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Future Focus

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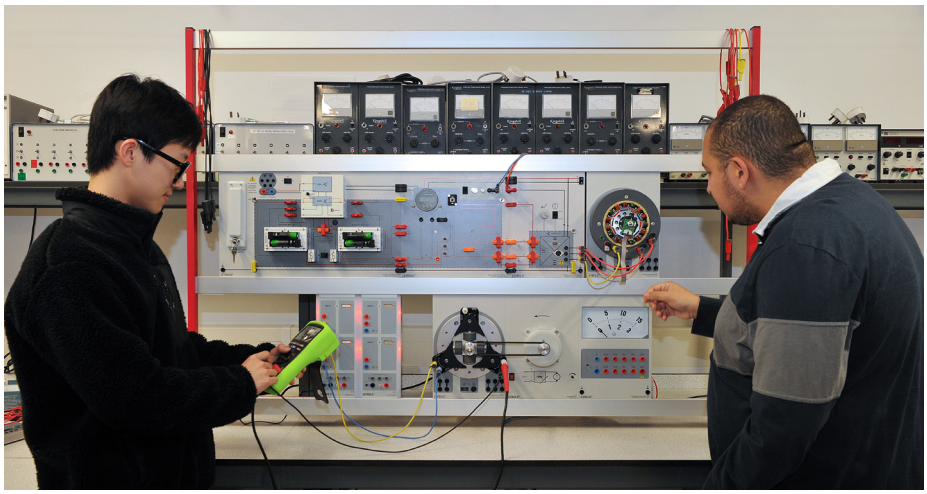

State-of-the-art battery management and electrical drive systems used by two research students for MSc Electric Vehicle Systems

Education in Electric Vehicle Systems

Reported by Dr Chun Sing Lai,
Dr Mohamed Darwish, Prof Maysam Abbod

Electric vehicles (EVs) are key technologies in research and development to decarbonise road transportation. It is a general perception that vehicles are related to automotive technology and vehicular dynamics, which are still relevant today. However, EVs are greatly different as compared to an internal combustion engine vehicle as they use electrical motor for the propulsion and battery as an energy source.

The MSc Electric Vehicle Systems at Brunel University London has been designed to equip advanced students with knowledge of low-carbon electric vehicle systems and advanced battery technologies. Different to a traditional automotive programme, this programme focuses on the key areas of electronic and electrical engineering in relation to electric vehicle systems. These include power electronics and drives, vehicular communication systems, sustainable power systems, intelligent systems, and embedded systems which contributes to the design of electric vehicle charging infrastructure and converter topologies.

> “The UK-Saudi Electric Vehicles Education and Research Network is a game-changing partnership among higher institutions in the UK and Kingdom of Saudi Arabia.”

Students will have access to modern technical facilities including computer, electronics and power and control laboratories, where they work on practical laboratory-based exercises. The latest industry-standard engineering software packages are available to use in our purpose-built computer laboratories.

The interest in EV education is expanding globally and the UK-Saudi Electric Vehicles Education and Research Network is a game-changing partnership among higher institutions in the UK and Kingdom of Saudi Arabia. The focus of the network is on the next generation of EV technologies. The network promotes multidisciplinary collaborations from different engineering departments with the aim of developing new graduates with the knowledge and research skills in the fields of Enhanced Energy Management, Energy Storage, Advanced Power Modules, Next-generation Powertrain, Ubiquitous Charging and Electric Vehicle Opportunities.

The overall goal of this project is to take stock and identify key challenges and constraints for the development and implementation of EV technologies in KSA and propose a successful model for collaboration between universities and industry to prepare young graduates and researchers capable of addressing the challenges of EV technologies. The project activities include faculty and experts exchange and visits, meetings, workshops, seminars, curriculum development, and conferences.

The Department of Electronic and Electrical Engineering has hosted a workshop at Brunel during November 2022 followed by a workshop in King Abdulaziz University in Saudi Arabia during January 2023. Invited speakers from industry and academia included Dr Alaa Alani (Sondrel Ltd), Jerry Stokes (Executive Chairman, GRIDSERVE), Dr Damien Frost (Brill Power), Professor M. E. Farrag, (Glasgow Caledonian University), Professor M. Shafik (University of Derby). In addition to presentations, four engineering students from King Abdulaziz University have participated in electric vehicle range modelling from the MSc programme.

To meet the net-zero target and fulfil national agenda, there will be an industry demand for engineers with specialism in electric vehicle systems. Please contact the programme director Dr Chun Sing Lai for any query on chunsing.lai@brunel.ac.uk.