technology (S&T) to enhance Australia's national security.

The Program is responsible for

The Program is responsible for - leading and coordinating the development and implementation of Whole of Government national security S&T policy - fostering international national security research collaborations - conducting strategic analysis of national security priorities and resourcing - integrating counter-terrorism technologies to benefit Defence and civilian agencies.

