

PhD studentship (Full-time)

Institution	Xi'an Jiaotong-Liverpool University, China
School	SAT.....
Supervisors	Principal supervisor: Dr. Along Jin (XJTLU) Co-supervisor: Dr. Guangxing Zhang (JITRI) Co-supervisor: Dr. Dongyao Jia (XJTLU) Co-supervisor: Dr. Miguel López-Benítez (UoL)
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project
Project Title	A Generative Large Language Model for Encrypted Network Traffic Classification
Contact	Please email along.jin@xjtlu.edu.cn (XJTLU principal supervisor's email address) or (guangxing@ict.ac.cn) with a subject line of the PhD project title

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.

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) **Jiangsu Future Networks Innovation Institute**. The student will be registered as an XJTLU PhD student but is expected to carry out the major part of his or her research at the Institute in **Jiangsu Future Networks Innovation Institute**.

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 institute in Suzhou, the PhD candidate will be provided with a monthly living allowance at a standard ...5000 CNY... per month by ...Jiangsu Future Networks Innovation Institute.

Project Description:

Network traffic identification holds paramount importance, particularly in distinguishing various forms of encrypted traffic including protocols, applications, services, and malicious flows. Identifying encrypted traffic encompasses intricate levels from target flows to individual packets, hosts, and entire sessions. To address this complexity, modern approaches leverage deep learning methods which exhibit the capability to directly extract and recognize features from raw traffic data, offering high-precision end-to-end solutions. Nevertheless, deep learning models often confront challenges such as extensive parameter counts, prolonged inference times, and substantial resource consumption. To mitigate these challenges and harness the full potential of deep learning for network traffic identification, this study focuses on developing a large-scale network traffic model grounded in deep learning. The objective is to devise a model that can pre-train on vast amounts of unlabeled encrypted traffic data, leveraging self-supervised learning techniques. By adopting this approach, the model acquires a robust generalized understanding of network traffic patterns, enhancing its applicability to a wide range of downstream tasks. Furthermore, the study aims to fine-tune this pre-trained large language model using Prompt Learning for specific downstream scenarios, thereby reducing the training costs and increasing the model's generalization capabilities. This strategy ensures that the model maintains a high level of accuracy while being more deployable and adaptable to various network environments. In summary, the research endeavors to contribute a scalable and efficient deep learning-based network traffic identification model, leveraging the power of large pre-trained models to revolutionize the field of cybersecurity.

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>

Supervisor Profile:

Principal Supervisor:

<https://scholar.xjtlu.edu.cn/en/persons/AlongJin>

JITRI Co-supervisor:

https://www.ict.ac.cn/sourcedb/cn/jssrck/201310/t20131029_3964349.html

How to Apply:

Interested applicants are advised to email along.jin@xjtlu.edu.cn (XJTLU principal supervisor's email address) or guangxing@ict.ac.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 available