



POSITION DESCRIPTION

School of Computing and Information Systems
Melbourne School of Engineering

Research Fellow in Resilient Autonomous Systems

POSITION NO	0047608
CLASSIFICATION	Senior Research Associate (Academic Level B)
SALARY	\$98,775 – 117,290 p.a
SUPERANNUATION	Employer contribution of 9.5%
EMPLOYMENT TYPE	<p>Full-time (fixed-term) position for 2 years</p> <p>Fixed term contract type: Specific task or project</p> <p>The 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.</p>
OTHER BENEFITS	www.hr.unimelb.edu.au/careers/info/benefits
CURRENT OCCUPANT	New
HOW TO APPLY	Online applications are preferred. Go to www.jobs.unimelb.edu.au and use the Job Search screen to find the position by title or number.
CONTACT FOR ENQUIRIES ONLY	<p>Professor Richard O. Sinnott Tel +61 3 9035 4531 Email rsinnott@unimelb.edu.au</p> <p><i>Please do not send your application to this contact</i></p>

For information about working for the University of Melbourne, visit our website:

www.hr.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, learning and teaching and engagement. 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>

The School of Computing & Information Systems

The School of Computing & Information Systems (CIS) undertakes research and teaching across a range of information technology disciplines including Software Engineering, Information Systems, and Computer Science. It offers a comprehensive range of IT courses at all levels, including offerings in science, engineering, and business, and is at the forefront of computing research in Australia and internationally with close links to major computing research initiatives, including Melbourne Bioinformatics, IBM Research, the Microsoft Research Centre for Social Natural User Interfaces (SNUI), and DATA61 (formerly NICTA).

The School's aim is to attract and retain outstanding staff available in order to maintain a leading research and teaching. We have an existing highly successful research team in the area of the appointment, a large number of PhD students, and a substantial cohort of graduate students in our coursework Masters programs.

To find out more about CIS, visit: <http://www.cis.unimelb.edu.au/>

Position Summary

This Science and Industry Endowment Fund project concerns the implementation of team-based distributed systems to support the deployment of robust and resilient autonomous systems. The field robotics environment is both dynamic and unpredictable where communications may be intermittent and availability cannot be relied upon. Such systems should ideally work in a coordinated, team-based manner with vehicles or other sub-systems of varying capabilities that collectively work to achieve common goals. Systems often need to sense the environment, combine sensor data into coherent feature models and then translate that into information about which the system can reason and ultimately become more resilient. The goal of this project is to research and develop technology to facilitate resilient reasoning in the field robotics environment.

The successful Research Fellow will conduct leading-edge research and development in the area of intelligent agent technology. The candidate will ideally have a background in artificial intelligence (AI) with specific expertise in intelligent agent technology. They will utilise their knowledge applied to the task of integrated intelligence, surveillance and reconnaissance. The specific intent of this position will be developing and extending agent programming languages including those based on the belief-desire-intention (BDI) software models realised through an existing software platform developed by Agent Object Systems Pty Ltd (AOS – www.aosgrp.com). This will include the addition of teaming and resilience capabilities for intelligent agents working in environments involving distributed systems and autonomous vehicles.

1. Selection Criteria

1.1 ESSENTIAL

Successful applicants will be required to have:

- 1.1.1 A PhD in computing science or closely related discipline;
- 1.1.2 Extensive experiences with computational approaches to intelligent software systems development including expert systems;
- 1.1.3 Extensive experience with computer networks and distributed systems;
- 1.1.4 Extensive software engineering and programming skills in C++ and in Linux environments;
- 1.1.5 Proven high-level conceptual, analytical and problem-solving skills;
- 1.1.6 Demonstrated teamwork skills and capacity to work cooperatively formulating, developing and implementing new ideas and exercising sound judgement with a focus on the delivery of project outcomes;
- 1.1.7 Excellent written and verbal communication skills, including demonstrated documentation skills and experience;
- 1.1.8 High-level organisational skills and demonstrated ability to prioritise workloads and ensure the timely delivery of activities for team wide efforts.

1.2 DESIRABLE

- 1.2.1 Background in autonomous systems;
- 1.2.2 Knowledge and experience in all aspects of software development - from requirements specification to code delivery, testing and long-term maintenance and support;

- 1.2.3 Knowledge, expertise, and experience of working as a software developer in multi-organisational collaborative projects and use of associated technologies, e.g. GitLab.
- 1.2.4 Experience in software development with Qt;
- 1.2.5 Experience of usability and design considerations and improving human computer interaction more generally.

2. Key Responsibilities

- 3.1 Work closely with the Project team in formulating project goals and development of key scenarios.
- 3.2 Systematic development of solutions and research prototypes realising project goals working with the project team and especially the AOS software engineering team.
- 3.3 Technology transfer including research publications related to project results.
- 3.4 Supervising and mentoring junior staff (where appropriate);
- 3.5 Occupational Health and Safety (OH&S) and Environmental Health and Safety (EH&S) responsibilities as outlined in section 6.

3. Job Complexity, Skills, Knowledge

3.1 LEVEL OF SUPERVISION / INDEPENDENCE

The position will report to the Director of eResearch. This will include day-to-day collaboration and interaction with the other (external) software engineers at AOS and potentially with clients.

The incumbent will generally be expected to work under broad supervision and operate on a day-to-day basis with considerable autonomy in the achievement of specific objectives and targets.

3.2 PROBLEM SOLVING AND JUDGEMENT

Problem solving, interpersonal skills and judgement are important. An integrative approach to problem solving is required to understand and develop connections between the research groups across the University and beyond. Independent judgement is required in prioritising workloads, working to timelines/tight deadlines and coping with a variety of activities at once and exercising discretion. Given this, the incumbent will be required to manage complex issues and situations with discretion and exercise judgement in order to develop innovative solutions to service management and project delivery within an environment of competing priorities and resource constraints.

A high level of problem solving is required to meet timelines and deliverables. A level of creativity will also be required in order to recommend a range of new solutions for research with emerging systems technology.

3.3 PROFESSIONAL AND ORGANISATIONAL KNOWLEDGE

The incumbent is expected to have or acquire and then apply a broad understanding of the pertinent Government, University, rules, regulations, policies, procedures, systems, processes and techniques and how they interact with other related functions and services for success of the research projects on a teamwork basis.

The incumbent will have extensive knowledge of and experience in the development and delivery of complex IT systems.

The incumbent will have a broad appreciation of information and communication technology matters in relation to large IT projects and systems.

3.4 RESOURCE MANAGEMENT

It is important that the incumbent works in a timely manner and is able to work across multiple community needs concurrently.

3.5 BREADTH OF THE POSITION

The position requires interaction with a wide range of personnel from the Australian Defence Forces, external software suppliers and research collaborators.

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/topics/responsibilities/>

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