POSITION DESCRIPTION



Department of Electrical and Electronic Engineering
School of Electrical, Mechanical and Infrastructure Engineering

Melbourne School of Engineering

Research Fellow in Planning, Optimisation, and Control

*In line with the special measure H103/2014 provided for under section 12 of the Equal Opportunity Act 2010 (VIC), the Melbourne School of Engineering strongly encourages applications from suitably qualified female candidates.*

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| Position No | 0049277 |
| Classification | Research Fellow (Level A) |
| Salary | $72,083\* - $97,812 p.a. (Level A) (\*PhD entry Level A.91,125 p.a.) |
| Superannuation | Employer contribution of 9.5% |
| WORKING HOURS | Full-time (1.0 FTE) |
| Employment Type | Fixed term position available for 2 years Fixed term contract type: ResearchThe Melbourne School of Engineering is strongly committed to supporting diversity and flexibility in the workplace.  Applications for part-time or other flexible working arrangements will be welcomed and will be fully considered subject to meeting the inherent requirements of the position.  |
| Current Occupant | New |
| How to Apply | Online applications are preferred. Go to [http://about.unimelb.edu.au/careers](http://hr.unimelb.edu.au/careers), under ‘Job Search and Job Alerts’, select the relevant option, and find by title or number. |
| contactFor enquiries only | Dr Iman ShamesEmail: ishames@unimelb.edu.auPlease do not send your application to this contact |

For information about working for the University of Melbourne, visit our websites:
about.unimelb.edu.au/careers

**The University of Melbourne**

Established in 1853, the University of Melbourne is a public-spirited institution that makes distinctive contributions to society in [research](https://research.unimelb.edu.au/), [learning and teaching](https://about.unimelb.edu.au/teaching-and-learning) and [engagement](https://engagement.unimelb.edu.au/). It’s consistently ranked among the leading universities in the world, with international rankings of world universities placing it as number 1 in Australia and number 32 in the world (Times Higher Education World University Rankings 2017-2018). https://about.unimelb.edu.au/strategy/growing-esteem

**Melbourne School of Engineering**

Melbourne School of Engineering (MSE) has been the leading Australian provider of engineering and IT education and research for over 150 years. We are a multidisciplinary School organised into three key areas; Computing and Information Systems (CIS), Chemical and Biomedical Engineering (CBE) and Electrical, Mechanical and Infrastructure Engineering (EMI). MSE continues to attract top staff and students with a global reputation and has a commitment to knowledge for the betterment of society.

Our ten-year strategy, MSE 2025, is our School’s commitment to bring to life the University-wide strategy *Growing Esteem* and reinforce the University of Melbourne’s position as one of the best in the world. Investment in new infrastructure, strengthening industry engagement and growing the size and diversity of our staff and student base to drive innovation and develop the transformative technologies of the future are all fundamental principles underpinning MSE 2025.

<http://www.eng.unimelb.edu.au/about/join-mse/why-join-mse>

**School of Electrical, Mechanical and Infrastructure Engineering**

The School of Electrical, Mechanical and Infrastructure Engineering undertakes teaching and research across a range of disciplines that are internationally recognised for their contribution to fundamental research. It has a number of well-established industry linkages and international partnerships. It is building a vibrant profile of interdisciplinary research, working with industry with an aim to contribute to society. It offers a comprehensive range of accredited Masters of Engineering and Master of Information Technology programs taught through the Electrical, Mechanical and Infrastructure departments as well as professional Masters programs. It has a substantial cohort of research higher degree students. A major focus of the school is to attract and retain outstanding and internationally recognised academic staff. The School is committed through strategy, culture and mentorship to increasing the number of female engineers and scientists on its staff.

**Position Summary**

The research fellow will join a team of academic staff and postgraduate students working on problems pertaining to real-time decision making in dynamic systems.

This position is available for 2 years and will be reviewed at the end of this period.

In this research, the investigation will focus on the coordination of a group of autonomous vehicles to achieve a common objective under uncertain and time varying operational considerations. The flexibility to be able to handle different scenarios and associated mission constraints will be an integral aspect of the research.

The aim of the research is to explore and develop novel algorithms that result in real-time implementation and can predict under different time-scales and make optimal decisions under given performance metrics while satisfying hard constraints. This will involve generation of solutions that respond to rapidly changing conditions and uncertainties in the environment.

The research fellow will have an outstanding background in Engineering, Computer Science, or Applied Mathematics (or equivalent), and experience with the implementation of numerical methods and engineering applications of optimisation techniques (continuous and discrete) in real-time control of dynamical systems with exposure to mathematical foundations of learning, graph theory, system verification, and temporal logic. The research fellow will be located in the Department of Electrical and Electronic Engineering in close collaboration with investigators in the School of Computer and Information Systems within the Melbourne School of Engineering, and collaborate with researchers and engineers internally and externally. In addition to preparing technical reports, research publications, and computer simulations, the research fellow may also have the opportunity to undertake teaching and student supervision is areas directly related to their research.

The University plan seeks to increase the diversity of the workforce and the representation of women in areas they have been traditionally under-represented. Consistent with this, the School is seeking to increase the representation of women in the academic workforce across engineering disciplines. Under a Special Measure, under Section 12 (1) of the Equal Opportunity Act 2010 (Vic) the School is seeking to lift the representation of women from 20% in 2014 to at least 25% over the next 5 years, and strongly encourages applications from suitably qualified female candidates.

# Selection Criteria

## Essential

* A PhD in Engineering, Computer Science, or Applied Mathematics, or an equivalent qualification;
* A record of quality research as evidenced by research publications in leading journals and at conferences of systems and control, planning and optimisation commensurate with opportunity;
* Expertise in system modelling and control and/or planning algorithms, and a strong interest in the application of these to address practical problems in real-time decision-making scenarios;
* A commitment to pursue the fundamental research topics as described in “Position Summary” above;
* Experience in using initiative, working with minimal supervision and ability to prioritise tasks to achieve project objectives within timelines;
* Demonstrated capacity to communicate research concepts to technical and non-technical audiences;
* Ability to work as part of a team that includes graduate and undergraduate students and good interpersonal and communication skills and the ability to interact with University staff and Defence Science and Technology Group at all levels.

## Desirable

* Experience with the implementation of numerical methods and engineering applications of optimisation techniques in real-time control of dynamical systems;
* Exposure to mathematical foundations of learning, graph theory, temporal logic, system verification, and combinatorial optimisation.

# Key Responsibilities

## RESEARCH – ADVANCEMENT OF THE DISCIPLINE

* Conduct fundamental and application-oriented research consistent with the “Position Summary” above;
* Develop effective timelines and milestones based on goals of the research program;
* Preparation and publication of top-quality research papers and technical reports;
* Preparation and delivery of technical presentations to Academia and Industry;
* Assistance in the supervision of student projects;
* Work towards building an independent research project.

## Teaching and learning

* Contribution to the Department’s teaching program by giving occasional lectures, tutorials and /or laboratories and supervision of students.

## ENGAGEMENT

* Attend and actively contribute to group meetings and department seminars;
* Present research results at local and national meetings and conferences;
* Effective liaison with external networks to foster collaborative research partnerships;
* Contribute to the development of field trials with the industry partner.

## service and leadership

* Assist with administrative duties and general laboratory duties including maintenance of the laboratory and equipment;
* Assist in the preparation and submission of competitive grant applications relating to the appointee’s research program;
* Perform other duties as requested by the appointee’s immediate supervisor;
* Perform other tasks as requested by the supervisor or the Head of the Department.
* Undertake Occupational Health and Safety (OH&S) and Environmental Health and Safety (EH&S) responsibilities as outlined in Section 4.

# Equal Opportunity, Diversity and Inclusion

The University is an equal opportunity employer and is committed to providing a workplace free from all forms of unlawful discrimination, harassment, bullying, vilification and victimisation. The University makes decisions on employment, promotion and reward on the basis of merit.

The University is committed to all aspects of equal opportunity, diversity and inclusion in the workplace and to providing all staff, students, contractors, honorary appointees, volunteers and visitors with a safe, respectful and rewarding environment free from all forms of unlawful discrimination, harassment, vilification and victimisation. This commitment is set out in the University’s People Strategy 2015-2020 and policies that address diversity and inclusion, equal employment opportunity, discrimination, sexual harassment, bullying and appropriate workplace behaviour. All staff are required to comply with all University policies.

The University values diversity because we recognise that the differences in our people’s age, race, ethnicity, culture, gender, nationality, sexual orientation, physical ability and background bring richness to our work environment. Consequently, the People Strategy sets out the strategic aim to drive diversity and inclusion across the University to create an environment where the compounding benefits of a diverse workforce are recognised.

# Occupational Health and Safety (OHS)

All staff are required to take reasonable care for their own health and safety and that of other personnel who may be affected by their conduct.

OHS responsibilities applicable to positions are published at:

<http://safety.unimelb.edu.au/people/community/responsibilities-of-personnel>

These include general staff responsibilities and those additional responsibilities that apply for Managers and Supervisors and other Personnel.