POSITION DESCRIPTION

THE UNIVERSITY OF MELBOURNE

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

Research Fellow in Machine Learning for Engine 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.

POSITION NO	0044519
CLASSIFICATION	Research Fellow (Level A)
SALARY	$69,148* - $93,830 p.a. (Level A) (*PhD entry Level A.6 $87,415 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: Externally Funded 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.
OTHER BENEFITS	http://about.unimelb.edu.au/careers/working/benefits
CURRENT OCCUPANT	New
HOW TO APPLY	Online applications are preferred. Go to http://about.unimelb.edu.au/careers, under 'Job Search and Job Alerts', select the relevant option, and find by title or number.
CONTACT FOR ENQUIRIES ONLY	Prof Chris Manzie Email: manziec@unimelb.edu.au *Please 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

Position Summary

The research fellow will join a team of academic staff and postgraduate students working on problems related to the control and calibration of diesel engines. The team maintains a longstanding partnership with Toyota Motor Company in this area.

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

The aim of the research is to explore and develop novel algorithms that are implementable in real-time to improve the fuel economy and emissions of diesel engines. Given the constraints present in the system, much of the work to date has focused on the development of model predictive control designs. One of the challenges in implementation of these controllers is the calibration to achieve the appropriate level of performance under different legislated limits and consumer demands for different markets. We intend to develop methods (based on a combination of machine learning and traditional optimisation methods) that can partially automate the calibration process for these advanced controller designs, leading ultimately to faster calibration of better performing engine controllers.

The research fellow must have a background in engineering or applied mathematics, with demonstrated expertise in modelling and control of dynamical systems and numerical optimisation. Experience with at least one of model predictive control; engine modelling and control; machine learning; and implementation of controllers on real systems is essential – while some background in more than one of these areas is highly desirable.

The research fellow will be located in the Department of Electrical and Electronic Engineering in the Melbourne School of Engineering and will be expected to be an active member of the Department, collaborating with other 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 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.

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.

1. Selection Criteria

1.1 ESSENTIAL

- A PhD in Engineering or Applied Mathematics, or closely related discipline;
- A record of quality research as evidenced by publications in leading journals and at conferences commensurate with opportunity;

- Expertise in the theory of system modelling and control, and at least one of model predictive control, machine learning, diesel engine modelling and implementation of controllers in real systems;
- 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 to non-technical audiences.
- Excellent interpersonal skills, including an ability to interact with internal and external stakeholders (academic, administrative and support staff) in a courteous and effective manner.

1.2 DESIRABLE

- Experience with the implementation of control systems;
- Experience with engineering applications of optimisation techniques in real-time control of dynamical systems;
- Exposure to mathematical foundations of learning.

2. Key Responsibilities

2.1 RESEARCH – ADVANCEMENT OF DISCIPLINE

- Independently plan and carry out research on the nominated research project and work towards completion of the aims of the project;
- Develop effective timelines and milestones based on goals of the research program;
- Perform data and microstructure analysis, and be responsible for qualitative and statistical analysis of research data and to communicate this information to the Chief Investigators and collaborators;
- Regularly write technical reports on the outputs of the experiments conducted, and maintain accurate and detailed records of all experiments conducted;
- Participate in preparation of manuscripts for publication in peer-reviewed journals;
- Liaise effectively with collaborators with a variety of internal and external stakeholders;
- Assist other researchers in carrying out experiments in order to work as a team and further the department’s research output;
- Contribute to the development of the Department’s and the School’s strong research program in control and signal processing;
- Work towards building an independent research project.

2.2 TEACHING AND LEARNING

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

2.3 ENGAGEMENT

- Active participation in some outreach activities relating to research and scholarship;

- Effective liaison with external networks to foster collaborative partnerships;
- Involvement in professional activities, including consultations and referrals;
- Present results at local and national forums;
- Attend and actively participate in departmental seminars, meetings and/or committee memberships.

2.4 SERVICE AND LEADERSHIP

- Active participation in the communication and dissemination of research;
- Identify sources of funding to support individual or collaborative projects, relating to teaching, research and engagement practice in the discipline;
- Effective supervision of research support staff.

2.5 OTHER

- 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.

3. 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 as vital in our continuous desire to strive for excellence and reach the targets of Growing Esteem.

4. 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.

5. Other Information

5.1 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.

The School's aim is to attract and retain outstanding staff. The School is highly supportive of increasing the number of female staff.

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

The Department of Electrical and Electronic Engineering is a vibrant community of internationally recognised researchers focused on addressing major challenges in Power Systems; Computation and Communication Networks; Electronic & Photonic Devices and Materials; and Systems Engineering. We have long-standing, strong partnerships with industry and government that support our researchers in conducting high impact research.

The Department offers both PhD and Masters level research degrees as well as the following postgraduate coursework degrees:

Professional Master of Engineering (Electrical)

Master in Telecommunications Engineering (MTE)

The Department also contributes to the Electrical Systems major in the Bachelor of Science. Further information about the Department can be found under www.ee.unimelb.edu.au/

5.2 MELBOURNE SCHOOL OF ENGINEERING

www.eng.unimelb.edu.au

The Melbourne School of Engineering is one of Australia's leading Engineering Schools and aims to be the school of choice for the highest performing students and research staff in Australia and within the Time Higher Education Supplement top twenty Schools of Engineering internationally by 2020.

5.3 THE UNIVERSITY OF MELBOURNE

The University of Melbourne is a leading international university with a tradition of excellence in teaching and research. The University offers staff many benefits and prospective staff are encouraged to view the following web links:

www.unimelb.edu.au

www.growingesteem.unimelb.edu.au

www.unimelb.edu.au/careers

5.4 GOVERNANCE

The Vice Chancellor is the Chief Executive Officer of the University and responsible to Council for the good management of the University.

Comprehensive information about the University of Melbourne and its governance structure is available at www.unimelb.edu.au/unisec/governance.html.