Newcastle University PhD Studentship award

Title
Reliability Analysis and Condition Monitoring of the Drivetrain of Electric Vehicles

Value of award
100% of International tuition fees paid

Number of awards
1

Start date and duration
September 2019 for 3 years

Application closing date
8th February 2019

Overview
Electric vehicles (EVs) have received substantial investment to support technological development and testing in real world conditions. However, the present uptake of EVs is still far below expectations. This is widely acknowledged to be due to a range of concerns held by potential users, one of which is the reliability and safety of the EVs. The EV uses electricity stored in a battery pack to power an induction or permanent magnet motor via an inverter. Then, the motor turns the wheels via a 2-stage gearbox. Single or multiple ‘inverter-motor-gearbox’ systems are used in an EV depending on different concept designs. But despite the difference in design, the rotation of the four wheels of the EV should be accurately controlled. Otherwise, it is very possible to cause a traffic accident on the motorway and even casualties. However, EVs’ drivetrain is a mechanical-electric-electronic coupled system, which is prone to failure in severe operation environments thus causes the failure of wheel control. According to the World Health Organisation (WHO), nowadays there are 1.24 million people die in road accidents every year, and another 20 to 50 million people sustain non-fatal injuries that can cause permanent impairment. The future increasing use of EVs may further worsen this situation due to unreliability. This motivates the research to improve the reliability and safety of EVs. This project is a part of contribution to attaining this purpose by developing advanced techniques dedicatedly for realising the reliability analysis and condition monitoring of the drivetrain of EVs.

Sponsor
Faculty of Science Agriculture and Engineering and Chinese Scholarship Council (CSC)

Name of supervisor(s)
Dr Wenxian Yang, Professor Volker Pickert, Dr Nick Baker

Eligibility Criteria
- You must be a citizen and permanent resident of the People's Republic of China at the time of application;
- You must have good knowledge and skills of reliability analysis;
You must have good knowledge and skills of signal processing and data analysis;
You are expected to have knowledge of condition monitoring and fault diagnosis;
You are expected to be a team worker with good communication skills.

**How to apply**
You must apply through the University’s online postgraduate application system. [Apply here](#). To do this please ‘Create a new account’. All relevant fields marked with a red asterisk must to be completed.

The following information will help us to process your application. You will need to:
• Insert the programme code **8060F** in the programme of study section
• Select **PhD Electrical and Electronic Engineering (full time) - Electrical & Electronic Engineering** as the programme of study
• Insert the studentship code **CSC1803** in the studentship/partnership reference field
• Attach a covering letter and CV. The covering letter must state the title of the studentship, quote reference code **CSC1803** and state how your interests and experience relate to the project
• Attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications

**Contact**
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