PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Mathematics and Physics
Supervisors	Principal supervisor: Dr Hui Zhang (XJTLU) Co-supervisor: Professor Fei Ma (XJTLU) Co-supervisor: Dr Qiang Niu (XJTLU) Co-supervisor: Dr Linglong Yuan (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Randomization and AI Methods for Large Sparse Linear Systems Arising from Applications -- A Hybrid Approach through Schur Complements
Contact	Please email hui.zhang@xjtlu.edu.cn (XJTLU principal supervisor's email address) with a subject line of the PhD project title

Requirements:

The candidate should have a first class or upper second class honours degree, or a master's degree (or equivalent qualification), in mathematics or related fields. 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) and provides a monthly stipend of 5,000 RMB as a contribution to living expenses. It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. It is a condition of the award that holders of XJTLU PhD scholarships carry out 300-500 hours of teaching assistance work per year. 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 of up to six months, if this is required by the project.

Project Description:

Driven by the accuracy and real time requirements of applications, the limit of high performance solvers for large sparse linear systems need to be pushed forward. We recognized the key component of the existing solvers as Schur complements for which some low rank structures have been exploited to improve the efficiency of sparse solvers. But it is manifested in some applications that the current structure has an essential barrier. To address the questions, we propose to find and reveal novel structures of Schur complements based on the existing methods combined with the randomization idea and AI tools. This will potentially lead to a hybrid approach to high performance sparse solvers. We aim to leverage the new structure to attack some challenging problems from applications. In particular, we aim to solve the frequency domain wave problem from geophysics and the physics simulation problem from 3D animation, to an unprecedented scale.

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 hui.zhang@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 reference letters with company/university letterhead
- Personal statement outlining your interest in the position
- Proof of English language proficiency (an IELTS score of 6.5 or above)
- Verified school 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

Informal enquiries may be addressed to Dr. Hui Zhang (hui.zhang@xjtlu.edu.cn), whose personal profile is linked below,
https://www.xjtlu.edu.cn/zh/study/departments/school-of-mathematics-and-physics/applied-mathematics/department-staff/academic-staff/staff/hui-zhang