Research Software Engineer, STEM

Full Time
Fixed Term contract for 12 months
Grade 7
Walton Hall, Milton Keynes

The role

The position involves the development of software technology solutions and proof of concept prototypes that will support forensic readiness for drone-related investigations. The research will be carried out as part of the H2020-funded “Drone Identity” project, which is a 1-year programme of interdisciplinary research that will develop a monitoring system for Drone Identity that will enrich and deepen collaboration between drone pilots and the aviation regulators. This system will the exchange of data gathered using a variety of digital technologies, to support investigation of incidents and privacy violation cases.

The Project Drone Identity aims to reframe the challenges that record and analyse the incidents involving unmanned aerial vehicles (UAVs); where safety regulations and privacy protection requirements must be traded off against the energy consumption and other technical constraints of the UAVs, along with the LiveBox architecture of the U-space. The project aims to support the investigations of drone incidents and investigate technical means to identify potential or actual threats to security, safety, and privacy.

A key challenge of the project is to investigate how forensic-readiness requirements of digital incident investigations can be achieved through the software-augmented capability of drones. The architecture of live streaming flight data records need to be implemented through a prototype that can not only capture the data, but also analyse them for the purpose of identifying and verifying the incidents, and lower the risks imposed by the accidental or incidental uses of drones. As part of this we plan to explore ways of representing domain knowledge such as air safety regulations, no-fly zone constraints, and integrity requirements for particular investigations and privacy requirements, that will enable forensic-readiness of the system of systems.

This project focusses on the challenge of collection and analysis of flight data records in the context of use of UAVs. We will use these analysis results to create a socio-technical system for Drone Identity that supports efficient investigations of incidents, which could support regulators, pilots, vendors, moderated by privacy protection and forensic-soundness requirements.

The project brings together a multi-disciplinary research team, combining expertise in technology with an enhanced understanding of the air traffic services, the end-user of drones (pilots) and the regulated airspaces together, and the effect of this collaboration on drone forensics. Further co-creation and refinement of research challenges is embedded into the research through engagement with partners in the EngageKTN consortium in the SESAR joint undertaking.

The post may also involve contributing to and advising other research projects in the school in areas such as other healthcare applications, food security. If further funding is secured, the ultimate aim of this appointment is to help build a larger drone forensics research programme.
The post holder will also work closely with academics and may also work with post-doctoral researchers and PhD students advising on directions for software development and promote good research software engineering practice within the faculty.

**Main duties**

The person appointed to this post will undertake duties to include:

- To design and implement software that supports drone forensic investigations, integrating a variety of data sources that include drones, weather information, no fly zones, etc.
- To support the deployment of the technologies for the field trials.
- To support software development activity in related research projects.
- Contributing to the research culture and activities of the Software Engineering and Design (SEAD) Group and School of Computing and Communications.
- Joining a thriving inter-disciplinary research team at The Open University’s SEAD Group (http://sead.open.ac.uk), in collaboration with research colleagues in the NATS (http://nats.aero) and EnagageKTN (https://engagekttn.com/). There is a expectation that you will actively contribute to the strong profile of the group and its inter-disciplinary ethos through participation in the development and publication of research results.

All Staff are expected to:

1. Co-operate with the Open University in ensuring as far as is necessary, that Statutory Requirements, Codes of Practice, University Policies and Departmental Health and Safety arrangements are complied with.
2. Have a strong commitment to the principles and practice of equality and diversity.
3. Attend appropriate staff development events.
Person Specification

Essential

- Strong programming ability
- A qualification in computing or a related area or equivalent experience
- Experience of building embedded software systems
- Demonstrable knowledge of programming development tools (revision control, debuggers, profilers)
- Good communication, presentation and interpersonal skills.
- An understanding of equal opportunities and diversity in the work place.

Desirable

- Experience of building mission critical systems such as Robot Operating Systems
- Working knowledge of Linux or other Unix-like operating system
- Experience of programming applications for collecting IoT data platforms.
- Experience of working with time series data
- Experience of working in interdisciplinary teams,
- Experience of using Python, C/C++
- Experience of Android development
- Project management experience

Competencies

Ability to communicate with users – to understand their needs and concerns
Ability to find new or different ways of achieving results
Ability to cooperate with colleagues and to understand and value individual differences
Ability to prioritise and to take responsibility for delivering results
About the Unit

STEM

Faculty of Science, Technology, Engineering & Mathematics
The Faculty of Science, Technology, Engineering and Mathematics (STEM) is comprised of:

- School of Computing & Communications
- School of Environment, Earth & Ecosystem Sciences
- School of Engineering & Innovation
- School of Life, Health & Chemical Sciences
- School of Mathematics & Statistics
- School of Physical Sciences
- Knowledge Media Institute
- Deanery including teams supporting Curriculum; Research, Enterprise and Scholarship; Laboratory Infrastructure; and Faculty Administration

“We aspire to be world leaders in inclusive, innovative and high impact STEM teaching and research, equipping learners, employers and society with the capabilities to meet tomorrow’s challenges”

The Faculty of STEM consists of 2500 staff including 1,800 Associate Lecturers. The Faculty delivers over 185 modules across undergraduate and postgraduate curriculum, supporting nearly 19,000 students (full time equivalents) which is 29% of the OU total.

The Faculty generates more research income (circum £17M) than any other Faculty in the University, supported by a comprehensive laboratory infrastructure.

We are proud of our distinctive values and capabilities underpinning our aspiration:

We are inclusive:
- We transform people’s lives, ensuring STEM education is openly accessible to many thousands of students from diverse backgrounds – our students express high satisfaction with their study experience.
- We engage the public in exciting citizen science and engineering, including through free open educational resources, multi-platform broadcasting, outreach to inspire the next generation and with programmes to encourage more women into STEM.

We are highly innovative:
- We are at the forefront of innovative developments in teaching practical science and engineering at a distance, through simulated and remote access laboratories and practical experimentation.
- Our high quality teaching and curriculum are informed by world-leading research, strong links with professional bodies and communities of practitioners, as well as by scholarship focused on continuously improving our STEM pedagogy.

We deliver significant social and economic impact:
- We provide STEM higher education at a scale and reach unsurpassed in the UK, with a sizeable international reach and further growth potential.
• We inject transferable STEM skills and knowledge direct into the workplace for immediate employee and employer benefit, as students combine study while working.

• The employability value of our courses is underpinned by accreditation from leading STEM Professional Bodies and Learned Societies, as well as partnerships and sponsorship with leading employers.

• Our high quality, applied and academically relevant teaching and research addresses real-world issues, delivering impact for industry and society, including addressing pressing STEM skill-shortages across the UK.