

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Design
Supervisors	Principal supervisor: Dr ATHANASIOS MAKRODIMOPOULOS (XJTLU) Co-supervisor: Dr THEOFANIS KREVAIKAS (XJTLU) Co-supervisor: Dr LUIGI DI SARNO (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Efficient discretisation schemes in upper bound limit analysis
Contact	Please email A.Makrodimitopoulos@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 Civil Engineering or in a discipline that can be relevant to computational mechanics (e.g. Mechanical Engineering, Applied Mathematics). The candidate must have good analytical skills, understanding of solid mechanics and linear algebra. Programming experience is an advantage and a strong motivation to program finite element codes is necessary. 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 80,000 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:

The development of IT technology combined with the Finite Element Method has provided civil engineers with tools to analyse structures in a rather automatic way. However, in several cases, a fine discretisation, which means a subdivision of the structure into many finite elements (pieces), is required to obtain accurate results. Inevitably this leads to a high amount of data and heavy computational problems. The commercial engineering software's generalised algorithms may not treat the problem efficiently as they are not adapted to specific features of the problem. Alternatively, computational limit analysis is a tool that specialises in calculating the carrying capacity of structures by taking advantage of the recent advances of optimisation algorithms and the problem's specific features. This project will examine the development of efficient limit analysis procedures in order to reduce the necessary CPU time without sacrificing the accuracy of the result. This will require the detection or development of finite elements with suitable properties (i.e. guarantee *a priori* that an upper bound of the limit load can be obtained and still close to the exact solution) and the validation of their efficiency through the development of a finite element code which will be combined with numerical optimization software developed by the mathematician's community (MOSEK, CPLEX, GuRoBi, etc).

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

<http://www.xjtlu.edu.cn/en/study-with-us/admissions/entry-requirements>

<http://www.xjtlu.edu.cn/en/admissions/phd/feescholarships.html>

How to Apply:

Interested applicants are advised to email A.Makrodimitopoulos@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 Athanasios Makrodimopoulos (A.Makrodimopoulos@xjtlu.edu.cn), whose personal profile is linked below,
<https://www.xjtlu.edu.cn/en/staff?department=civil-engineering&alias=a-makrodimopoulos>