

## PhD studentship (Full-time)



Institution	Xi'an Jiaotong-Liverpool University, China
Department	Department of Electrical and Electronic Engineering
Supervisors	Principle supervisor: Dr. Kyeong Soo Kim (Xi'an Jiaotong-Liverpool University) Co-supervisor: Prof. Alan Marshall (University of Liverpool, UK);
Application Deadline	Open until the position is filled
Funding Availability	Funded PhD project (world-wide students)
Project Title	Energy-Efficient Time Synchronisation and Data Bundling Schemes for Wireless Sensor Networks (高效节能的无线传感器网络时间同步和数据捆绑方案)
Contact	Please email <a href="mailto:Kyeongsoo.Kim@xjtlu.edu.cn">Kyeongsoo.Kim@xjtlu.edu.cn</a> (principal supervisor's email address) and copy <a href="mailto:doctoralstudies@xjtlu.edu.cn">doctoralstudies@xjtlu.edu.cn</a> 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 Electrical Engineering or Computer Engineering. Evidence of good spoken and written English is essential. The candidate should have an IELTS score of 6.5 or above, or an equivalent qualification, 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 3500 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 three months, if this is required by the project.

### **Project Description:**

Wireless sensor networks (WSNs) have been the focus of extensive studies due to their versatility and broad range of applications. Time synchronisation is one of critical components in WSN operation, as it provides a common time frame among different nodes. As a sensor node is a low-complexity and battery-powered device, energy efficiency is the key in designing WSN schemes and protocols.

While many synchronisation schemes try to save the power of all WSN nodes, this project focuses on asymmetric WSNs — where a head node is equipped with a powerful processor, connected to both wired & wireless networks, and often supplied power from an outlet, and sensor nodes are battery-powered and connected only through wireless channels — and study how to minimise energy consumption in time synchronisation at sensor nodes by moving most of the processing to the head node.

Throughout the project, a doctoral student is to investigate energy-efficient WSN time synchronization and measurement data bundling schemes, and to evaluate the performance of the proposed schemes using computer simulations and a real testbed. The first task requires the capability of mathematical analysis based on probability/random processes and statistical signal processing as well as a good knowledge of networking protocols and systems. The second task, on the other hand, demands good programming skills (e.g., Python and C/C++) and an experience of working on single-board computers.

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

<http://www.xjtlu.edu.cn/en/admissions/phd/entry-requirements.html>

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

### **How to Apply:**

Interested applicants are advised to email [Kyeongsoo.Kim@xjtlu.edu.cn](mailto:Kyeongsoo.Kim@xjtlu.edu.cn) (principal supervisor's email address) the following documents and copy [doctoralstudies@xjtlu.edu.cn](mailto:doctoralstudies@xjtlu.edu.cn) (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 above 6.5 or equivalent is required)
- 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)

**Informal enquiries** may be addressed to Dr. Kyeong Soo Kim ([Kyeongsoo.Kim@xjtlu.edu.cn](mailto:Kyeongsoo.Kim@xjtlu.edu.cn)), whose personal profile is linked below,

- <http://www.xjtlu.edu.cn/en/departments/academic-departments/electrical-and-electronic-engineering/staff/kyeong-soo-joseph-kim> (@XJTLU)
- <http://kyeongsoo.github.io> (@GitHub)