Job Opportunities in Robotics and Autonomous Systems at Queensland University of Technology (2016 onwards)

URL for this page: tinyurl.com/qutrobotjobs

The robotics and autonomous systems group at the Queensland University of Technology is always looking for excellent researchers to join us. Please have a look at the opportunities below if you are interested in joining us.

• ACADEMIC POSITIONS
  • POSTDOCTORAL RESEARCH FELLOW / RESEARCH ENGINEER POSITIONS
  • Australian Centre for Robotic Vision
  • An Infinitely Scalable Learning and Recognition Network (1 postdoc)
  • Superhuman place recognition with a unified model of human visual processing and rodent spatial memory (1 postdoc)
• INDUSTRY RESEARCH POSITIONS
  • Upcoming
• CLOSED / FILLED POSITIONS
  • APPLICATIONS NOW CLOSED - Automation enabling positioning for underground mining (2 Research Fellows / Research Engineers)
  • Associate Professor / Professor and Mining3 Chair in Mining Robotics (1 position)
• 2 x Tenure Track Lecturers / Senior Lecturers in Robotics

ACADEMIC POSITIONS

Please contact us if you are interested in becoming an academic at QUT.

POSTDOCTORAL RESEARCH FELLOW / RESEARCH ENGINEER POSITIONS

Australian Centre for Robotic Vision

5 postdoctoral research fellows / research engineers
Term: Up to 2 years

The ARC Centre of Excellence for Robotic Vision is leading the world in transformational research tackling the critical and complex challenge of applying computer vision to robotics. We believe that the ability to see, to visually understand the complex world around us and respond to it, is critical for the next generation of robots that will perform useful work in agriculture, environmental monitoring, healthcare, infrastructure inspection, construction and manufacturing.

We’re looking for five creative and imaginative postdoctoral researchers or engineers to join our team to solve real world problems working at the intersection of robotics, vision, learning and applications.

We’re particularly looking for people passionate about:
integrating hardware and software to build impressive robotic systems that perceive, act, and interact with the environment
• deploying state-of-the-art machine learning on robots in the real world
• integrating different fields of research, such as scene understanding, learning, probabilistic robotics, planning, and control
• addressing the mismatch between the performance of deep learned systems evaluated on datasets and the real world
• working in a large, diverse team of researchers in various fields

Ideally, you have experience in creating complex robotic software with ROS, and developing/applying deep learning architectures for tasks such as object detection, segmentation, reinforcement learning with common frameworks, including dataset preparation. You enjoy programming in Python and C++ and working in Linux.

In addition, you have specialised experience and interest in one or more of the following areas:

• Robotic grasping and manipulation
  ○ Creating mobile manipulation demos including navigating in complex environments
  ○ Designing novel mechanisms, for hands, arms and grippers, integrating tactile and haptic sensing
  ○ Implementing vision-guided grasping systems
  ○ Investigating (bimanual) object manipulation algorithms
  ○ Integrating multi-modal robot sensing to improve manipulation (vision, tactile and force measurements)

• Experimentally evaluating robotic and computer vision systems
  ○ Designing and conducting experiments to evaluate computer vision, machine learning, and robotics systems
  ○ A profound understanding of currently used benchmark datasets, their evaluation metrics and their limitations with respect to robotic vision
  ○ Working with simulations to better understand how robotic vision, computer vision, or machine learning systems behave in realistic scenarios. Experience with environments such as UnrealCV, OpenAI Gym is appreciated.
  ○ Working with cloud commute services such as AWS, Amazon Turk, or Google Cloud Platform Services
- System integration and deployment of robotic systems
  - Deploying learning techniques on robotic systems: from initial deployment, to data collection, update, and all the way to continuous/lifelong learning on robot systems

- Machine learning, reinforcement learning, computer vision
  - Insert
  - Bayesian Deep Learning, introspection and uncertainty estimation in deep learning for robotic vision
  - Deep reinforcement learning and imitation learning exploiting semantics, meta learning
  - Transfer learning (sim-to-real, robot-to-robot)
  - Semi-supervised and unsupervised learning
  - Continuous learning and active learning on robotic platforms

- Autonomous vehicle demonstrators and research
  - Develop and run centre-wide self-driving car research challenges and technical demonstrations, including the development of a standard miniature autonomous car platform and running of regular experiments on full-size self-driving cars and vehicle platforms,
  - Conduct and facilitate collaborative research in SLAM, localization, perception, detection, sensing, scene understanding and action recognition in close collaboration with leading researchers across the centre's 4 nodes.
  - A working familiarity with computer vision, deep learning, machine learning, autonomous robots / vehicles and sensing hardware, and a strong track record in leading collaborative team activity.

You’d join the Australian Centre for Robotic Vision (https://roboticvision.org) which is a partnership between four leading Australian universities. You will be based at QUT in Brisbane -- working with an inclusive group of people in a well equipped and modern lab in a very liveable city with a wonderful climate, see https://research.qut.edu.au/ras for details. Travel to the centre's other nodes in Melbourne, Adelaide and Canberra will be required.

We are offering two year contracts with a salary range between AUD93,313 and AUD110,821 and can also offer some assistance with relocation expenses. These are positions without teaching obligations, but with opportunities to supervise undergraduate and graduate students.
The Australian Centre for Robotic Vision supports a flexible working environment. Subject to visa restrictions, the present position is available as either fulltime or parttime. Women are strongly encouraged to apply. For information on the Australian Centre for Robotic Vision’s benefits in regards to travel funding and assistance for families please contact rv@qut.edu.au for an information sheet.

To apply please send an email to rv@qut.edu.au and include a full CV, a description of your relevant experiences, and a research statement that describes your passion for robotic vision research, outlines the problems you want to work on, and the approaches you would like to take to address them.

An Infinitely Scalable Learning and Recognition Network (1 postdoc)

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We are seeking a Postdoctoral Research Fellow to continue research at QUT on the Asian Office of Aerospace Research and Development (AOARD)-funded research project “An infinitely scalable learning and recognition network”.

The role involves developing neuroscience-based machine learning systems to create highly compressible and scalable learning and recall systems for autonomous systems. In particular, we are modelling the multi-scale, periodic encoding properties of grid cells found in the mammalian brain to create sub-linear scaling mapping and localization systems, and then expanding these systems into other sensory domains including sound. The project has collaborative partners at Harvard and Uni Notre Dame in neuroscience, computer vision and machine learning.

The role requires strong mathematical, machine learning, computer vision and large dataset processing skills, as well as paper writing and oral presentation experience.

This appointment will be offered on a fixed-term, full-time basis for 1 (one) year. Pending further funding outcomes, the appointment may be extendable by another year.

Apply and Enquiries

To express an interest in the role or for any enquiries, please e-mail michael.milford@qu.edu.au with the subject line “infinitemapping” and include:

- a one page cover letter detailing your interest in and experience for the role, and the earliest date you could feasibly start,
- a detailed resume including details of past research, and
- a link to your Google Scholar profile.

Applications close January 15th 2018.
1 postdoctoral research fellow

Robotics, computational neuroscience, place recognition, navigation

Term: 6 months to 2 years

This project will revolutionize our understanding of how humans and animals use vision to determine their location in the world. This understanding will lead to new computer algorithms that enable robots to navigate in any environmental conditions using cheap visual sensors and breakthroughs in our knowledge of the brain.

This project is a strongly interdisciplinary one spanning neuroscience, robotics and computer vision and candidates will require experience or a skill set that facilitates this interdisciplinary approach. Postdocs will have the very challenging but rewarding task of achieving research breakthroughs that impact multiple disciplines simultaneously.

Funded by the Australian Research Council

Skills and experience required:

- High level of competency in coding in C++, Python or Matlab (ideally more than one)
- High level of competency in using robotic software and libraries such as ROS and computer vision libraries such as OpenCV
- High level experience and published outputs in at least one of (ideally all) a) robotic navigation / SLAM / vision b) computational neuroscience and c) deep learning / machine learning
- Experience leading the writing of peer-reviewed academic papers that have been published in top tier international conferences and journals in at least one of the below fields:
  - In robotics, conferences: IROS, ICRA, RSS, FSR journals: IEEE TRO, IJRR, JFR
  - In computer vision, conferences: CVPR, ICCV, ECCV, WACV, journals: PAMI, IJCV
  - In neuroscience / computational neuroscience, J Neuro, PLoS CB, Hippocampus, Neural Networks
- The ability to rapidly read and distill key ideas and concepts from large quantities of literature across multiple fields

Enquiries: michael.milford@qut.edu.au
CLOSED / FILLED POSITIONS

APPLICATIONS NOW CLOSED - Automation enabling positioning for underground mining (2 Research Fellows / Research Engineers)
Reliably estimating the position of mining vehicles is the most urgently requested innovation for improving productivity and safety for the underground mining industry in Queensland and worldwide. Current underground positioning technologies require expensive, bulky sensing equipment and regularly fail in a number of scenarios: when the environment changes (as mines do), when the tunnel geometry is particularly uniform, and when adverse environmental conditions are encountered such as airborne dust. This project will build on QUT’s world leading research in camera- and multi-sensor-based navigation algorithms to develop an innovative and disruptive positioning system for underground mining.

Funded by the Queensland Government, Caterpillar and CRCMining (now Mining3).

Skills and experience required:

- High level of competency in coding in C++, Python or Matlab (ideally more than one)
- High level of competency in using robotic software and libraries such as ROS and computer vision libraries such as OpenCV
- High level experience and published outputs in at least one of (ideally all) a) robotic navigation / SLAM / computer vision and b) deep learning / machine learning
- Experience leading the writing of peer-reviewed academic papers that have been published in top tier international conferences and journals in at least one of the below fields:
  - In robotics, conferences: IROS, ICRA, RSS, FSR journals: IEEETRO, IJRR, JFR
  - In computer vision, conferences: CVPR, ICCV, ECCV, WACV, journals: PAMI, IJCV
- Experience in a high pressure environment driven by deadlines around demonstrations for stakeholders and publication deadlines
- Experience working with robots or vehicles in the field and debugging sensors and algorithms in the field

Enquiries: michael.milford@qut.edu.au, t.peynot@qut.edu.au
### 1 Associate Professor / Professor
Robotics, engineering, mining

**Term:** 5 years

We are seeking an internationally leading researcher in the field of engineering, ideally with extensive experience in the mining industry. This position will provide leadership for the Mining3 Automation Program and for the Science and Engineering Faculty, Robotics and Autonomous Systems (RAS) Discipline.

**Enquiries:** jonathan.roberts@qut.edu.au

### 2 x Tenure Track Lecturers / Senior Lecturers in Robotics

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| Professor Jonathan Roberts | 2 x Lecturers / Senior Lecturers  
Robotics, engineering  
**Term:** Ongoing (tenure track) | We are seeking two tenure-track level B/Cs research and teaching academics to join our group. Please contact discipline leader Jonathan Roberts <jonathan.roberts@qut.edu.au> if you are interested. |

**Enquiries:** jonathan.roberts@qut.edu.au