



Sustainable Manufacturing and Life Cycle Engineering Research Group
School of Mechanical and Manufacturing Engineering
The University of New South Wales, Sydney
www.lceresearch.unsw.edu.au

PhD Scholarships

School of Mechanical & Manufacturing Engineering, The University of New South Wales

DISASSEMBLY AUTOMATION OF END-OF-LIFE ELECTRIC VEHICLE BATTERIES

Three PhD scholarships are available to work within the recently commenced ARC Linkage project on Disassembly Automation of End-of-Life (EOL) Electric Vehicle (EV) batteries. International climate targets require immediate emission reduction. In this context electrification of the transportation sector has been seen as a crucial step which accounts for 30% of the total global emission. As a result, it is estimated that global electric car sales may reach 23 million, and the stock may exceed 130 million vehicles by 2030. End of life (EOL) management of these vehicles is a major business opportunity as well as an environmental concern. In this context, disassembly is a critical step in EOL recycling of EV batteries, which is one of the key steps towards closing the material loop and achieving a circular economy. However, disassembly, in particular automated disassembly, of EOL products is challenging due to the lack of information about the product and uncertainties around product volume and condition. ***Therefore, the aim of this project is to develop an integrated disassembly automation solution for EOL EV batteries, which is flexible and modular with learning and reasoning capabilities to handle the uncertainties associated with model changes, and the condition of the EOL battery packs.***

To achieve the project aims, up to three PhD stipends will be offered to work in the following project areas:

- ***PhD Project 1:*** The aim of this sub-project is to develop a cognitive robotic agent with learning by demonstration and reasoning capabilities to handle uncertainties around battery types and conditions.
- ***PhD Project 2:*** The aim of this sub-project is to design, develop and operate a scalable, automated disassembly cell and tooling to address the current volume as well as the projected volume growth in the near future.
- ***PhD project 3:*** The aim of this sub-project is to develop a vision system for safe disassembly of a de-charged battery pack to cell level.

The project will be undertaken through the Sustainable Manufacturing and Life Cycle Engineering Research Group @ UNSW (www.lceresearch.unsw.edu.au) and the associated industry partner organisation. It is expected that the qualified candidates will closely work with the project industry partner to deliver project outcomes



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Applicants should hold an undergraduate degree at Honours 1 or equivalent in one of Mechanical Engineering, Mechatronics, Robotics, Electrical, or Computer Science or allied disciplines. Prior experience with EV batteries will be desirable.

Details

A stipend of \$33,281 per annum (tax-free) will be provided for three years (2022-2025). Additional top-up scholarship of \$10,000 per annum may also be available for qualified candidates. Australian citizens, Australian permanent residents and foreign nationals may apply for this scholarship.

Further information on the project and scholarships on offer may be obtained from Prof. S. Kara (S.Kara@unsw.edu.au). Applications for the scholarship should include the following:

- Cover letter and motivation,
- Academic transcript and/or record, and,
- CV.