HDR Project with Rio Tinto under the

‘Safe Sustainable Accessible Railways - Graduate Research Industry Partnerships’ (S^{2}ARail GRIP)

TOPIC: Strategy for optimising battery life-cycles

BRIEF PROJECT DESCRIPTION

This project aims to construct a set of modelling tools to allow predictions of battery life in defined use cases, optimisation of use cases, and optimisation of transitions between applications. This project links to existing work in renewable energy modelling and extends the field by including the capability to model battery degradation and changing use cases. The project will involve construction of a generic computer model of a battery system, comparison of the modelled outputs with the performance of actual batteries measured on a laboratory facility simulating different use cases and a comparison of optimised and non-optimised battery lifetime performance.

INDUSTRY PARTNER

The project will be conducted in collaborations with the industry partner Rio-Tinto. The project will require regular collaborative work with various teams at Rio Tinto Iron Ore, including the Rail Engineering & Strategy, Renewable Energy and Research and Development teams, who are based in Perth, Western Australia.

SCHOLARSHIP & PROFESSIONAL DEVELOPMENT

Scholarship: $40,000 p.a. 3.5 years full-time rate (pro-rata). The faculty of Engineering will provide Tuition fee scholarship and overseas student health cover (OSHC) for overseas students.

Professional development: As part of the Monash Doctoral Program, S^{2}ARail GRIP students will complete a minimum of 120 hours of professional development training.

SUPERVISORS

Academic supervisors:

- Dr. Parama Chakraborty Banerjee, Department of Chemical and Biological Engineering, Faculty of Engineering
- Associate Prof. Roger Dargaville, Monash Energy Institute and Department of Civil Engineering, Faculty of Engineering
- Prof. Sankar Bhattacharya, Department of Chemical and Biological Engineering, Faculty of Engineering

Industry supervisor:

- Dr. David Rollinson, Rio Tinto, Energy Storage and Operational Readiness
- Dr. Srikanth Chakravartula Srivatsa, Monash Institute of Railway Technology, Faculty of Engineering

ELIGIBILITY & APPLICATION INFORMATION

Applicants will be considered provided they fulfil the criteria for PhD admission at Monash University and demonstrate excellent research capability. Details of the relevant requirements are available at https://www.monash.edu/graduate-research/future-students/apply

Candidates will also be required to meet Monash University's minimum English language proficiency requirements for entry into a higher degree by research program.

Applications who meet the following criteria will be prioritised:

- Have authored peer-reviewed research publications
- Possess excellent written and verbal English skills

Note: Applicants who already hold a PhD degree will not be considered.

Specific Eligibility Requirements:

- An H1 (first class) or H1 equivalent honours degree and/or a Master's Degree in Chemical Engineering or Electrical Engineering or related fields.
- Evidence of data modelling and analysis, and interpretation skills.
- Research background/experience in battery research.
- Excellent analytical skills and experience in statistical analysis.
- Excellent written and verbal communication skills.
- Ability to work independently as well as in a team.
- Ability to plan, organise, manage multiple tasks and meet deadlines.

The successful scholarship holder must be enrolled full-time and must be on-campus for a minimum of 50% of their time. Shortlisted candidates will be interviewed, over Zoom if necessary. The interviews will be conducted in English.

To Apply: Submit an online EXPRESSION OF INTEREST

EOIs should comprise:

- A cover letter that includes a brief statement of the applicant's suitability
- A curriculum vitae, including a list of published works
- A full statement of academic record, supported by scanned copies of relevant certified documentation
- Contact details of two academic referees
- Evidence of English-language proficiency (international applicants only)

Closing Date: Applications will close once suitable candidate has been identified

The successful candidate must be able to enrol in the degree by no later than March 31, 2024

FACULTIES INVOLVED

Engineering

CONTACT DETAILS & ADDITIONAL INFORMATION

- Dr Parama Chakraborty Banerjee. Email: parama.banerjee@monash.edu
- Faculty Graduate Research Office. Email: eng-gradresearch@monash.edu
- S2ARail GRIP. Email: S2ARail-GRIP@monash.edu