

Position Description – Research Assistant

Position Details

Position Title: Research Assistant

College/Portfolio: STEM

School/Group: School of Science/CAN/ARC E2Crop Hub

Campus Location: Primarily based at City campus, and the potential to work across other RMIT campuses as required.

Classification: Academic Level A

Time Fraction: 1.0

Employment Type: Fixed Term

Fixed Term Reason: Research

Reporting Line: Distinguished Professor Baohua Jia

No. of Direct reports: 0

RMIT University

RMIT is a global university of technology, design and enterprise, committed to creating transformative experiences for students and making a meaningful impact through research, innovation, and engagement. For more information on RMIT University follow the links below.

<https://www.rmit.edu.au/about>

<https://www.universitiesaustralia.edu.au/university/rmit-university/>

<https://www.rmit.edu.au/about/facts-figures>

Our campuses in Melbourne (City, Brunswick, Bundoora, and Point Cook) are complemented by international campuses in Vietnam and a centre in Barcelona, Spain. We proudly acknowledge the Woi Wurrung and Boon Wurrung peoples of the eastern Kulin Nation on whose unceded lands our campuses are located.

We are deeply committed to reconciliation and Indigenous self-determination, embedding these values throughout our policies, culture and structures.

<https://www.rmit.edu.au/about/our-locations-and-facilities>

Why Join RMIT?

Our people are at the heart of everything we do. At RMIT, we value innovation, collaboration and impact. Our values are the heart (durrung) of who we are and what we stand for at RMIT. They guide what we do, how we make decisions, and how we treat each other.



Inclusion Imagination Integrity Courage Passion Impact

Learn more about our values: <https://www.rmit.edu.au/about/our-strategy/values>

Organisational Accountabilities

RMIT is committed to the safety, wellbeing and inclusion of all staff and students. As a staff member, you are expected to comply with all relevant legislation and RMIT policies, including those related to: Equal opportunity, Occupational health and safety, Privacy and trade practices & Child safety standards:

Appointees are responsible for completing all required training and ensuring that they and their team members remain up to date on relevant compliance obligations.

Staff are expected to understand and support RMIT's child safe practices as part of their professional responsibilities. More about our child safety commitment: <https://www.rmit.edu.au/about/our-locations-and-facilities/facilities/safety-security/child-safety>.

Leadership at RMIT

At RMIT, leadership is not defined by position or hierarchy—it is a shared responsibility demonstrated by all staff, regardless of role or title. Leadership is grounded in our six core values, which guide and shape how we work together, make decisions, and create impact.

Effective leadership means consistently integrating these values into everyday actions and interactions, whether influencing a project outcome, supporting a colleague, or leading a team. All staff are expected to embody the principles of the *Be-Know-Do* Leadership Model:

Be – We are open and authentic, inclusive and empowering. We are purpose driven role models and communicators.

Know – We are self-aware, and understand our stakeholders, our sector and priorities.

Do – We set clear direction and expectations, we develop ourselves and others and promote mutual accountability to deliver results.

At every level, leadership at RMIT is about influence, contribution, and mindset. It is reflected in how we empower others, foster collaboration, and drive positive change through capability-building and alignment to strategic goals.

College/Portfolio/Group

ARC E2Crop Hub

The ARC Research Hub for Intelligent Energy Efficiency in Future Protected Cropping (E2Crop Hub) is an Australian Research Council (ARC) supported major initiative which aims to pioneer solutions in renewable energy, plant quality enhancement, intelligent greenhouse monitoring and analysis to drive forward the vast potential of protected cropping.

The Hub is led by RMIT University and includes researchers from 3 other Australian universities.

Working alongside 12 industry partners over a five-year research program, the Hub will focus on delivering advanced energy technologies for greenhouses, enabling them to be self-sustained, affordable, and powered by renewable energy, and new automated decision-making techniques for farmers.

<https://e2crophub.com/>

Centre for Atomaterials and Nanomanufacturing (CAN)

CAN was established to enable the conception, design, theoretical modelling, synthesis and characterisation of the next-generation atomic-scale materials (atomaterials), and development of transformative technologies of such novel materials.

The Centre is a world leader in innovative and emergent materials science, with strong ties to fundamental science and industrial applications. It revolutionises the current fields of materials design, nanofabrication, and atomic characterisation by restructuring the most fundamental material building blocks at the atomic level.

These outcomes will lay a solid foundation for the next generation of functional materials and miniaturised devices, outperforming macroscale materials/devices on detection accuracy, energy efficiency and production efficacy.

<https://www.rmit.edu.au/can>

Position Summary

We are seeking a visionary engineer to revolutionize how optical devices are created by bridging the gap between fundamental physics and modern artificial intelligence. In this role, you will move beyond traditional trial-and-error design methods to leverage generative AI, inverse design, and physics-informed neural networks (PINNs) for discovering novel photonic geometries and maximising performance efficiency for next-generation optical devices.

Your primary responsibilities will include developing and deploying deep learning models, such as GANs, VAEs, and Transformers, to generate, optimise and fabricate photonic integrated devices and metasurfaces. You will create automated workflows that link electromagnetic solvers like Lumerical FDTD or COMSOL with machine learning frameworks to generate high-fidelity training datasets. By utilising gradient-based topology optimization and adjoint methods combined with AI, you will discover non-intuitive device geometries that outperform traditional human designs. Additionally, you will use AI to predict and mitigate complex multi-physics constraints, including thermal crosstalk, fabrication tolerances, and optical nonlinearity in real time. A key deliverable will be building internal software tools that empower the wider design team to utilize your pre-trained models for rapid prototyping.

This role offers the opportunity to define the future at the bleeding edge where computational power meets the speed of light. You will have access to state-of-the-art GPU clusters and proprietary fabrication facilities, and your designs will directly enable transformative applications.

Key Accountabilities

RMIT University is committed to the health, safety and wellbeing of its staff. RMIT and its staff must comply with a range of statutory requirements, including equal opportunity, occupational health and safety, privacy and trade practice. RMIT also expects staff to comply with its policy and procedures, which relate to statutory requirements and our ways of working.

RMIT is committed to providing a safe environment for children and young people in our community. Read about our commitment and child safe practices. <https://www.rmit.edu.au/about/our-locations-and-facilities/facilities/safety-security/child-safety>

Appointees are accountable for completing training on these matters and ensuring their knowledge and the knowledge of their staff is up to date.

1. Conduct research/scholarly activities under limited supervision either independently or as a member of a team including: publishing and presenting research outputs at conferences and research forums; contributing to external research funding submissions; participating in supervision of higher degree by research candidates.
2. Design and develop integrated photonic circuits for sensing, communication, and control; miniaturised optical systems and lab-on-chip platforms; spectral and optical field engineering solutions
3. May undertake limited teaching and supervision at undergraduate levels as required.
4. Undertake administration related to the position.
5. Other duty as directed.

Key Selection Criteria

1. Deep understanding of waveguide optics, light-matter interaction, and plasmonics

2. Proficiency with electromagnetic simulation tools (e.g., Lumerical FDTD/MODE, COMSOL Multiphysics, Ansys HFSS, or Meep)
3. Familiarity with Photonic Integrated device design flow and foundry PDKs (Silicon Photonics, SiN, or III-V)
4. Strong proficiency in Python and machine learning frameworks (PyTorch, TensorFlow, or JAX)
5. Experience with photonic design techniques and global optimisation algorithms (Genetic Algorithms, Particle Swarm, Gradient Descent)
6. Experience implementing deep learning architectures relevant to physics, such as CNNs for image-based field prediction, Graph Neural Networks (GNNs), or Physics-Informed Neural Networks (PINNs)
7. Solid grasp of numerical methods, partial differential equations (PDEs), and linear algebra
8. Experience with high-performance computing (HPC) or cloud-based simulation acceleration
9. Experience with integrated photonic device fabrication and light-matter interactions
10. Evidence of research output including high quality publications, conference contributions and/or technical reports in the field.
11. Ability to generate alternative funding projects through effective liaison with industry and government.
12. Ability to work autonomously whilst displaying a strong commitment to work in a team environment, including the demonstrated ability to confidently and effectively work with colleagues, project team leaders, and industry partners.
13. Demonstrated ability to meet deadlines and effectively manage varying workloads and respond to changing priorities as required.
14. Demonstrated high level of communication skills.

Qualifications

Mandatory:

1. Ph.D. degree in Optical engineering, Applied Physics, or Computer Science
2. Publication record in top-tier journals, demonstrating the application of machine learning to physical problems
3. Experience with surrogate modelling to replace computationally expensive simulations
4. Knowledge of lithography limitations and design-for-manufacturability (DFM).
5. Problem-solving abilities for determining innovative solutions to the complex problems common to photonics design and fabrication.
6. Attention to detail for ensuring precision in coding and model training – and enhancing the accuracy and reliability of AI modelling and data quality.
7. Collaborative skills for working effectively with data scientists, software developers, and project managers.
8. Adaptability, including a willingness to stay updated with the rapidly evolving field of frontier research and learn new techniques and technologies as they emerge.
9. Communication skills for explaining technical project requirements, progress, and outcomes to non-technical stakeholders

Working with Children Check

Appointment to this position is subject to holding a valid Victorian Working with Children Check and other checks as required by the specific role. Maintaining a valid Working With Children Check is a condition of employment at RMIT.