THE UNIVERSITY of ADELAIDE

Faculty of Engineering, Computer and Mathematical Sciences

FBI CRC PHD SCHOLARSHIP ON MINE ELECTRIFICATION – ENERGY AND STORAGE INFRASTRUCTURE DESIGN

Up for a challenge? Join us to work on a research project with the School of Electrical & Electronic Engineering

At a Glance

Who can apply?

- Australian Citizens
- Permanent Residents
- Onshore & Offshore International students

Industry partner or funding body

- Future Battery Industry (FBI) CRC

Program of Study available

- Doctor of Philosophy (PhD)

Total annual stipend amount

- $35,000pa stipend + $5,000pa research allowance (e.g., conference/publication fees etc.)

Start date

- Plan for a start date of no later than December 2021.

About the FBI CRC

This scholarship is funded by the Future Battery Industries Cooperative Research Centre *(FBICRC)* as part of the 'Assessment, design and operation of battery-supported electric mining vehicles and machinery' project. The FBICRC brings together over 60 industry participants, eight universities, CSIRO and Federal and State Governments. Through a six-year research and development program, the FBICRC will target all segments of the battery value chain and deliver commercial, proprietary outcomes to accelerate industry expansion and grow a vibrant, emerging battery industry sector. FBICRC scholarship holders will form part of the broader FBICRC community, participating in research and participant forums with opportunities to undertake industry internships and collaborate with a range of industry and research participants.

Project Background

Mining is a critical industry in Australia. About 30-50% of the total mine site energy usage is related to diesel-powered mining vehicles. This represents a significant proportion of current mining operational costs and the prevalence of diesel fuel usage presents a significant health and safety concerns. The mining industry is also under pressure from governments, investors, and society to reduce their share of 4 to 7% of greenhouse gas (GHG) emissions globally. The use of

electric vehicles and machinery combined with partial or stand-alone renewable energy powered microgrids provides a pathway to more efficient, sustainable and safer mining operations.

About the PhD Project

This project, led by the University of Adelaide, is expected to provide the Australian mining industry with a suite of decision-making tools and information that will aid their transition towards the use of battery-supported electric vehicles (BEVs) and associated stationary machinery in their mining operations.

In this PhD project, we want to design the backbone energy and storage infrastructure required for the 24/7 operation of a BEV mobile fleet considering the unique environmental and operational conditions of two actual mine sites, redundancy and reliability requirements. In addition, the project will develop an optimal framework for technology selection, sizing and scheduling of hybrid energy systems. Various options from grid connection reinforcement, renewable energy sources and different storage technologies will be considered in the technology selection study.

This is a multi-disciplinary research project at the intersection of power system engineering, optimisation and grid/component modelling. Your contributions to this work would help a critical industry achieve its net-zero emission goal and cost reduction with a tangible impact on the climate and health of mining workers.

Eligibility criteria

Candidates with **an Australian equivalent first-class honours degree** (or a master's degree) in electrical engineering, operations research, applied mathematics, or computer science are encouraged to apply. We are looking for excellent candidates with proven skills and knowledge in:

- Power systems engineering, hybrid energy system sizing and operation and integration of storage into the grid
- Mathematical optimisation, preferably with applications to power system
- Programming in Python or MATLAB

Applicants with well-developed written and verbal communication skills will be considered favourably.

Students applying for this scholarship should plan for a start date no later than 23/12/2021.

You should be willing to provide your personal details by way of a Student Deed Poll.

Benefits

- Contribute to solutions that reduce GHG emission of the mining industry
- Work alongside world-leading researchers
- Exposure to key industry networks and experts in the field
- Research allowance for conference attendance and other legitimate expenses related to your PhD research
- Our CaRST program: professional development to enhance your employability skills
- No tuition fees! These are waived for eligible candidates
- Access to state of the art technology
- Become an expert in the field and make a real contribution to solving global challenges
- Publish your contributions and impact our community and society.

How to apply

- Complete an expression of interest and email together with a copy of your CV and transcript(s) to a.pourm@adelaide.edu.au
- Once your initial eligibility assessment is approved, formally lodge an application for 'admission only' via the Adelaide Graduate Centre 'How to Apply' link. **Application dates are listed on the website.**

More about ECMS

The Faculty of Engineering, Computer and Mathematical Sciences is home to world-class research institutes and centres and internationally renowned academics at the cutting-edge of research and discovery.

We are a thriving centre of learning, teaching and research in a vast range of engineering disciplines, computer science, machine learning and high-level mathematics, and design human-centred, sustainable futures in our School of Architecture and Built Environments.

Many of our academic staff are leaders in their fields and graduates are highly regarded by employers.

Learn more about the Faculty of Engineering, Computer and Mathematical Science's Research capabilities at: https://ecms.adelaide.edu.au/research-impact

The University of Adelaide is an Equal Employment Opportunity employer. Women and Aboriginal and Torres Strait Islander people who meet the position requirements are strongly encouraged to apply.

FURTHER INFORMATION

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