

Position Description – Research Associate

Updated 26/05/2025

POSITION DETAILS	
College/Portfolio	College of Science and Engineering
Organisational Unit	Data and Information Science / Engineered Systems
Supervisor (Title)	Lecturer
Classification	Research Academic Level A
Employment Type	Fixed-term, Full-time

POSITION SUMMARY

We are seeking a motivated Research Associate fellow to contribute to an interdisciplinary project aimed at developing and evaluating a state-of-the-art digital twin platform for green energy generation. This digital twin platform will integrate machine learning models and engineering-based simulations with real-time sensor data to optimise the performance and reliability of several interconnected green energy systems, including wind turbines and solar panel arrays. This is a multidisciplinary, high-impact research opportunity situated at the intersection of AI, energy systems, industrial automation, and sustainability.

The incumbent will work under the general to broad direction of the project's principal investigator (PI) team, which comprises a mixture of expertise areas including data science, electrical / mechanical engineering, renewable energy production, and industry transformation. The incumbent will be required to identify suitable research directions and steps to achieve the project's overall goals, and report on their progress at regular intervals to the PI team. In addition to developing and evaluating the intended digital twin system, the incumbent will work with the PI team to prepare and submit high quality academic publications on their findings.

The incumbent will also be required to provide informal mentoring and guidance to a small number of students involved in the research project, according to the University's policies, practices and standards.

UNIVERSITY EXPECTATIONS AND VALUES

All staff at Flinders are responsible for understanding their obligations and responsibilities as set out in the University's code of conduct and are expected to:

- demonstrate commitment to the University's values of Integrity, Courage, Innovation, Excellence, and the underlying ethos of being Student Centred;
- contribute to the efficient and effective functioning of the team or work unit to meet the University's objectives. This includes demonstrating appropriate and professional workplace behaviours, providing assistance to team members, if required, and undertaking other key responsibilities or activities as directed by one's supervisor;
- promote and support an inclusive workplace culture which values diversity and embraces the principles of equal opportunity;
- perform their responsibilities in a manner which reflects and responds to continuous improvement; and
- familiarise themselves and comply with the University's Work Health and Safety, Injury Management and Equal Opportunity policies.



KEY POSITION RESPONSIBILITIES

The Research Associate is accountable for:

- 1) Contributing to the development of a modular digital twin platform integrating IoT sensor data, ML algorithms, and energy system modelling / simulation.
- 2) Assisting in training and validating ML models for:
 - a) energy output prediction for both wind and solar generation systems;
 - b) anomaly detection for predictive maintenance;
 - c) decision-making support for improving energy management.
- 3) Developing engineering-based simulations to understand operational impacts on energy output and maintenance needs.
- 4) Utilising energy production and maintenance models/simulations to optimise turbine and solar array design and/or deployment
- 5) Conducting scenario-based evaluation procedures to test platform resilience against synthetic disruptions, such as component or sensor failures, grid faults and extreme weather events.
- 6) Preparing technical documentation, research publications, and contributing to final project reporting and presentations.
- Contributing to the coordinating, planning and executing the project tasks required to collaborate with industry partners.
- 8) Any other responsibilities in line with the level of the position as assigned by the Supervisor and/or the University.

A National Police Certificate which is satisfactory to the University will be required by Flinders University before the successful applicant can commence in this position.

KEY POSITION CAPABILITIES

Essential:

- Completion of a PhD in Computer Science, Engineering, Data Science, or a related field.
- Demonstrated research experience in terms of academic publications at a national and/or international level in a relevant field.
- Demonstrated practical experience in at least two of the following areas: machine learning, energy system modelling and simulation, or digital twin systems.
- Proficiency in programming languages (e.g., Python, MATLAB, or similar) and experience with data analysis or simulation tools.
- Strong written and verbal communication skills, with the ability to produce clear technical documentation.
- Demonstrated ability to critically review the literature in relevant fields.
- Well-developed interpersonal skills and the capacity to collaborate and engage with diverse stakeholders and industry partners.

Desirable:

- Experience with IoT sensor platforms and data acquisition systems.
- Understanding of renewable energy technologies, particularly wind or solar generation.
- Familiarity with scenario testing or fault analysis frameworks.