POSITION DESCRIPTION

Research Fellow – Neuromorphic Maritime Vision

WESTERN SYDNEY UNIVERSITY

POSITION DETAILS

Position Title	Research Fellow in Neuromorphic Maritime Vision
Classification	Academic Level B
Position Number	7016348
School/Office	International Centre for Neuromorphic Systems (ICNS), MARCS Institute for Brain, Behaviour and Development
Division	Provost

POSITION PURPOSE

The Research Fellow will contribute to the Aqua Colliculus Autonomous Neuromorphic Sonobuoy Network (ASCA) research program by designing, developing, and validating maritime perception technologies for autonomous sensing systems. The role focuses on advancing neuromorphic and low-power vision approaches integrated with multi-modal sensing to improve environmental awareness in complex maritime conditions.

The Research Fellow will deliver high-quality research outcomes, including publications, datasets, and prototype systems, while supporting interdisciplinary collaboration and contributing to the translation of research into practical applications aligned with the University's strategic research objectives.

KEY ACCOUNTABILITIES

1. **Design and deliver maritime perception algorithms** (event-based and frame-based) that advance project research objectives and enable robust environmental sensing.
2. **Develop reproducible research pipelines** by implementing structured data workflows, baseline models, ablation studies, and clear performance reporting.
3. **Generate and manage high-quality research datasets** through systematic data collection, analysis, and governance in line with University policies and project standards.
4. **Produce and disseminate research outputs** including peer-reviewed journal articles, conference papers, and presentations that communicate project findings to academic and industry audiences.
5. **Integrate vision sensing technologies into operational systems** by implementing sensor interfaces, synchronisation frameworks, and calibration procedures that ensure reliable data capture.

6. **Enable effective field trials** by developing test plans and trial checklists, executing validation processes, and delivering post-trial data triage and quality assurance.
7. **Maintain robust research infrastructure and documentation** through accurate laboratory records, version-controlled code repositories, and well-structured technical documentation.
8. **Contribute to research capability and collaboration** by mentoring students and engaging with internal teams and external partners to support research delivery and translation.
9. **Contribute to researcher development** in collaboration with cognate School and Faculty through co-supervision of Honours, Masters and PhD Candidates

QUALIFICATIONS, EXPERIENCE AND SKILLS

1. Australian citizen (required due to the nature of the research and project requirements).
2. PhD in Computer Vision, Robotics, Electrical/Electronic Engineering, Computer Science, or a related field.
3. Demonstrated experience in event cameras (DVS/DAVIS) and/or conventional computer vision applied to challenging outdoor environments (HDR, low light, glare, motion).
4. Experience with detection, tracking, motion estimation/compensation, and range estimation (geometric and/or learning-based).
5. Strong Python and/or C/C++ skills; experience with Linux, reproducible experimentation, and version control (Git).
6. Experience with deep learning frameworks (e.g., PyTorch/TensorFlow), spiking neural networks, and model evaluation.
7. Track record of peer-reviewed publications and evidence of high-quality research output.
8. Ability to work in interdisciplinary teams, mentor students, and communicate results to technical and non-technical stakeholders.
9. Experience integrating vision with other sensing modalities (e.g., IMU/GPS and/or underwater acoustics) and managing time-synchronised datasets.

KEY RELATIONSHIPS

- **This position reports to**: Director of the International Centre for Neuromorphic Systems
- **This position supervises:** Nil
- **Key internal relationships:**
  - ICNS Director and MARCS Institute Director
  - Postdoctoral Research Fellow in Auditory Neuromorphic Engineering
  - ICNS Centre Manager
  - Colleagues in the Centre, Institute and across the University
- **Key external relationships:**
  - International and Industry Partners and Collaborators

CHALLENGES

- Developing reliable maritime perception in degraded and highly variable visual conditions, including glare, reflections, weather effects, and platform motion, which impacts the accuracy and stability of sensing and detection algorithms.
- Integrating and synchronising heterogeneous sensor data from vision systems and metadata sources, where differing data rates, formats, and timing introduce complexity in achieving accurate and consistent multi-modal outputs.
- Translating research algorithms into deployable embedded systems, requiring optimisation for low-power hardware platforms while maintaining performance, reliability, and computational

efficiency.

- Planning and executing field trials in unpredictable operational environments, where external factors such as weather, sensor limitations, and data variability affect data quality and the ability to produce reproducible and meaningful results.

UNIVERSITY EXPECTATIONS

The University expects that all employees are aware of, and comply with legislation and Western's policies and procedures relevant to the position, including but not limited to:

→ Code of Conduct
→ Work Health and Safety and Wellbeing Management System
→ Enterprise Agreement or Award
→ Anti-discrimination principles, Equal Employment Opportunity and staff and student equity.

Approved by: People and Culture Partner
Date: 16 June 2026