



POSITION DESCRIPTION

School of Chemical and Biomedical Engineering
Faculty of Engineering and Information Technology

Research Fellow in Semantic Visual Decoding

POSITION NO	0059551
CLASSIFICATION	Level A
SALARY	\$80,258* - \$108,906 p.a. (*PhD entry Level A.6 - \$101,460 p.a.)
SUPERANNUATION	Employer contribution of 17%
WORKING HOURS	Full-time
BASIS OF EMPLOYMENT	Fixed term up to 3 years 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	https://about.unimelb.edu.au/careers/staff-benefits
HOW TO APPLY	Online applications are preferred. Go to http://about.unimelb.edu.au/careers , select the relevant option ('Current Opportunities' or 'Jobs available to current staff'), then find the position by title or number.
CONTACT FOR ENQUIRIES ONLY	Dr Sam John Email sam.john@unimelb.edu.au <i>Please do not send your application to this contact</i>

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

Acknowledgement of Country

The University of Melbourne acknowledges the Traditional Owners of country throughout Australia. The University recognises the unique place held by Aboriginal and Torres Strait Islander peoples as the original custodians of country and their continued connection to the land, waterways, songlines and culture. The University respects all Aboriginal and Torres Strait Islander People and warmly embrace those students, staff, Elders and collaborators who identify as First Nations.

Commitment to Diversity and Inclusion

The Faculty of Engineering and Information Technology (FEIT) is committed to creating a diverse and inclusive environment that welcomes and values all people. We recognise that diversity is essential in contributing to the success of FEIT. Women, Aboriginal and Torres Strait Islanders, the LGBTIQ+ community, people living with disability and those from a culturally and linguistically diverse background, are strongly encouraged to apply.

Position Summary

The University of Melbourne is seeking a dynamic postdoctoral Research Fellow to join the Department of Biomedical Engineering, School of Chemical and Biomedical Engineering as part of the Japan Science and Technology Agency (JST) funded Moonshot Research and Development Program, "Liberation from Biological Limitations via Physical, Cognitive and Perceptual Augmentation". This project aims to record intravascular encephalography (EEG) in the transverse sinus, which is close to the visual cortex, to decode visual semantic information. Semantic encoding in the brain is thought to be present in the early visual cortex (V1, V2 and V3) and could be used for object classification in humans. The ability to access the intrasulcal areas in the brain afforded by the endovascular array leads to immense future potential for semantic encoding using this array. This will help to develop a novel visual brain-computer interface (BCI) using intravascular EEG.

The Research Fellow will conduct research in pre-clinical recordings of EEG in sheep while they are shown a variety of visual stimuli. This will include contributing to surgery, sheep management, equipment set-up, recording session, data analyses and application of neural decoding methods. It is anticipated that the role may require unaccompanied travel to Japan for up to a few months each year to work closely with collaborators at Osaka University. This research will lead to the preparation and publication of research outcomes in conferences and journals. The role may undertake small amounts of teaching and research supervision in related research areas.

1. Selection Criteria

1.1 ESSENTIAL

- ▶ PhD in Biomedical Engineering, Electrical Engineering, Mathematics, Computer Science, or equivalent;
- ▶ Experience in animal electrophysiology experimentation;
- ▶ Excellent neural signal processing and data analysis skills;
- ▶ Excellent programming skills;
- ▶ Strong background in machine learning specifically deep neural networks;
- ▶ Meticulous note taking and maintaining lab books
- ▶ Experience in 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;
- ▶ Excellent written and verbal communication skills, demonstrated by presentation of research results at conferences, internal forums and through manuscript submissions;
- ▶ 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

- ▶ Background in application of machine learning to brain-computer interfaces.
- ▶ Experience working with large animal models.

2. Key Responsibilities

The University of Melbourne sets 'Minimum Standards for Academic Levels' (MSALs) which are expected from academic staff. The levels are differentiated by level of complexity, degree of autonomy, leadership requirements of the positions, and level of achievement of the academic and may be amended from time to time.

2.1 RESEARCH AND ADVANCEMENT OF DISCIPLINE

- ▶ Contribute towards the research effort of the team and develop research expertise and deliver against research objectives in a timely manner.
- ▶ Under the guidance and support of Senior Academic staff, conduct internationally competitive research resulting in publications in high impact journals.
- ▶ Contribute to and publish academic papers and other scholarly outputs to a high academic standard in accordance with the research expectations of the University of Melbourne.
- ▶ Actively participate in team activities and engage collaboratively with the team.
- ▶ Actively participate in research seminars and conferences to disseminate research findings as opportunities arise.
- ▶ Contribute to the preparation of research reports to internal and external funding bodies as relevant.
- ▶ Undertake administrative functions and obligations primarily connected with the staff member's area of research.
- ▶ Contribute to and assist in the co-supervision and training of research students at undergraduate, Masters and/or PhD level.

2.2 CONTRIBUTION TO TEACHING AND LEARNING

- ▶ Undertake occasional teaching, tutorials, marking and laboratory duties as required by the Department/School.

2.3 ENGAGEMENT

- ▶ Engage with relevant professional and industry bodies and stakeholders to foster collaborative partnerships.

2.4 LEADERSHIP AND SERVICE

- ▶ Actively participate at School and Department meetings and, with guidance, contribute to planning activities or committee work to support capacity building in the School and Department.
- ▶ Contribute to or present research to the public to elevate public awareness of educational and scientific developments and promote critical enquiry and public debate within the community where appropriate.
- ▶ Effectively demonstrate and promote University values including diversity and inclusion and high standards of ethics and integrity.
- ▶ Actively contribute to Department activities such as Open day to promote student engagement.

2.5 OTHER JOB RELATED INFORMATION

- ▶ This position requires the incumbent to hold a current and valid Working with Children Check.
- ▶ Frequent work out of ordinary hours required for animal care and experimentation.
- ▶ Travel to Japan for research collaboration, for approximately 1-3 month per year.

3. Equal Opportunity, Diversity and Inclusion

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 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.

All FEIT employees are required to behave in a manner that creates; supports and encourages an inclusive and safe work environment for all.

<https://eng.unimelb.edu.au/diversity>

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:

<https://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 CHEMICAL AND BIOMEDICAL ENGINEERING

<https://eng.unimelb.edu.au/about/departments/school-of-chemical-and-biomedical-engineering>

The School of Chemical and Biomedical Engineering encompasses both the Department of Chemical Engineering and the Department of Biomedical Engineering. This fusion of engineering disciplines provides a dynamic and interdisciplinary environment that is world leading in both research and teaching.

5.2 DEPARTMENT OF BIOMEDICAL ENGINEERING

<https://biomedical.eng.unimelb.edu.au/>

The Department of Biomedical Engineering is a vibrant and rapidly growing department within Melbourne School of Engineering, working on some of the most challenging problems at the interface of engineering with life and medical sciences. The central aim of the Department is to apply interdisciplinary expertise and thinking to make new discoveries and provide innovative solutions that will improve healthcare and social wellbeing.

Our research covers a breadth of areas in biomaterials and tissue engineering; biomechanics and mechanobiology; bionics, biomedical imaging and neuroengineering; systems and synthetic biology. We have strong national and international linkages with industry, hospitals, research institutes, and universities.

We teach students within the Bioengineering Systems undergraduate majors in the Bachelor of Science and the Bachelor of Biomedicine, and offer two Masters programs: Master of Engineering (Biomedical) and Master of Engineering (Biomedical with Business).

5.3 FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY

The Faculty of Engineering and Information Technology (FEIT) 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). FEIT continues to attract top staff and students with a global reputation and has a commitment to knowledge for the betterment of society.

FEIT has never been better positioned as a global leader, anchored in the dynamic Asia Pacific region, creating and curating knowledge to address some of the world's biggest challenges. Through our students and our relationships with communities, we can not only respond to society's needs but anticipate and create engineering and IT solutions for the future.

<https://eng.unimelb.edu.au/>

<https://eng.unimelb.edu.au/about/join-feit>

Our ten-year strategy, FEIT 2025, is our School's commitment to bring to life the University-wide strategy Advancing Melbourne and reinforce the University of Melbourne's position as one of the best in the world.

To achieve our ambitions, we will continue to build new infrastructure to enable our teaching, research and engagement; we continue to recruit outstanding people from around the world; and we continue to attract high-quality students from across the globe who are at the heart of our enterprise.

<https://eng.unimelb.edu.au/about/feit-2025>

5.4 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).

The University's 10-year strategy, *Advancing Melbourne* will enable the University to contribute to advancing the state and national interest and make vital contributions to Australia's standing on the world stage. We seek to be a leading force in advancing Australia as an ambitious, forward-thinking country while increasing its reputation and influence globally. <https://about.unimelb.edu.au/strategy/advancing-melbourne>

Further information about working at The University of Melbourne is available at <http://about.unimelb.edu.au/careers>