Candidate Information

Position:	Research Fellow or experienced Research Assistant
School/Department:	Centre for Secure Information Technologies
Reference:	22/110559
Closing Date:	Monday 30 January 2023
Salary:	Research Assistant: £29,619 - £34,308 per annum. Research Fellow: £35,333 - £36,386 per annum
Anticipated Interview Date:	Tuesday 14 February 2023
Duration:	Available until 30 November 2023

JOB PURPOSE:

To investigate emerging research opportunities in the use of Digital Twin technologies to significantly improve cyber security provision by analysing the unique cyber and physical properties of Cyber Physical Systems (CPS).

To investigate novel methods for analysing CPS architectures to identify which subsystems are optimal to include in Digital Twin platforms to enable effective security provision, and to evaluate the proposed methods using case studies developed with external academic project partners.

MAIN ACTIVITIES/RESPONSIBILITIES:

1. Investigate Digital Twin models and technologies, and their potential application to cyber security solutions in cyber physical systems.
2. Design, develop and refine methods for formally analysing cyber physical systems, taking account of system architectures, sub-systems, components, control loops, embedded computing platforms, cyber trust boundaries, communication networks, threat models, etc. to define Digital Twin models capable of supporting cyber security monitoring of the CPS. This may involve the adaption or extension of established methods and frameworks, such as Data-Flow-Diagrams, OCTAVE, PASTA, etc.
3. Develop CPS use-cases to carry out analyses and critical evaluations of the proposed methods.
4. Produce high quality research outputs consistent with project aims and commensurate with career stage and experience (i.e. AC1 or AC2). This will include collaborating and co-authoring with PI and project team (as appropriate) on outputs.
5. In consultation with the project team, present research milestones and outputs at national and international conferences, and journals (commensurate with AC1/AC2 career stage and experience).
6. Assist grant holder in the preparation of funding proposals and applications to external bodies.
7. Carry out occasional educational supervision, demonstrating or lecturing duties within the post holder's area of expertise and under the direct guidance of a member of academic staff.
8. Undertake supplementary duties relevant to the success of the project including administrative duties and additional training and development activities as required.

ESSENTIAL CRITERIA:

Research Assistant:

1. 2:1 Honours degree in Computer Science, Electrical and Electronic Engineering, or a related discipline.

Research Fellow:

1. Have (or be about to obtain) a PhD in Computer Science, Electrical and Electronic Engineering, or a related discipline.
2. At least 3 years of research/work experience (including PhD research) in an area related to cyber-security, threat modelling, formal modelling, or systems engineering.
3. Strong publication record, commensurate with stage of career.

Both:

1. Relevant academic or industrial research experience in cyber-security, threat modelling, formal modelling, or systems engineering. This may be evidenced through industrial experience or academic projects that are clearly aligned with the job description.
2. Proven ability to contribute to broader management and administrative processes.
3. Contribute to the School's outreach programme by links with industry, community groups etc.
4. Sufficient breadth and depth of specialist knowledge in the discipline and of research methods and techniques to work within established research programmes.
5. Practical problem-solving skills, independence of thought and initiative.
6. Proven ability to communicate complex information effectively in oral and written format.
7. Demonstrable ability to assess and organise resources.
8. Strong team working skills.
9. Able to visit collaborative partners and to attend meetings and conferences nationally and internationally as requested.

DESIRABLE CRITERIA:

Research Assistant:
1. 1st Class Honours degree in Computer Science, Electrical and Electronic Engineering, or a related discipline.

Both:
1. Academic research experience in application of analysis methods such as STRIDE, OCTAVE, PASTA, HAZOP, MITRE ATT&CK, Cyber Kill Chain, etc.
2. Experience in successful research with external partners (e.g. joint research publications or deliverables).
3. Good software development skills.