Swinburne Defence Initiative

Detect and protect

Swinburne Defence Initiative

In an increasingly complex and dynamic defence landscape, Swinburne is committed to maintaining and enhancing Australia's national defence and security through a holistic, dual-layer approach.

The Swinburne Defence Initiative – Detect and Protect, outlines our commitment and framework for undertaking defence-related research and innovation, aligned with our flagship research areas, that advances national security for all Australians and the Australian Defence Force.

Detection research

Detection is crucial for maintaining national security and safety. We conduct research that can identify and discover the presence of potential threats and risks. This can include the use of advanced technologies, systems and tools to gather data, analyse information, monitor environments and identify indicators or anomalies that may signify a threat.

Protection research

Protection research strives to remove or mitigate potential threats. This involves the development and implementation of defensive strategies, security protocols, and technologies to prevent, minimise or remove threats.
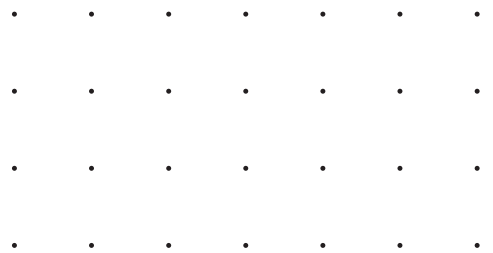
Our research capabilities

Swinburne is an internationally recognised research-intensive university that is focused on delivering research that creates economic and social impact. Our Research Ecosystem model is cross-disciplinary and committed to real-world impact, featuring six flagship research areas which are empowered by Swinburne's innovation and commercialisation capabilities. These flagship research areas include: Space and Aerospace, Medical Technology and Health Innovation, Innovative Planet, Innovative Society, Manufacturing Futures and Digital Capability.

Strengthening Australia's national security

Swinburne works closely with government and industry on strategic research projects that aim to support and enhance Australia's national security interests. Our world-leading researchers and state-of-the-art facilities enable Swinburne to be at the forefront of cutting-edge research that provides tangible impact for our partners. Key areas aligned with our 'Detect and Protect' focus include:

Space and aerospace

Swinburne has globally renowned capabilities in astrophysics, aerospace, aviation, engineering and digital technologies.

Current research capabilities include:

- Radiation sensors (chemical, biological, radiological, nuclear and explosive applications)
- Radiation hardened semiconductor chips for operation under space radiation (long-term geostationary missions) and high-power radio frequency radiation
- Satellites and satellite instrumentation
- Earth Observation.

Digital capability

Swinburne's cybersecurity and information protection research includes projects that focus on safeguarding systems from cyber threats and attacks.

Current research capabilities include:

- Secure communication protocols, encryption algorithms, intrusion detection systems to enhance protection of military networks and information infrastructure
- Cyber resilience technologies for developing preparedness of any organisation towards managing cybersecurity risk in terms of systems, data, assets, and human resources
- Artificial intelligence techniques for real-time handling of big data, and faciliating the data-to-decision process.

Manufacturing futures

We have extensive expertise in materials science and manufacturing technologies for developing protective systems.

Current research capabilities include:

- Advanced materials, composites, coatings and structures that enhance the resilience and survivability of military platforms
- Laser cladding repair of critical defence components and geometrical restoration of components made of ultra-high strength steel.

Education and training

Together with world-class infrastructure and globally renowned researchers, Swinburne provides a comprehensive suite of educational offerings, equipping organisations and individuals with the essential skills and knowledge needed when working within the defence and security industry.

Short courses:

A series of short courses are available that aim to prepare and develop industry and academia for future opportunities within the defence sector. These courses focus on advanced manufacturing, sensor technologies, artificial intelligence, cybersecurity, defence procurement, project management, logistics, and strategic planning within the context of defence-related operations.

Micro-credential courses:

Micro-credential courses are also available that cover specific high-priority areas including emerging trends, technologies, and skill gaps within the defence sector. These courses aim to upskill and reskill our current workforce to meet the future needs of the Australian Defence Force.

Future strategic focus areas

As a future-focused university, we have identified additional areas of strategic focus that we will continue to develop our long-term resources and capabilities in.

Future strategic focus areas include:

- medical and healthcare technologies
- robotic and autonomous systems
- human factors and decision support
- undergraduate and vocational programs
- postgraduate programs.

By 2025, Swinburne will:

- Increase the number of collaborative projects with the Australian Defence Force, Defence Primes and SMI/SME's
- Increase recruitment of defence-focused researchers and staff members with defence skills and experience
- In collaboration with Swinburne's Innovation and Enterprise portfolio, we will increase the number of commercialised Detect and Protect technologies and establish defence and security-related start-ups.

RECYCLE

FURTHER INFORMATION

✉ defence@swinburne.edu.au

➢ swinburne.edu.au/research/defence research

PLEASE
RECYCLE