

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Advanced Technology
Supervisors	Principal supervisor: Dr. Bing Han (XJTLU) Co-supervisor: Dr. Shaofeng Lu (SCUT) Co-supervisor: Dr. Fei Xue (XJTLU) Co-supervisor: Dr. Lin Jiang (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Autonomous Electric Vehicles Fleet Management and Charging Station Planning in Future Power Grids
Contact	Please email Bing.Han@xjtlu.edu.cn (XJTLU principal supervisor's email address) with a subject line of the PhD project title. The principal supervisor's profile is linked here: https://www.xjtlu.edu.cn/en/departments/academic-departments/electrical-and-electronic-engineering/staff/bing-han

Requirements:

The candidate should have a first class or upper second class honours degree, or a master's degree (or equivalent qualification), in Electrical Engineering, Applied Mathematics.

Evidence of good spoken and written English is essential. The candidate should have an IELTS score of **6.5 or above**, if the first language is not English. This position is open to all qualified candidates irrespective of nationality.

Degree:

The student will be awarded a PhD degree from the University of Liverpool (UK) upon successful completion of the program.

Funding:

The PhD studentship is available for three years subject to satisfactory progress by the student. The award covers tuition fees for three years (currently equivalent to RMB 99,000 per annum). It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. The scholarship holder is expected to carry out the major part of his or her research at XJTLU in Suzhou, China. However, he or she is eligible for a research study visit to the University of Liverpool up to six months, if this is required by the project.

Project Description:

Autonomous driving is believed to be a disruptive technology that will transform the transportation system in the near future. This research focuses on the AEV fleet management and EV charging station planning problems. The relationship between AEV fleet operator benefits, passenger traveling demands, AEV charging costs, waiting time, and charging station installation costs will be discussed under dynamic transportation conditions, such as road congestion and emergent events. Additionally, this research will investigate the Vehicle-to-Grid (V2G) capability of AEV fleets, which can help improve the resilience and restoration abilities of power grids that integrate renewable energy sources.

Objectives in this project:

- 1) To develop an AEV fleet charging and routing scheduling strategy for a city-level traffic network considering passenger travel demand and road congestion.
- 2) To investigate the V2G capability of an AEV fleet acting as a battery energy storage system (charging and discharging) to enhance power grid resilience and restoration ability under renewable integrations.
- 3) To propose an EV charging station planning strategy coupled with the operation of power and transportation networks considering waiting times for EVs.

Research questions in this project:

- 1) How do traffic conditions affect the profits of AEV fleet operator? The transportation network has several aspects that affect the AEV routing and charging strategy, such as road congestion, emergency events, vehicle fare, and passenger travel demand. These aspects must be addressed in the model.
- 2) What factors can be used to assess the resilience and restoration ability of the power grids under renewable integration? The relationship between the ability of AEV fleet operator in improving resilience and restoration of the power grids with the AEV fleet operator profit need to be modelled.
- 3) How to quantify the waiting time of AEV fleet instead of individual vehicles? The charging waiting time of AEVs is a key factor in evaluating the charging station planning results. The waiting time of AEV fleet should be modelled.

For more information about doctoral scholarship and PhD programme at Xi'an Jiaotong-Liverpool University (XJTLU), please visit

<https://www.xjtlu.edu.cn/en/admissions/global/entry-requirements/>

<https://www.xjtlu.edu.cn/en/admissions/global/fees-and-scholarship>

How to Apply:

Interested applicants are advised to email Bing.Han@xjtlu.edu.cn (XJTLU principal supervisor's email address) the following documents for initial review and assessment (please put the project title in the subject line).

- CV
- Two formal reference letters
- Personal statement outlining your interest in the position
- Certificates of English language qualifications (IELTS or equivalent)
- Full academic transcripts in both Chinese and English (for international students, only the English version is required)
- Verified certificates of education qualifications in both Chinese and English (for international students, only the English version is required)
- PDF copy of Master Degree dissertation (or an equivalent writing sample) and examiners reports available