Thermal investigation for automotive Lithium-ion batteries
EngD

Funding: £20,053 (for UK/EU nationals) which includes a £4,000 industrial top up, for 4 years
Supervisors: Professor David Greenwood and Dr Rohit Bhagat
Supporting company: Millbrook
Start Date: As soon as possible

Project overview
This is a fantastic opportunity to work with WMG, University of Warwick, the foremost UK facility for battery innovation, research and development, in association with Millbrook, the leading vehicle testing facility for the design, engineering and development of automotive and test technology propulsion systems.

Electrochemical power devices (such as Lithium-ion battery and supercapacitor technology) are ubiquitous for automotive energy storage. They are used on-board vehicles in a wide range of technological applications demanding higher capacity, high rate capability and extended cyclability.

This project focuses on the investigation of thermal behaviour of Lithium-ion batteries. The project will look at how to replicate real world thermal conditions in rig-based battery pack / module / cell tests, including validation and characterisation of heating / cooling systems and their energy consumption, and how this translates into practical, robust testing methods and protocols for commercialisation. You will research into the effects of the vehicle and driving situations on the thermal behaviour of the battery pack, together thermal propagation and management at module and pack level. The research will include post-mortem analysis of batteries following thermal reaction, including abuse testing, and batteries disposal and recycling post-testing, and will also consider the relevant environment and Health & Safety processes to understand, predict and prevent dangerous thermal runaway situations.

As an Engineering Doctorate, this project has a unique relationship between research and industry, with an emphasis on innovation and addressing real world issues, with 50% time split between both organisations. There will be regular knowledge exchange between WMG and Millbrook, you’re your learning and research supervision provided from world-leading WMG academics in this field, alongside senior Millbrook industrial principals. You will have full access to state-of-the-art facilities in WMG’s Energy Innovation Centre at The University of Warwick, the only one of its kind in the UK, alongside Millbrook, one of the UK’s top vehicle testing and proving grounds, with extensive facilities and advanced specialist expertise.

This project can progress depending on your prior experience, and the successful candidate will likely cross the boundaries of several key engineering disciplines including electrochemical energy storage, electrical, electronic and mechanical engineering.

Qualifications:
A minimum of an upper second (2.1) honours degree (or equivalent) in a relevant subject such as electrochemistry, electrical, electronic, or mechanical engineering. Previous industrial experience would be an advantage, with vehicle or component testing.

Funding:
Due to funding regulations, the applicant should be a UK/EU student.
This position provides a 4 year tax free stipend (for UK/EU nationals) plus a £4,000 industrial top up, totalling £20,053.

To apply
If you would like to be considered for this position or have any questions please complete our online enquiry form.