



POSITION DESCRIPTION

School of Computing and Information Systems
Melbourne School of Engineering

(Senior) Research Fellow in Quantum Computing

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| POSITION NO | 0048164 |
| CLASSIFICATION | Research Fellow (Level B) / Senior Research Fellow (Level C) |
| SALARY | \$100,849 - \$ 119,753 (Level B) / \$123,534 - \$142,440 p.a. (Level C) |
| SUPERANNUATION | Employer contribution of 17% |
| EMPLOYMENT TYPE | Fixed-term for 2 years |
| 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 ('Current Staff' or 'Prospective Staff'), then find the position by title or number. |
| CONTACT FOR ENQUIRIES ONLY | Professor Udaya Parampalli < udaya@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 websites:
about.unimelb.edu.au/careers
joining.unimelb.edu.au

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

The appointees will assist the School to explore the potential of Quantum Computation as a future research and teaching area. Quantum computing is the area of study focused on developing computertechnology based on the principles of quantum theory, which explains the nature and behavior of energy and matter on the quantum (atomic and subatomic) level. We have started an exciting collaboration with the School of Physics, Mathematics and IBM to explore this new fascinating field. Tentative targets are two deliver two new subjects in 2020/21 in quantum software (cryptography) and quantum optimisation.

You will conduct independent research, leading to the preparation of teaching a subject and publication of research outcomes in conferences and journals. You will be located in the School of Computing and Information Systems in the Melbourne School of Engineering and will be expected to be an active member of the School, collaborating with other researchers. You may undertake small amounts of teaching as required and will undertake research supervision directly related to your area of research.

The School of Computing and Information Systems 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.

1. Selection Criteria

1.1 ESSENTIAL

- ▶ PhD in Computer Science, or equivalent;
- ▶ The applicant should be familiar with Quantum Computing, in addition to:
 - ▶ Postgraduate qualifications/training and strong research/publication track record in text processing, algorithms or a related area,
 - ▶ Well-developed and demonstrable programming skills for efficient computing on big datasets (e.g. in C/C++ and scripting languages);
- ▶ A track record of quality research as evidenced by research publications in leading conferences and journals. Demonstrated excellence to work as an independent self-directed investigator and as a member of a research team and a commitment to interdisciplinary research;
- ▶ Demonstrated capacity to communicate research concepts to technical and non-technical audiences including an ability to interact with internal and external stakeholders (academic, administrative and support staff) in a professional manner;
- ▶ Excellent ability in analysing data, problem solving and maintaining accurate research records;
- ▶ Demonstrated project management skills, including high level organisational and time management skills, ability to manage competing priorities and excellent record keeping skills;
- ▶ Demonstrated experience in using initiative, working with minimal supervision and ability to prioritise tasks to achieve project objectives within timelines;

- ▶ Demonstrated ability to develop new experimental protocol and simulations;
- ▶ A track record in supervision of Honours and PhD students, and junior staff including post-doctoral researchers and excellence in designing and performing experiments and achieving project objectives.

1.2 DESIRABLE

- ▶ Experience in the LaTeX typesetting tool and associated technologies;
- ▶ A track record of robust, high quality contributions to software projects, e.g., open source contributions;
- ▶ Research experience in modelling or simulation; research experience with medical or clinical data sets;
- ▶ Experience with Noisy Intermediate-Scale Quantum (NISQ) technology.

In addition to the above, expectations from a level C academic are:

- ▶ Excellent written and verbal communication skills, demonstrated by invitations to present at reputed, refereed national/ international conferences meetings, commensurate with experience and opportunities;
- ▶ Excellent communication and interpersonal skills to engage and present information with industry, government, research groups, diverse student cohort and a variety of other stakeholders;
- ▶ Exhibit high levels of motivation and significant leadership within a research group;
- ▶ Experience in successful completions of PhDs with an ability to attract national and international PhD students;
- ▶ Experience in successful completion of ethics applications and submission of grant applications;
- ▶ Well-developed planning and organisational skills including the ability to develop clear project plans and timelines, simultaneously managing staff and projects to effectively balance competing priorities and deadlines.

2. Special Requirements

- ▶ Employment in this position is conditional upon receipt and maintenance of a Working with Children Check.

3. Key Responsibilities

3.1 RESEARCH – EXPECTATIONS FROM A LEVEL B ACADEMIC

- ▶ 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 programme;

- ▶ Perform qualitative and statistical analysis of research data and to communicate this information to the supervisor and collaborators;
- ▶ Regularly write technical reports on the outputs of the experiments conducted, and maintain accurate and detailed records of all experiments conducted;
- ▶ Publish research outcomes on a regular basis by writing in high-impact 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 School's research output;
- ▶ Contribute to the development of the School and the School's strong research program in Quantum Computing;
- ▶ Develop independent research and apply for grants;
- ▶ Perform administrative functions primarily connected with the research project, including generating written summaries of discussions, developing detailed research plans with the project investigators and writing these into a project plan, and contributing to ethics submissions.

3.2 TEACHING AND LEARNING

- ▶ Contribute to teaching, training, scientific mentoring and supervision of students;
- ▶ Supervise junior research staff in the appointee's area of expertise;
- ▶ Conduct lectures, tutorials, mark and undertake laboratory duties as required by the School.

3.3 ENGAGEMENT

- ▶ Present experimental results at local and national, forums;
- ▶ Engage in and contribute to the promotion of the discipline within the Industry, the wider University and external communities;
- ▶ Attend and actively participate in school seminars, meetings and/or committee memberships.

3.4 SERVICE AND LEADERSHIP

- ▶ Undertake administrative duties and general laboratory duties including maintenance of the laboratory and equipment and ordering of supplies;
- ▶ Lead and contribute in the preparation and submission of competitive grant applications relating to the appointee's research program.

3.5 OTHER

- ▶ Perform other tasks as requested by the supervisor or the Head of School;
- ▶ Undertake Occupational Health and Safety (OH&S) and Environmental Health and Safety (EH&S) responsibilities as outlined in Section 5.

In addition to the above, expectations from a level C academic are:

- ▶ Develop a strong program of research with fundamental and application-oriented research consistent with the aims of the project as outlined in the Position Summary;
- ▶ Mentor & develop the research program of Research Fellows, Students and Research Assistants, by planning experimental programs for Research Fellows, students and Research Assistants, and assist other researchers in carrying out experiments in order to work as a team and further the department's research output;
- ▶ Maintain a competitive track record of research achievement leading to commercialisation and continued grant funding, publish papers arising from research conducted; and make presentations at scientific conferences;
- ▶ Act as a source of expert advice on research related to your discipline to CIS staff, key stakeholders and other researchers around Australia;
- ▶ Deliver conference talks and posters at institutional seminars, and national and international forums;
- ▶ Effectively use media outlets to promote and communicate research to the broader community;
- ▶ Collaborate with government and industry partners to commercialise aspects of the research program where appropriate;
- ▶ Contribute to the scholarly practices in the professional community through active involvement which could include liaison with peak professional organisations for the benefit of students and the School;
- ▶ Initiate, manage and maintain significant inter-departmental and institutional collaborations;
- ▶ Liaise effectively with collaborators with a variety of internal and external stakeholders;
- ▶ Perform administrative functions primarily connected with the research project, including generating written summaries of discussions, developing detailed research plans with the project investigators and writing these into a project plan, and contributing to ethics submissions;
- ▶ Lead and contribute to the preparation and submission of competitive grant applications relating to the research program in CIS and publish outcomes in A* peer-reviewed journals;
- ▶ As group leader, be responsible for the project team research, including appropriate management to ensure achievement of milestones, management of project budgets and staff to ensure effective collaboration and outcome;
- ▶ Undertake responsibility for the general oversight of grants associated with the research discipline;
- ▶ Contribute to promotion and maintenance of academic excellence by supporting activities such as the CIS seminar series.

4. 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 service for excellence and reach the targets of Growing Esteem.

5. 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.