



POSITION DESCRIPTION

Centre for Cancer Research
Faculty of Medicine, Dentistry and Health Sciences

Senior Research Engineer

POSITION NO	0043321
SALARY	An attractive salary package will be negotiated including superannuation
SUPERANNUATION	Employer contribution of 9.5%
WORKING HOURS	Full-time
BASIS OF EMPLOYMENT	Fixed-term position available for 4 years Fixed term contract type: Research
OTHER BENEFITS	http://about.unimelb.edu.au/careers/working/benefits
HOW TO APPLY	Online applications are preferred. Go to http://about.unimelb.edu.au/careers , select the relevant option ('Current Staff' or 'Prospective Staff'), then find the position by title or number.
CONTACT FOR ENQUIRIES ONLY	Oliver Hofmann Tel +61 466 366 501 Email oliver.hofmann@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

Position Summary

The University of Melbourne Centre for Cancer Research (UMCCR) has the mission to improve cancer patient outcome through Cancer Genome Discovery, Translation and Personalized Medicine. We seek to recruit a Senior Research Software Engineer to work in close collaboration with the Global Alliance for Genomics and Health (GA4GH) and the Australian Genomics Health Alliance (AGHA) to plan, develop and implement a modern genomics data analysis, management and dissemination environment. We expect having to scale our data manipulation and management systems to match the increasing volumes of biomedical data, providing a challenging and rewarding environment for the appropriate applicant.

Working with colleagues at UMCCR and partners at national and commercial HPC environments the Senior Research Software Engineer will explore federated solutions to track, distribute and analyse large genomic data sets. Experience with cancer genomics is not necessary, but a strong background in software development is. The incumbent will be supporting the analysis of genomic data at scale and should be comfortable developing software for distributed systems.

1. Key Responsibilities

The Senior Research Software engineer will help UMCCR disseminate genomics data generated in clinical settings, grow the Centre's role in applied genomics in an international setting, and support global initiatives in open data sharing and processing. The incumbent will:

- ▶ Collaborate with GA4GH partners on developing cutting edge data and software distribution methods
- ▶ Drive developments in large scale data processing, virtualization and cloud-based system deployment
- ▶ Plan computational strategies to optimally support the Centre's accredited sequencing service
- ▶ Mentor junior staff on topics of software development and bioinformatics
- ▶ Advise UMCCR and UoM leadership on current state of computational requirements for high throughput genomics and future requirements.

The engineer will work closely with international collaborators on all these aspects. The position will also serve as an interface between international initiatives and national consortia such as the Australian Genomics Health Alliance to ensure rapid deployment and dissemination of developed solutions. Based on prior experience the position will also guide the future direction of UMCCR research computing and resource allocation.

2. Selection Criteria

2.1 ESSENTIAL

- ▶ MSc degree in Computer Science or related discipline with 8+ years of experience in software development or an equivalent combination of relevant experience and education in software development with a minimum of 5 years' experience.
- ▶ Fluency in more than one programming language
- ▶ Expert knowledge of at least one major UNIX platform

- ▶ Extensive experience with modern software development approaches and continuous integration testing
- ▶ Experience with commercial cloud environments
- ▶ Evidence of mentorship or staff supervision
- ▶ Excellent time management skills and project planning skills
- ▶ Effective communication and stakeholder management ability

2.2 DESIRABLE

- ▶ Experience with genomics and next-generation sequencing data analysis
- ▶ Expertise in Apache Hadoop, Apache Spark, or other data processing frameworks
- ▶ Familiarity working with remote teams and collaborators in different time zones
- ▶ Contributions to existing or own open source projects
- ▶ Contribution to community events (Hackathons, Codefests, etc.)

2.3 SPECIAL REQUIREMENTS

- ▶ The incumbent may be required to contribute to the Centre's activities out-of-hours.

3. *Job Complexity, Skills, Knowledge*

3.1 LEVEL OF SUPERVISION / INDEPENDENCE

The Senior Research Engineer is expected to operate with considerable autonomy. The incumbent needs to be self-motivated to stay informed about current best practices and likely future developments in software development, sequencing workflows and computational environments. They will independently engage with their peers at national and international sites such as GA4GH, The Broad Institute and other academic and commercial partners to decide and develop technical solutions for sharing genomic data generated at UMCCR. The Senior Research Engineer will independently:

1. Make strategic decisions on software development directions
2. Evaluate novel technologies and their suitability for the Centre's mission
3. Coordinate decisions on software and hardware purchases
4. Decide on future technology developments and resource allocation

They will also guide UMCCR bioinformaticians, junior developers, and research computing staff at UoM and NCI on best practices in software development.

3.2 PROBLEM SOLVING AND JUDGEMENT

The incumbent needs to be able to identify technical bottlenecks and hurdles in software development to allow UMCCR to share and analyze genomics data at scale. They will need to rapidly develop and evaluate software prototypes, deciding which implementations are most

suitable for the Centre's requirements, and test developed solutions in coordination with other international cancer centres. They will synthesize feedback and use the gained knowledge to inform future software development directions. Excellent time management skills and project planning skills are required to ensure software development focuses on the most urgent tasks.

3.3 PROFESSIONAL AND ORGANISATIONAL KNOWLEDGE

The position is expected to have a thorough understanding of best practices in modern software development along with familiarity with both traditional HPC and cloud computing environments. The incumbent will coordinate the development of software for data sharing and analysis with international partners at The Broad Institute (Boston), CRG (Barcelona), UCSC (Santa Cruz) and other open source projects as well as consortia such as the Global Alliance for Genomics and Health. They will interact with peers at national research computing environments to optimize deployed software solutions, and inform UMCCR leadership of identified problems and best ways to resolve them.

3.4 RESOURCE MANAGEMENT

The position will provide guidance on resource allocations of UMCCR funds for software development and operation. They will develop resource plans and work on cost/benefits analysis with peers at UoM, NCI and commercial partners. The incumbent will also independently assess commercial solutions for their suitability and make recommendations to UMCCR and UoM.

3.5 BREADTH OF THE POSITION

Having the capacity to reliably sequence the genomes of cancer patients and integrating the information with the plethora of public cancer genome data is key for the success of UMCCR. The position will make vital decisions on software development and use their expertise in collaboration with national and international partners to implement and deploy these solutions at UMCCR and nationally. The incumbent will engage with initiatives such as GA4GH, driving projects to standardize UMCCR's genomics efforts and aligning them with international best practices.

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.

6. Other Information

6.1 THE UNIVERSITY OF MELBOURNE CENTRE FOR CANCER RESEARCH

The newly formed UMCCR will be responsible for supporting a program of cancer research and education activities across the University of Melbourne in addition to managing University of Melbourne cancer research located in the VCCC facility. The UMCCR will bring together leading researchers, strengthening research capacity and enabling the interdisciplinary collaboration required to understand the complex and intersecting factors that underpin cancer research.

6.2 FACULTY OF MEDICINE, DENTISTRY AND HEALTH SCIENCES

www.mdhs.unimelb.edu.au

The Faculty of Medicine, Dentistry & Health Sciences has an enviable research record and is the University of Melbourne's largest faculty in terms of management of financial resources, employment of academic and professional staff, teaching of undergraduate and postgraduate (including research higher degree) students and the conduct of basic and applied research. The Faculty's annual revenue is \$628m with approximately 55% of this income related to research activities.

The Faculty has a student teaching load in excess of 8,500 equivalent full-time students including more than 1,300 research higher degree students. The Faculty has approximately 2,195 staff comprising 642 professional staff and 1,553 research and teaching staff.

The Faculty has appointed Australia's first Associate Dean (Indigenous Development) to lead the development and implementation of the Faculty's Reconciliation Action Plan (RAP), which will be aligned with the broader University – wide plan. To enable the Faculty to improve its Indigenous expertise knowledge base, the Faculty's RAP will address Indigenous employment, Indigenous student recruitment and retention, Indigenous cultural recognition and building partnerships with the Indigenous community as key areas of development.

6.3 THE UNIVERSITY OF MELBOURNE

Established in 1853, the University of Melbourne is a leading international university with a tradition of excellence in teaching and research. The main campus in Parkville is recognised as the hub of Australia's premier knowledge precinct comprising eight hospitals, many leading research institutes and a wide-range of knowledge-based industries. With outstanding performance in international rankings, the University is at the forefront of higher education in the Asia-Pacific region and the world.

The University employs people of outstanding calibre and offers a unique environment where staff are valued and rewarded.

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

6.4 GROWING ESTEEM, THE MELBOURNE CURRICULUM AND RESEARCH AT MELBOURNE: ENSURING EXCELLENCE AND IMPACT TO 2025

Growing Esteem describes Melbourne's strategy to achieve its aspiration to be a public-spirited and internationally-engaged institution, highly regarded for making distinctive contributions to society in research and research training, learning and teaching, and engagement. <http://about.unimelb.edu.au/strategy-and-leadership>

The University is at the forefront of Australia's changing higher education system and offers a distinctive model of education known collectively as the Melbourne Curriculum. The new educational model, designed for an outstanding experience for all students, is based on six broad undergraduate programs followed by a graduate professional degree, research higher degree or entry directly into employment. The emphasis on academic breadth as well as disciplinary depth in the new degrees ensures that graduates will have the capacity to succeed in a world where knowledge boundaries are shifting and reforming to create new frontiers and challenges. In moving to the new model, the University is also aligning itself with the best of emerging European and Asian practice and well-established North American traditions.

The University's global aspirations seek to make significant contributions to major social, economic and environmental challenges. Accordingly, the University's research strategy *Research at Melbourne: Ensuring Excellence and Impact to 2025* aspires to a significant advancement in the excellence and impact of its research outputs.

<http://research.unimelb.edu.au/our-research/research-at-melbourne>

The strategy recognises that as a public-spirited, research-intensive institution of the future, the University must strive to make a tangible impact in Australia and the world, working across disciplinary and sectoral boundaries and building deeper and more substantive engagement with industry, collaborators and partners. While cultivating the fundamental enabling disciplines through investigator-driven research, the University has adopted three grand challenges aspiring to solve some of the most difficult problems facing our world in the next century. These Grand Challenges include:

- ▶ Understanding our place and purpose – The place and purpose grand challenge centres on understanding all aspects of our national identity, with a focus on Australia's 'place' in the Asia-Pacific region and the world, and on our 'purpose' or mission to improve all dimensions of the human condition through our research.
- ▶ Fostering health and wellbeing – The health and wellbeing grand challenge focuses on building the scale and breadth of our capabilities in population and global health; on

harnessing our contribution to the 'convergence revolution' of biomedical and health research, bringing together the life sciences, engineering and the physical sciences; and on addressing the physical, mental and social aspects of wellbeing by looking beyond the traditional boundaries of biomedicine.

- ▶ Supporting sustainability and resilience – The sustainability and resilience grand challenge addresses the critical issues of climate change, water and food security, sustainable energy and designing resilient cities and regions. In addition to the technical aspects, this grand challenge considers the physical and social functioning of cities, connecting physical phenomena with lessons from our past, and the implications of the technical solutions for economies, living patterns and behaviours.

Essential to tackling these challenges, an outstanding faculty, high performing students, wide collaboration including internationally and deep partnerships with external parties form central components of Research at Melbourne: Ensuring Excellence and Impact to 2025.

6.5 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 <http://www.unimelb.edu.au/governance>