

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	School of Advanced Technology.
Supervisors	Principal supervisor: Dr. Xiaohui Zhu (XJTLU) Co-supervisor: Professor/. Yong Yue(XJTLU) Co-supervisor: Dr. Haopeng Wang(UoL) Co-supervisor: Prof. Weiping Ding (NTU)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Human-in-the-loop Planning and Control for Multi-Robot Systems
Contact	Please email Xiaohui.zhu@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: Xiaohui Zhu — Xi'an Jiaotong-Liverpool University (xjtlu.edu.cn)

Requirements:

The candidate should have a first class or upper second class honours degree, or a master's degree (or equivalent qualification), in computer science or related majors.

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). It also provides up to RMB 16,500 to allow participation at international conferences during the period of the award. 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 for up to six months, if this is required by the project.

Project Description:

Traditional paradigms of shared control have heavily relied on humans to provide precise and accurate inputs to robots, or they have reduced the role of humans in providing supervisory task specifications. In this project, we will explore novel algorithms and techniques of human-in-the-loop (HITL) planning and control for multi-robot systems (MRS) for object transportation. The research will enable multiple robots to perform mobile manipulations in dynamic and unknown environments that maximize the strengths of the human and robot at optimal efficiency. The MRS is expected to (semi-)autonomously perform task manipulation empowered with artificial intelligence (AI). When it comes to critical tasks, the HITL intervention can perform complex operations to maximize human-machine hybrid intelligence. The research outputs will significantly enhance the efficiency of the human-robot systems and reduce the human supervisory workload for collaborative tasks.

There are three specific objectives of this research:

- (1) Conducting a comprehensive review of the current state-of-the-art work on HITL-based planning and control for MRS. Key problems of HITL planning and control that achieve intuitive, intelligent, safe, and efficient transportation tasks with MRS will be identified;
- (2) Designing, developing, testing, and deploying novel algorithms of motion plan, HITL approach, and MR-based teleoperation methods for MRS on both simulation platforms and on-site experiments with a user study to evaluate the task performance based on practical scenarios;
- (3) Developing a multi-robot simulator and a HITL interface with contemporary platforms such as Unity and ROS for rapid testing and AI training as well as a benchmark tool for this research area.

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.....@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