

THE UNIVERSITY OF MANCHESTER
PARTICULARS OF APPOINTMENT
FACULTY OF SCIENCE & ENGINEERING
SCHOOL OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE
RESEARCH ASSOCIATE IN VERIFICATION FOR SENSOR SYSTEMS X 2 POSTS

VACANCY REF: SAE-017038

Salary:	£32,816 to £40,322 per annum depending on relevant experience
Hours:	1 FTE
Duration:	Fixed term from 1 September 2021 until 31 December 2022
Location:	Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:

Name: Prof. Clare Dixon

Email: clare.dixon@manchester.ac.uk

or

Name: Prof. Michael Fisher

Email: michael.fisher@manchester.ac.uk

BACKGROUND

Research Project: The researchers will work on the EPSRC-funded "Science of Sensor System Software" (S4) research programme, <http://www.dcs.gla.ac.uk/research/S4/> under the direction of Professor Clare Dixon and Professor Michael Fisher within the Department of Computer Science. The S4 programme aims to develop a unifying science of sensor systems in the presence of uncertainty ensuring that their systems and the information they provide is resilient, responsive, reliable, statistically sound and robust. The S4 programme involves close collaboration with academic and industrial partners, primarily from the University of Glasgow (focusing on Foundations), Imperial College London (Engineering), and the University of St. Andrews (Adaptation) with the Manchester team focusing on verification.

Overall Purpose of the Job:

The researcher will develop, extend, and apply formal verification and development techniques for sensor system software, carrying out research into formal methods (model-checking, proof, run-time verification, static analysis), and foundations of autonomous, sensor-based, or cyber-physical systems. Typical research tasks concern producing new research in formal verification or logical methods and may involve one or more of the following.

- Enhancing or extending formal verification systems to broaden applicability or improve efficiency.
- Developing abstractions of sensors, communications networks, control systems, etc, providing input for formal verification tools.
- Utilising existing verification tools for component logics in a modular way to construct verification systems for the combinations of the logical dimensions required for sensor network analysis.
- Exploring the potential for the definition, design, and deployment of runtime verification components for fault monitoring in practical sensor-based deployments.
- Applying verification and development techniques to case studies developed with project partners.

Key Responsibilities, Accountabilities or Duties:

The range of duties will include:

- Manage day-to-day running of the project under supervision of Prof. Dixon and Prof. Fisher.
- Work as part of a research team and contribute to the detailed planning of the research.
- Use initiative and creativity to identify areas, develop new methods and extend the research.
- Work with external academic collaborators, and with other stakeholders as necessary.
- Liaise with other research team members, related research projects, and the funders.
- Ensure adherence to planned activities and alert supervisors to any problems identified.
- Contribute to the dissemination of findings: including drafting of academic journal papers, preparation of reports to funder, feedback to key stakeholders.
- Undertake appropriate administrative tasks relating to the research project.
- Continually update knowledge and understanding in field or specialism.
- Deal with routine communication using a range of media.
- Build internal contacts and participate in internal networks for the exchange of information and form relationships for future collaboration.
- Join external networks to share information and identify potential sources of funds.
- Communicate material of a highly technical nature, orally, in writing and electronically.
- Maintain an up-to-date knowledge of and comply with Health and Safety, research governance and Data Protection legislation (including associated University policies)
- Prepare research ethics committee applications and data management plans, as appropriate.
- Maintain accurate and complete records.
- Attend and contribute to relevant meetings.
- Contribute to collaborative decision making with colleagues in areas of research.
- Be aware of the risks in the work environment and their potential impact on their own work and that of others.

The job description should be regarded as a guide of duties required and it is not intended to be definitive. It may be subject to variation from time-to-time, following consultation with supervisor.

PERSON SPECIFICATION

Essential:

- Have obtained a relevant PhD (or equivalent).
- Have achieved a strong publication record with high-quality publications in the following areas:

- Formal verification techniques, especially model-checking, theorem-proving or runtime verification
 - The application of formal verification tools and techniques to systems.
- Excellent communication and interpersonal skills.
- Excellent time management and organisational skills.
- Ability to work independently and as part of a team.
- Ability to liaise confidently and effectively with a range of individuals.
- Flexible approach to dealing with research problems as they arise.
- Willingness to learn and develop.
- Ability to present in both written and oral publications.
- Ability to meet deadlines.
- Ability to contribute to broader management and administrative processes.
- Understand equal opportunity issues as they may impact on areas of research content.

Desirable:

- Experience working for a research institution.
- Experience in working with formal methods and autonomous systems.
- Experience working with sensor networks.
- Experience working with industrial collaborators.
- Experience working on multi-site projects.
- High quality published research on sensor network development, logics, reasoning, or cyber-physical systems.
- Enthusiasm and pro-activeness.