

Defence Research

MU Murdoch University



Murdoch University has a long history of research across a range of themes.

Our Institutes focus our research across First Nations, Environment, Food and Health through the Ngangk Yira Institute for Change, the Harry Butler Institute, the Food Futures Institute and Health Futures Institute, as well as the Australian National Phenome Centre (ANPC) and the Indo-Pacific Research Centre.

Our modern facilities provide a home to leading research such as the state of the art, high-throughput metabolic ANPC that applies integrated technologies to study human performance and disease,

enabling scientists to discover new markers of disease and exposure. Our technology-enabled facilities like the award-winning Boola Katitjin also offer world-class education environments for teaching and learning.

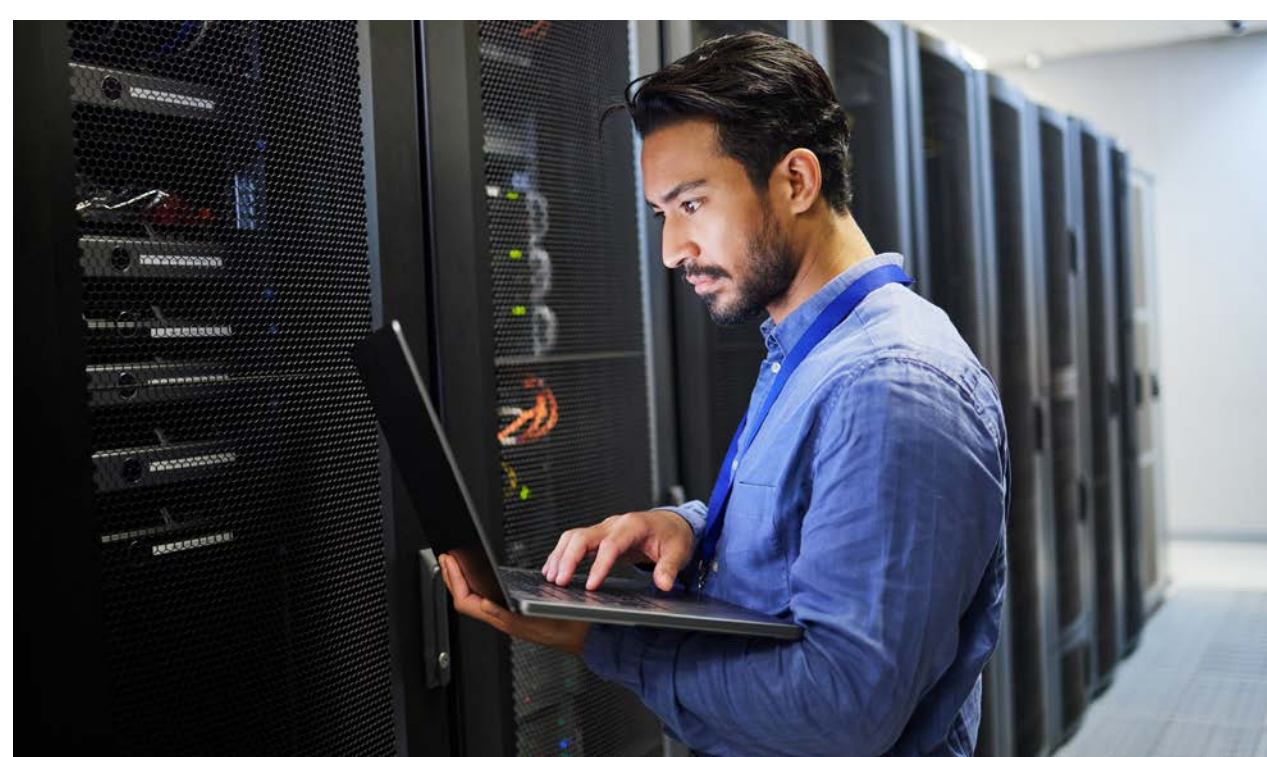
Murdoch University supports research across key Defence themes. We have a history of working with Defence stakeholders and our own recent strategic changes allow us to focus on our strengths, creating new partnerships and student pathways, global engagement and our existing and emerging research capabilities.

Research themes



Quantum, AI and cyber

- Understanding of and application of cybersecurity and block-chain to enhance supply chain security and ensure national security.
- Artificial intelligence (AI) and machine learning (ML) techniques, including image, sound and natural language processing for anomaly detection and rapid identification.
- Quantum processing to handle big data computation for defence applications.



Intelligence and Security

- Methods to understand and detect misinformation.
- Individual, social and organisational behaviours as indicators of mal intent.
- Methods for the detection, surveillance and identification of unique compounds and artefacts to benefit intelligence and security and forensic science applications.



Strategic Defence, Intelligence and Security Policy

- Understanding of the strategic environment contributing to Australia's national security including diplomatic relations, policing and corruption.
- Climate change, environmental and food insecurity.



Medical Countermeasures

- Rapid development of vaccines, therapeutics and diagnostics for the protection of civilian and military personnel against Chemical, Biological, Radiological and Nuclear (CBRN) threats, including emerging diseases, pandemics and antimicrobial resistance.
- Genome-wide and phenome-wide association studies for discovering novel metabo-genomic features linked to many diseases and pre-disease conditions.
- Rapid field-testing and sample collection tools and robotics.
- Non-combatant and humanitarian applications through population level screening approaches to enhance care and recovery.



Human Performance Optimisation

- Influences on individual and team performance including cognitive and physical load.
- Behaviour dynamics.
- Physical impact of the gut microbiome on cognitive function, insulating defence personnel in foreign environments through precision nutrition approaches.
- Cognitive enhancement through AI/ML and advanced simulation training, such as simulated control rooms.
- Health, well-being and recovery through precision programs and diets optimised for new environments, for example, a submarine workforce.
- Recruitment and retention for a modern defence workforce.
- Mitigating challenges in the field such as the impact of ticks on army personnel.



Multi-disciplinary Materials Science

- New materials for defence industries, including nanotech, tamper materials for explosives.
- Energy systems, including portable power.
- Critical minerals and metals such as used for nuclear-powered submarine batteries.
- Applications of novel materials in unique contexts.

Ngala kwop biddi.
Building a brighter future, together.

For more information:
Email defence@murdoch.edu.au or Phone 08 9360 6000

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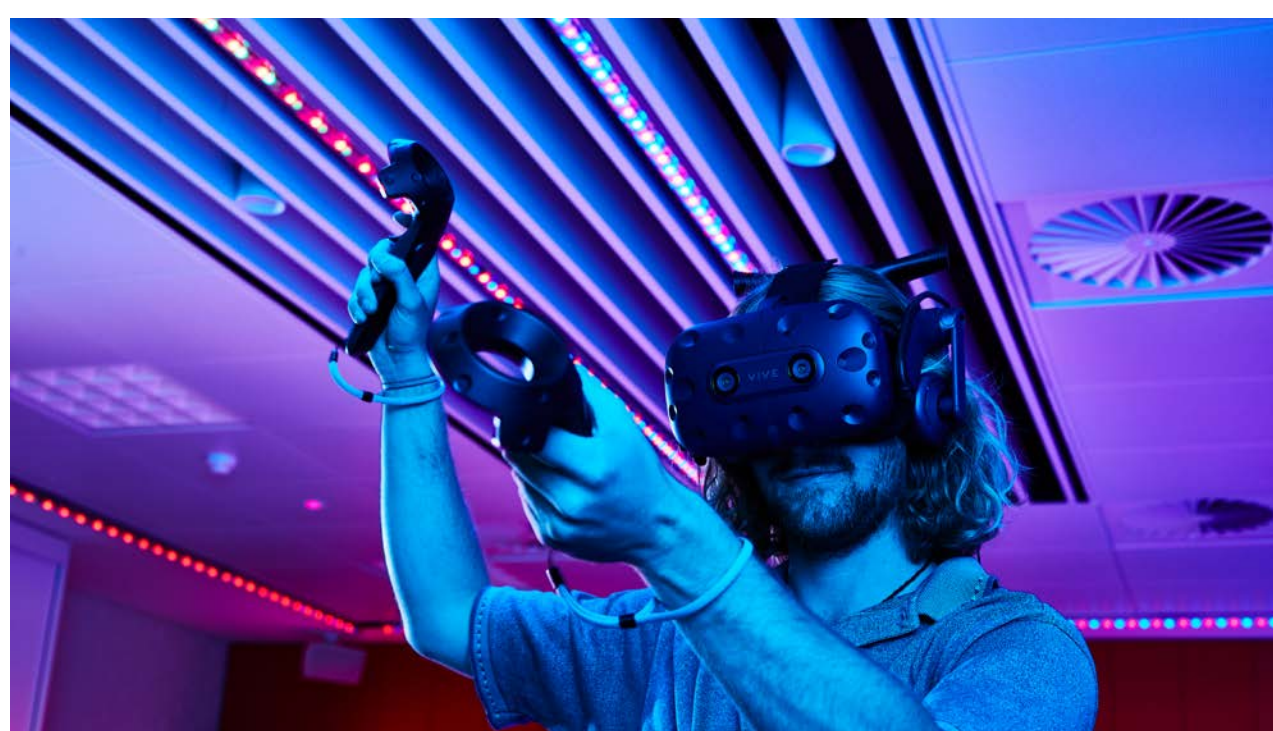
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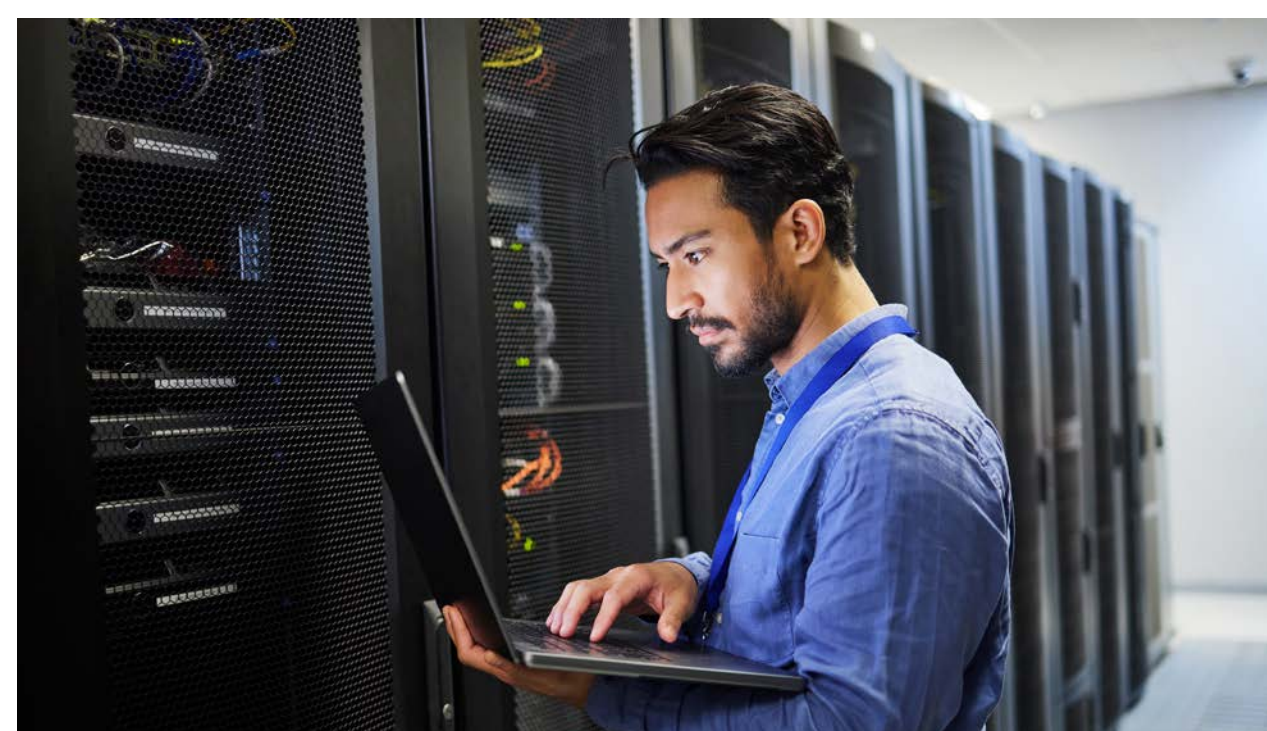
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