

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Advanced Technology
Supervisors	Principal supervisor: Professor/Dr Rui Yang (XJTLU) Co-supervisor: Professor/Dr Huiqing Wen (XJTLU) Co-supervisor: Professor/Dr Meng Fang (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Machine learning enhanced multi-objective optimization
Contact	Please email R.Yang@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://scholar.xjtlu.edu.cn/en/persons/RYang

Requirements:

A Master's degree with Merit and a Bachelor's degree with first-class or upper second-class honors are required for PhD admissions. Exceptional candidates holding only a Bachelor's degree may be considered on an individual basis in certain disciplines.

Evidence of good spoken and written English is essential. The candidate should have an IELTS (or equivalent) 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 holders are expected to conduct the majority of their research at XJTLU in Suzhou, China. However, they may apply for a short-term research visit to the University of Liverpool if the project requires it.

Project Description:

Multi-Objective Optimization (MOO) has a wide range of applications in engineering, finance, and environmental management, but its computational complexity and high-dimensional search space limit its efficiency. In recent years, the rapid development of machine learning (ML) technology has provided new solutions for multi-objective optimization. This project aims to explore how to enhance the performance and efficiency of multi-objective optimization using Transformer architecture, Foundation Model, and Deep Transfer Learning technologies. Firstly, the Transformer architecture can effectively capture the complex dependencies in high-dimensional data through its self-attention mechanism, which is suitable for objective function modeling and constraint processing in multi-objective optimization. Secondly, as a pre-trained model, Foundation Model can learn general feature representations from large-scale data, which significantly improves the generalization ability of optimization algorithms, especially in small-sample data scenarios. Finally, deep transfer learning technology can reduce the dependence on target domain data by transferring the knowledge of the pre-trained model to a specific optimization task, thereby accelerating the optimization process and improving the accuracy of the solution.

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 R.Yang@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