A COLLABORATIVE PARTNERSHIP BETWEEN

THE UNIVERSITY of ADELAIDE | UNSW

DEFENCE TRAILBLAZER
CONCEPT TO SOVEREIGN CAPABILITY

Drone Navigation in GPS Denied Environments

Up for a challenge?

Join us to work on a Defence-led research project with Geodrones Pty Ltd

Who can apply?

- Australian Citizens & Permanent Residents
- New Zealand Citizens
- Onshore international students from Five Eyes Alliance Nations (United States, the United Kingdom, Canada)

Program of study available

- Doctor of Philosophy (PhD)

Industry partner and funding body

- Geodrones Pty Ltd
- 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 15/12/2023

About the project

Geodrones is developing an obstacle avoidance system that can avoid obstacles in 360 degrees for a small form factor drone. Various field of view cameras have been tested including stereo and fish-eye lens cameras. Geodrones is investing to implement Artificial Intelligence (AI) based approaches for path planning and obstacle avoidance capability to improve the performance of existing off-the-shelf solutions. Another line of investment includes development of GPS-free navigation solutions using Self Localisation and Mapping technologies (SLAM) and vision system. Several experiments have been conducted so far demonstrating promising results.

This project aims to improve on existing algorithms for SLAM with a view to implementation on Edge AI enabled devices installed on real drones. The desired outcome is a method to intelligently fuse sensors like LiDAR, cameras and inertial systems to provide robust obstacle avoidance capability in cluttered environments without reliable GPS data.

The project will be conducted in both simulation and on real UAV platforms with hardware-in-the loop experiments. Algorithms will be developed for Edge AI enabled devices to achieve UAV payloads that are lightweight, use minimal power whilst meeting flight safety requirements

Eligibility criteria

- Australian citizens and defence industry professionals are encouraged to apply.
- Applicants with strong experimental and numerical skills in robotics, computer vision or control systems will be considered favourably.
- Be willing to share Intellectual Property with the industry partner and University by way of a Student Deed Poll.

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.

* Conditions apply

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 UNSW.

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 Industry Research Program (IRP).

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

Defence Research Capability

Academics participating in Defence Trailblazer 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. UofA researchers support this in every 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, and defence capability portfolios at UNSW

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

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