



## Autonomous Systems Engineer (Algorithms)

### APR Internship Opportunity – 6-month project opportunity as PHD Internship program.

DefendTex is an Australian owned Defence company with a strong focus on innovation, research and technology development. DefendTex services military and law enforcement communities around the world. At DefendTex, we value integrity, innovation, professionalism and passion. Our vision is to be a world leader in defence innovation.

DefendTex are seeking an Australian Postgraduate Research Intern (APR.Intern) for a six (6) month internship project placement working on the development of cutting-edge Defence technologies.

#### About this role

The project will be focused on the development and integration of autonomy algorithms for swarming UAV platforms. Utilising a pre-defined autonomy architecture, the role will focus on a variety of approaches including developing dynamic path planning and task allocation algorithms within both GPS enabled and contested environments. The implementation of algorithms to support distributed decision making and task allocation to ensure true autonomy to the swarm, improving the trust that flight objectives can be achieved in a dynamic operating environment. Through the use of a sensor, inter swarm ranging and monitoring of agents will be undertaken in order to drive swarm behaviour to adapt to and avoid sources of risk in order to improve the survivability of swarm nodes. The successful candidate will be working in a team of researchers at the University of Melbourne and collaborating with other organisations to achieve these objectives.

This project will deliver an integrated system capable of demonstrating algorithmic development catering to a dynamic field environment of swarms of UAVs and will be physically demonstrated within 6 months. This internship offers a compartmentalised project that will feed into a large-scale project.

#### About you:

##### Essential:

- Currently undertaking PhD in Engineering, Computer Science or Applied Mathematics, or an equivalent.
- Expertise in the theory of system modelling and control
- Strong interest in the application of systems modelling and control to address practical problems in real-time decision-making scenarios
- Experience in control barrier functions
- Ability to approach research and problem solving innovatively and creatively
- Australian Citizenship - must be eligible for the Australian Government BASELINE security check
- Not be a prohibited person under Section 3 of the Firearms Act 1996 (Victoria).

##### Desirable:

- Experience with the implementation of numerical methods
- Experience with engineering applications of optimisation techniques in real-time control of dynamical systems
- Experience or knowledge of geodesic concepts
- Experience or knowledge in multi-agent systems
- Experience in an R&D role
- Thrives in a fast paced, dynamic work environment
- Interest and breadth of knowledge in other engineering domains

A dynamic, agile and enthusiastic applicant who operates well in a multidisciplinary team environment will suit this role.

#### Why us?

- Exciting project and industry leading innovation.
- Exciting opportunity to network in an established project team of multiple partners across academia and industry.
- Co-location between DefendTex and the University of Melbourne

We are committed to ensuring diversity, inclusion and equality are embedded throughout our organisation for the benefit of our customers and our employees. We strive for a positive and engaging workplace where mental health and wellbeing are supported. We welcome applicants from all diverse backgrounds, including Aboriginal and Torres Strait Islander people.

If you are a PHD Student and interested in this exciting APR Internship opportunity, please apply via the APR internship application process at <https://aprintern.org.au/internship/defendtex-apr-2087/>