

Research Associate in Security Engineering (Software Development)

Job Ref: REQ221045

As part of the University's ongoing commitment to redeployment, please note that this vacancy may be withdrawn at any stage of the recruitment process if a suitable redeployee is identified.

Project Description

There is an opportunity for a full-time Research Associate to join a highly motivated, interdisciplinary research team to develop innovative solutions in pro-active cyber defence and resilience. Project funding is from DSTL under the Autonomous Resilient Cyber Defence (ARCD) Intelligent Agents theme call. The project examines novel ways of diversifying the attack surface in modern cyber infrastructures utilising recent and emerging technologies in AI.

During the project you will liaise with a range of project collaborators, including the secure cyber systems research group at the University of Warwick and DSTL. The involvement of these collaborators will take project results to real impact on areas including, but not limited to, threat source characterisation, asset reaction modelling and moving target defence.

The project will build on the asymmetry between offensive and defensive operations, the complexity of threat sources in cyber-physical systems, and multistage segmental intrusions. Moving Target Defence (MTD) techniques have been recently proposed to reduce the limitations related to the stationarity of security controls and the cost of defence configuration. We propose a security risk-oriented asset re-parameterisation system that leverages machine intelligence to optimise MTD at runtime and address these limitations. The system utilises distributed intelligent agents to capture cyber observables and measure threat exposure and the efficacy of deployed controls coupled with Machine Learning techniques in the assets' re-parameterisation process.

The project will involve a mixture of research, design, security engineering, and software development. The technical work will need to be effectively discussed with and communicated to our University of Warwick partners.

Job Description

Job Grade: Specialist and Supporting Academic Grade 6

Job Purpose

To lead research related to security engineering and software development and produce a demonstrable Proof of Concept. The Research and Development (R&D) activities will be undertaken under a predefined set of milestones and deliverables as per contractual obligations.

Job Duties

- Undertake R&D activities that flexibly and autonomously apply their outcomes to fulfil the project scope.
- Communicate and provide information to the project leaders and other partners and stakeholders.
- Attend and prepare reports for regular meetings to report progress, exchange data/experience, publish results, and agree upon future work, including travel as necessary.

- Communicate results and maintain an effective scope of the project
- Support efforts to produce potential future funding proposals using the results of this project
- Be responsible for conducting the day to day running of the project.
- To formulate detailed plans for the project based on broad guidance from the project team.
- To feed back to the project team on progress, to make recommendations for next steps.
- To support the project team by enhancing relationships with existing collaborators and by assisting the establishment of relationships with new collaborators.
- To write research papers suitable for publication in high quality academic journals.
- To attend and contribute to conferences.
- To contribute to project promotion and public engagement events.
- To maintain confidentiality at all times and ensure that intellectual property (IPR) agreements are not violated.
- To assist the academic staff in the project team with the supervision of undergraduate MSc and PhD project work and day-to-day supervision and support of other researchers.
- Where appropriate, to deliver teaching, tutorial and laboratory sessions to students.
- Engage in training programmes in the University (or elsewhere) that are consistent with the needs and aspirations of the project and those of the Department.
- Undertake other duties as may be reasonably requested and that are commensurate with the nature and grade of the post.

Points To Note

The purpose of this job description is to indicate the general level of duties and responsibility of the post. The detailed duties may vary from time to time without changing the general character or level of responsibility entailed. Training will be provided as necessary and in support of the Researchers' professional development, and an attitude for learning will be an essential criterion in the selection of a successful candidate.

Special Conditions

All staff have a statutory responsibility to take reasonable care of themselves, others and the environment and to prevent harm by their acts or omissions. All staff are therefore required to adhere to the University's Health, Safety and Environmental Policy & Procedures.

All staff should hold a duty and commitment to observing the University's Equality & Diversity policy and procedures at all times. Duties must be carried out in accordance with relevant Equality & Diversity legislation and University policies/procedures.

Successful completion of probation will be dependent on attendance at the University's mandatory courses which include Respecting Diversity and, where appropriate, Recruitment and Selection.

Organisational Responsibility

Reports to Dr. Konstantinos Kyriakopoulos (Senior Lecturer)

Person Specification

Your application will be reviewed with respect to meeting the essential and desirable criteria listed below.

Applicants are strongly advised to explicitly state and evidence how they meet each of the essential (and desirable) criteria in their application, giving examples of recent experience. You may use the **STAR** approach: explain what the **Situation** was, which **Task** you had to do or were allocated, what **Action** you took, what you did and a justification, and what was the **Result**. It is highly recommended that the candidates express in their Cover Letter how they fit to the Job Purpose and Job Duties described above. Stages of assessment are as follows:

- 1 – Application
- 2 – Test/Presentation
- 3 – Interview

Essential Criteria

Area	Criteria	Stage
Experience	Experience in Software Development.	1,2
	Experience in simulated environments commonly used for security testing (e.g. in Docker, Mininet, Vagrant among others)	1,2,3
Skills and abilities	The ability to write programmes to implement algorithms for machine learning in network security.	2,3
	Demonstrated ability to work as part of a team and meet deadlines	3
	The ability to write project reports and make technical presentations to industrial and academic research groups	1,3
	The ability to code models of network-related cybersecurity systems.	2,3
	The ability to write up research for publication	1
Qualifications	An undergraduate degree in a related discipline together with evidence of post graduate studies at Masters or Doctoral level.	1
Other	Commitment to observing the University's Equal Opportunities policy at all times.	3

Conditions of Service

The position available is 20 hours per week and fixed term for until 31 July 2023. Salary will be on Specialist and Supporting Academic Research (SSA6) - up to £39,745 per annum depending on experience, at a starting salary to be confirmed on offer of appointment.

The appointment will be subject to the University's normal Terms and Conditions of Employment for Academic and Related staff/Operational and Administrative staff, details of which can be found [here](#).

The University is committed to enabling staff to maintain a healthy work-home balance and has a number of family-friendly policies which are available at [here](#).

We also offer an on-campus nursery with subsidised places, subsidised places at local holiday clubs and a childcare voucher scheme (further details are available at: <http://www.lboro.ac.uk/services/hr/a-z/childcare-information---page.html>)

In addition, the University is supportive, wherever possible, of flexible working arrangements.

We also strive to create a culture that supports equality and celebrates diversity throughout the campus. The University holds a Bronze Athena SWAN award which recognises the importance of support for women at all stages of their academic career. For further information on Athena SWAN see <http://www.lboro.ac.uk/services/hr/athena-swam/>

Application

The closing date for receipt of applications is 25 September 2022.

