

## PhD Studentship toward EU H2020 Research Project - 5G-ERA

A full time PhD studentship is available with a choice of three topics, including:

- Robotics and SLAM
- Cloud native software application development and system integration
- 5G Network Function Virtualisation

The topics will be integrated with current research over 5G NFV Technology, ROS development, ETSI OSM for managing and orchestration, OpenStack, Containerisation and Kubernetes.

### **Funding amount:**

The studentship will cover:

- £1,274 tax free bursary per month (£15,288 per annual)
- EU student fee for three years

**Closing Date:** 12<sup>th</sup> of Feb 2021

**Interview Date:** 19<sup>th</sup> of Feb 2021 (Interviews will be held on-line)

**Period:** The PhD programme is expected to be started from 15th of March 2021.

**Further information:** You may wish to discuss your application with Dr Renxi Qiu by email at Renxi.Qiu@beds.ac.uk, or by phone +44(0) 1582 743529. Part-time PhD may be considered on pro rata basis.

### **The Project:**

5G Enhanced Robot Autonomy is a £6 million H2020 ICT research project with 13 partners from 7 different countries to study 5G enhanced robot autonomy. It belongs to 5G-PPP Phase 3 (part 2) which targeting the utilisation of experiences gained from 5GPPP Phase 1, Phase 2 and Phase 3.1 into innovative vertical solutions. The project provides vertical customers with a user-centric paradigm of integrating vertical knowledge into the existing standardised 5G testing framework to improve Quality of Experience (QoE). The project's achievements will also have strong impacts to automated mobility, Industry 4.0 and healthcare as they all require autonomous robots. The project will demonstrate how the new NetApps are developed via the project's achievements to enable robot autonomy enhancement with four different use case scenarios in the field of surveillant robots for PPDR (automated mobility), semi-autonomous delivery robots for transport (automated mobility), logistic robots for hospital (healthcare) and remote assistance for manufacturing process (Industry 4.0). These case studies can also be regarded as showcases of the potential of 5G and 5G-ERA to the acceleration of the ongoing convergence of robotics, AI & cloud computing; and to unlock a next level of autonomy through 5G based dense learning in General. Dr Renxi Qiu is the scientific coordinator of the entire 5G-ERA project and also the PI in university of Bedfordshire.

### **The IRAC:**

The University of Bedfordshire (BED) is one of the modern universities in the UK. The Institute for Research in Applicable Computing (IRAC) will operate research and development proposed in this 5G-ERA project. IRAC has been active in research of robotics, AI, 5G, computer networking, healthcare data processing and visualisation, and IoT. Research in IRAC ranks 27 among 88 computer science departments in UK universities in REF2014. In recent years, IRAC led and participated in 19 EU

FP7/H2020 projects, 8 projects funded by national funding bodies including the EPSRC, and 7 regional and local projects. The Institute currently leads and participates in 6 EU H2020/Regional fund projects and 2 nationally funded projects. All these projects are in the areas of ICT-assisted healthcare, robotics and engineering. The Institute is the leader of WP2 “Intent-based networking for 5G autonomous robots” and WP4 “Technology integration of 5G-ERA middleware”. IRAC is specialised in robotics and semi-autonomous control; AI and machine learning; Cloud Computing & development of microservices applications; Applications of 5G and wireless networking. They are the main developer of 5G-ERA cloud native middleware.

### Person Specification

	Desired Criteria
<b>Qualifications</b>	<ul style="list-style-type: none"> <li>• BSc or MSc Degree in computer science and related field</li> <li>• Equivalent work experience can also be considered</li> </ul>
<b>Knowledge</b>	<p>At least one of the following topics:</p> <ul style="list-style-type: none"> <li>• Knowledge of Cloud Computing and Cloud Native development</li> <li>• Knowledge of Virtualisation, Management and Orchestration, in particular Network Function Virtualisation (NFV)</li> <li>• Knowledge of software development life cycle and open-source development</li> <li>• Knowledge of Machine Learning and Artificial Intelligence</li> </ul>
<b>Experience</b>	<p>At least one of the following topics:</p> <ul style="list-style-type: none"> <li>• ROS development</li> <li>• ETSI OSM for managing and orchestration</li> <li>• OpenStack and software-defined network</li> <li>• Containerisation and Kubernetes as well as deployment workflow (on-boarding)</li> </ul>
<b>Skills/abilities/competencies</b>	<ul style="list-style-type: none"> <li>• Be able to execute tasks according to plan, while keeping a thorough procedural record and data log</li> <li>• The ability to contribute to a team effort whilst being a self-starter, highly motivated and willing to take the project lead</li> <li>• Need a logical approach to a problem solving and methodical and inquisitive mind</li> <li>• Capable of clearly organising and presenting ideas and plan to management and peers</li> </ul>

<b>Personal Attributes</b>	<ul style="list-style-type: none"><li>• Well Organised</li><li>• Willingness to learn</li><li>• Ability to work in a culture of change and growth, being enthusiastic and adaptable regarding the work environment and expectation</li><li>• Ability to work independently and proactively, exercising personal initiative and responsibility and using own judgement to solve problems</li><li>• Flexible and effective team worker with the ability to demonstrate working to deadlines.</li></ul>
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