PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	Design School
Supervisors	Principal supervisor: Dr Guobin Gong (XJTLU) Co-supervisor: Dr Xiaojing Zhang (JITRI) Co-supervisor: Dr Zhongkui Chen (JITRI) Co-supervisor: Dr Haopeng Wang (UoL) Co-supervisor: Dr Sebastiano Fichera (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project
Project Title	Research and Application of Plastic Behavior and Constitutive Model of Thin Plate Metal Materials
Contact	Please email guobin.gong@xjtlu.edu.cn (XJTLU principal supervisor's email address) or zhongkui.chen@im-simtec.cn 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 mechanical engineering, applied mechanics, materials science, computer science 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.

Please note that the joint PhD project is industry-based and the candidate is expected to undertake part of the research at the partner organization in China.

Degree:

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

Funding:

This PhD project is a collaborative research project between XJTLU (http://www.xjtlu.edu.cn) in Suzhou and JITRI (Jiangsu Industrial Technology Research Institute) XiMu Intelligent Manufacturing (Suzhou) Co. Ltd. The student will be registered as an XJLTU PhD student but is expected to carry out the major part of his or her research at the Institute in XiMu Intelligent Manufacturing (Suzhou) Co. Ltd.

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). In addition, during the period of undertaking main research at the institute in Suzhou, the PhD candidate will be provided with monthly living allowance at a standard of 5000 RMB per month (up to four years) by XiMu Intelligent Manufacturing (Suzhou) Co. Ltd.

Project Description:

Thin sheet metal materials have extensive applications in modern engineering fields. The study of their plastic behavior and constitutive models plays an important role in optimizing manufacturing processes and enhancing product quality. This PhD research aims to delve into the plastic behavior of thin sheet metal materials, with a target to develop advanced constitutive models, which are expected to be incorporated in industry CAE Software and applied in practical engineering projects.

Firstly, fundamental concepts of the plastic behavior of thin sheet metal materials will be reviewed, including yield points, yield surfaces, hardening rules etc. Through summarizing and analyzing existing research outcomes, a comprehensive plastic behavior model for thin sheet metal will be constructed, aiming for a more accurate prediction of material deformation responses under various loading conditions.

Next, the development of constitutive models will be undertaken. Taking into account of material's anisotropy, nonlinearity, and other characteristics, an extensive constitutive model for thin sheet metal will be proposed and established. By collecting and analyzing experimental data, model parameters will be optimized to align more closely with the actual mechanical behavior of materials.

Finally, the developed plastic behavior and constitutive model will be implemented into a finite element program to simulate engineering problems. Through numerical simulations and experimental validations, the accuracy and feasibility of the models will be verified. Applications will be carried out in fields such as automotive manufacturing and aerospace to optimize product designs, reduce manufacturing costs and enhance product performances.

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/feesscholarships.html

Supervisor Profile:

Principal Supervisor:

Dr. Guobin Gong is an associate professor in civil engineering at Xi'an Jiaotong-Liverpool University (XJTLU). He obtained his first degree and master degree in civil engineering both from Hua Zhong University of Science and Technology (HUST) in China, and then a PhD in geotechnical engineering from the University of Birmingham (UK) in 2008. He worked in consultant companies including Mott MacDonald Limited (head office in London) and URS-Scott Wilson (Hong Kong office). He also worked in Harbin Institute of Technology (Shenzhen, China) as an academic fellow before joining XJTLU. His research interests include micromechanics of granular materials, soil liquefaction, constitutive elastic-plastic models, structural dynamics and vibration, concrete filled steel tubes, finite element method and discrete element method.

JITRI co-supervisor:

Dr. Xiaojing Zhang is a high-level national talent in China. He obtained a PhD in manufacturing engineering from Beihang University. He has been engaged in the research of finite element algorithms on sheet metal forming and commercial codes development of large-scale industrial software, as well as the research of intelligent tooling manufacturing. In 2015, he established SIMTEC Engineering GmbH in Germany, which is specially focusing on the research on advanced RDSC intelligent tooling manufacturing and manufacturing technologies for aluminum alloy lightweight materials. In 2021, he came to Suzhou to establish XiMu Intelligent Manufacturing (Suzhou) Co., Ltd. and XiMu Intelligent Manufacturing (Suzhou) Research Institute. He has ever collaborated with Professor Dorel Banabic and published a monograph titled 'Sheet Metal Forming Processes, Constitutive Modeling and Numerical Simulation', which has received some attention and was translated into Russian, Romanian, and Chinese for reprint.

JITRI co-supervisor:

Dr. Zhongkui Chen is Deputy Dean of XiMu Intelligent Manufacturing (Suzhou) Research Institute. He graduated from Beihang University and obtained bachelor's degree of Applied Mathematics, master and PhD in Manufacturing Engineering of Aerospace Vehicle in 1994, 1997 and 2001 respectively. In 2002, he worked as a postdoctoral researcher in the department of Mechanical Engineering at Tianjin University. Then from 2003 to 2012, he was engaged in research on computer numerical simulation technology for electronics in Motorola and Nokia. Dr. Zhongkui Chen's main research directions are computer numerical simulation and virtual reality,

both including CAD/CAM/CAE, human-machine interaction, virtual reality, graphic image processing, and flexible electronic sensors involved in his career. He ever led the design and development of the early China domestic sheet metal forming simulation software SheetForm based on static implicit algorithm, and proposed some computing model and algorithms. The model algorithm has achieved good results in practical numerical simulation applications.

How to Apply:

Interested applicants are advised to email guobin.gong@xjtlu.edu.cn or zhongkui.chen@im-simtec.cn 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 if available