

Model Malicious Drone Swarm Behaviours and Devise Counter Strategies

Who can apply?

- Australian or New Zealand Citizens
- Australian Permanent Residents

Program of study available

- Doctor of Philosophy (PhD)

Industry partner and funding body

- [Saab Australia](#)
- [Defence Trailblazer](#)

Total annual stipend amount

- A base scholarship of \$40,000pa plus \$10,000pa top-up scholarship

Start date

- Plan for a start no later than June 2024

Benefits

- Work closely with skilled experts on defence industry led projects
- Translate research into a tangible solution for Defence
- \$50,000pa tax-free* stipend (pro-rated for eligible part-time students)
- No tuition fees apply
- Acquire a unique set of skills and expertise
- Enhance your employability skills sought after by industry; graduates are highly regarded by employers
- Opportunities for local and international travel
- Work alongside world-leading researchers
- Gain industry experience and grow your networks
- Solve real life problems through industry engaged projects
- Publish your contributions
- Become an expert and make a real impact
- Access paid annual, parental and personal leave.

About the project

This research project aims to model threats posed by drone swarm and to devise counter measure to protect major assets such as airports. A drone swarm countermeasures simulator has been developed in Saab Australia. The current capabilities of the simulator include ability to setup various scenarios for asset protection with parametrised sensor models and the ability to model spatially distributed sensors (i.e., sensors mounted on autonomous vehicles that are deployed from protected assets).

The simulator can also model multiple incoming enemy drones with some basic patterns/behaviour. Using and extending the capability of the simulator, we would like to conduct research on the behavioural side of this problem. Consider a scenario where there are a number of friendly (blue team) and malicious (red team) drones competing with each other with different objectives that are not known to each other.

We would like to investigate the problem where the red team and blue team are continually trying to outperform each other reactively. Recently, game theoretic approaches have been used for modelling this problem we would like to review literature in this area and build prototypes demonstrating the effectiveness

of the proposed algorithm/ approach. We would also like to analyse the proposed algorithm against several performance metrics such as computational efficiency and scalability as the number of drones increase. Such analyses also include assessing the algorithm's robustness against graceful degradation in adverse conditions such as communication failure/reduction in bandwidth, weather induced limitations, etc.

Eligibility criteria

- Australian citizens and defence industry professionals are encouraged to apply. It is expected that this project will require the candidate to have a security clearance which will likely limit applicants to Australian Citizens or citizens of countries within the Five Eyes Alliance (FVEY)
- Students who hold a master's in degree in computer science, robotics, or equivalent would be especially suitable and encouraged to apply
- Applicants with well-developed written and verbal communication skills will be considered favourably
- Be willing to share Intellectual Property with the industry partner and University by way of a Student Deed Poll.

How to apply

- Complete an [expression of interest](#)
- The primary supervisor will assess your eligibility, and if successful, will prompt your application for admission via the University of Adelaide.

More about Defence Trailblazer

The Defence Trailblazer for Concept to Sovereign Capability is a once in a generation opportunity to strengthen the collaboration between defence, academia and industry whilst accelerating research and commercialisation.

In partnership with the University of Adelaide (UoA), the University of New South Wales (UNSW), industry partners and supported by the Australian Government, the initiative will skill the workforce of the future, support defence-focussed innovation, and play a leading role in accelerating the delivery of sovereign capabilities for the nation's security and prosperity...at-speed and at-scale.

Learn more: <https://dtb.solutions/>

Industry Research Program

All students supported under the Defence Trailblazer initiative will participate in the Defence Trailblazer Industry Research Program (IRP).

Candidates will be located on-site at both university and industry offices for at least 60 FTE days (pro-rated for eligible Masters candidates), to enable professional development opportunities in an industry setting.

Defence Research Capability

Academics participating in the Defence Trailblazer IRP are leaders in their fields.

UNSW adds a critical dimension to preparing defence forces across areas as diverse as Autonomous Systems, Hypersonics, Sensors and Space. The UNSW Defence Capability Portfolio showcases UNSW's excellence in defence research and technology and highlights work across academia, government and industry, as well as with global policy makers, to create a hub of defence-related knowledge. The vision is to translate this knowledge into impact which can transform Australian and global societies.

There's no greater reassurance for our community than knowing we're well prepared to prevent or avert threats to our security. UoA researchers support this in very domain: on land and online; in space, the air and at sea, working extensively with the [Department of Defence](#) and defence-related organisations in a variety of ways—as an advisor, research partner and producer of high-quality, career-ready graduates equipped to make our world a better and more secure place.

[Find out more](#) about defence research at the University of Adelaide.

Further information

For a confidential discussion contact:

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Defence Trailblazer, together with UoA and UNSW, are actively working to support equity groups. We strongly encourage applications from people with a disability, veterans and women interested in working in non-traditional work settings
UofA CRICOS Number 00123M

