AI-enabled Cyber Wargaming

Type of award PhD Research Studentship

Department Engineering Mathematics, Intelligent Systems Laboratory

Scholarship Details Minimum £18,800 p.a.

Duration 4 years

Eligibility Home (UK) and EU citizens who have confirmation of UK settlement or pre-settlement status under the EU Settlement Scheme.

Deadline 1 October 2021

PhD Topic Background/Description

Current security incident response systems are largely knowledge-based, and this project seeks to advance the state-of-the-art by using a combination of AI-based modelling and simulation to predict both novel attack behaviours and suitable countermeasures. Particularly with the advent of AI-driven attacks, new, complex, and adaptive patterns of malicious behaviour will require a rapid mitigative response, and automation is key in order to contain a threat before it spreads and causes significant disruption or damage.

The research conducted will produce tools and techniques that offer an organisation’s cyber security operations unique insight which will be used to both inform their security design, both in terms of static structure and capabilities deployed in the network (such as firewalls), as well as future dynamic capabilities (such as automated incident response systems). The capability would need to consider the risks imposed by certain threats, as well as the costs and risks associated with taking certain defensive actions in response. Initially, it would be used in an offline fashion, but later could be extended to act in real-time to dynamically counter threats, either autonomously or in a collaborative manner, by explaining actions and expected consequences to a human decision-maker.

The research will be supervised at the University of Bristol by Prof Trevor Martin (Intelligent Systems) and Dr Matthew Edwards (BCSG), and by Dr Alfie Beard from the Future Cyber Defence team in BT Applied Research (based near Ipswich). The successful candidate will be expected to spend some time working in close collaboration with the BT team.

Further Particulars

Candidate Requirements

Applicants must hold/achieve a minimum of a master’s degree in computer science or a relevant scientific, mathematical, or engineering subject. Applicants without a master’s qualification may be
considered on an exceptional basis, provided they hold a first-class undergraduate degree. Please note, acceptance will also depend on evidence of readiness to pursue a research degree.

Basic skills and knowledge required:

- **Essential:** Excellent analytical skills and experimental acumen
- **Desirable:** A strong interest in AI and cyber-security, a good programming background and a desire to enhance the security of the connected world.

**Scholarship Details**
This is a fully funded 4-year studentships covering:

- Minimum £18,800 tax-free stipend per year
- Tuition fees at UK student rates
- Equipment and travel allowance to support research related activities.

Open to Home (UK) and EU citizens who have confirmation of UK settlement or pre-settlement status under the EU Settlement Scheme. Applicants must have been ordinarily resident in the UK for at least 3 years prior to the start of the studentship (with some further constraint regarding residence for education).

For EPSRC funding, students must meet the [EPSRC residency requirements](#).

**Informal enquiries**
Please email Prof Trevor Martin ([Trevor.Martin@bristol.ac.uk](mailto:Trevor.Martin@bristol.ac.uk)) or Dr Matthew Edwards ([matthew.john.edwards@bristol.ac.uk](mailto:matthew.john.edwards@bristol.ac.uk))

For general enquiries, please email [sceem-pgr-admissions@bristol.ac.uk](mailto:sceem-pgr-admissions@bristol.ac.uk)

**Application Details**
Prior to any application, please contact Prof Trevor Martin to discuss your research proposal to see if it aligns with his current research. No indication of an offer can be made until a completed application has been received.

To apply for this studentship, submit a PhD application using our [online application system](http://www.bristol.ac.uk/pg-howtoapply)

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Engineering Mathematics Department” and specify the title of the scholarship in the “other” box below along with the name of the supervisor. Interested candidates should apply as soon as possible.

Deadline for applications: **31 July 2021.**

[Apply now](#)