PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Intelligent Manufacturing Ecosystem
Supervisors	Principal supervisor: Dr. Zhuo Xu (XJTLU) Co-supervisor: Dr. Akhil Garg (XJTLU) Co-supervisor: Dr. Rosti Readioff (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Intelligent Design Frameworks of Functionally Graded Lattice Structures for Sustainable High-Performance Applications
Contact	Please email Zhuo.Xu@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/loker-xu/

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:

Functionally graded lattice structures (FGLSs) are architected metamaterials whose geometry or relative density varies spatially to tailor stiffness, strength, energy absorption, and other functional responses while minimizing mass. Their broader use is limited by the very large design space, additive-manufacturing constraints and process variability, and incomplete understanding of fatigue and failure mechanisms, especially for ultra-light TPMS/gyroid architectures. This PhD project will develop an AI-assisted, process-aware framework for the intelligent design of FGLSs by combining generative algorithms, machine learning, topology optimization and multi-objective optimization with additive-manufacturing constraints.

The candidate will design and additively manufacture representative graded lattice structures, characterize their geometry and manufacturing quality, and evaluate their quasi-static, cyclic and fatigue behavior. Experimental testing, advanced imaging and digital image correlation will be integrated with finite-element simulation, data-driven modelling and multi-scale analysis to link unit-cell geometry, manufacturing variability, local stress/failure mechanisms and global structural performance. Sustainability metrics such as material efficiency and reduced experimental trial-and-error will be incorporated into the design workflow. The project targets lightweight, durable and high-performance applications in aerospace, automotive, biomedical and protective systems, with expected outputs including validated design guidelines, 2-3 peer-reviewed journal papers, 3-4 conference presentations, prototype demonstrators, curated datasets/software tools and potential invention disclosures.

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/doctoral/entry-requirement-phd
https://www.xjtlu.edu.cn/en/admissions/doctoral/postgraduate-research-scholarships

How to Apply:

Interested applicants are advised to email **Zhuo.Xu@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