

# JOB DESCRIPTION: Senior Research Software Engineer

**Ref: 0444-24**

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| **Job Title: MARS** Senior Research Software Engineer | **Grade: 8P** |
| **Department/College:** School of Mathematical Sciences, Lancaster University;   |
| **Directly Responsible To:** Professor Chris Jewell |
| **Supervisory Responsibility For:**  |
| **Other contacts****Internal:** Academic staff,Senior Research Associates/ Research Associates/PhD students involved with the School of Mathematical Sciences; Research Software and Infrastructure Engineers within the School of Mathematical Sciences and across campus; Lancaster Data Science Institute staff and members; Staff and Students at the University; Colleagues in host Department and Faculty.**External:** Members of the broader research team at partner universities, industrial partners and the wider research community.  |
| * **Major Activities:**

“MARS: Mathematics for AI in Real-world Systems” is an exciting new £15M investment at Lancaster University, expanding on our excellence in spatial epidemiological and environmental modelling.  Bringing in 10 new academic posts, with associated research staff and students, MARS will revolutionise Lancaster’s research capacity in mathematics connecting systems modeling and AI methods, to support its flagship strategies in the applied sciences of Manufacturing, Environmental Science, Health, and Cybersecurity.  This will be alongside new undergraduate and postgraduate programmes, providing student opportunities to address a major skills-gap in the principles underlying AI and their application to real-world systems.  These activities will allow us to reach out to industry and government partners as a regional, national, and global leader in next-generation mathematics.  With E3 funding, MARS will become a unique national capability in the North West, pushing the boundaries of AI-driven modelling to tackle key challenges in the modern world. The MARS Senior RSE will act as a research fellow, championing research software engineering for MARS. They will play a pivotal collaborative role in cutting-edge research projects across the School of Mathematical Sciences, and in delivering key software outputs from mathematics, statistics, and AI research projects. They will be expected to collaborate with research, academic, and IT professional staff to lead the creation of a strong RSE culture within the School, providing training and software engineering where required to enhance the School’s research profile. Within MARS, the MARS Senior RSE key responsibilities are:* Undertaking research, training and research software development necessary to achieve the goals of the MARS section.
* Lead the development and implementation of appropriate mechanisms for triaging research software development support: from ad-hoc queries in support of students coding needs (bug fixes, coding strategies and suitable packaging of code for journal publications etc.) to identifying and leading the full development of proof-of-concept work into full, open-source packages. Packages should be developed to a high standard and accompanied by appropriate levels of documentation (help files, vignettes etc.) to enable wide-spread adoption by the target user group.
* Lead the MARS’s activities in research dissemination via software, including leading and contributing to research software. This includes choice of appropriate dissemination platform (version control repositories, package/data repositories, cloud hosting, etc).
* Develop and deliver training in scientific programming using high-level interpreted languages (e.g. Python, R) as well as compiled languages (C/C++, Rust, Scala), introducing key DevOps skills e.g. version control, testing, scripting, code profiling, parallelisation and optimisation.
* Act as a champion and beacon for good applied mathematics and AI computing practice, to include the development and delivery of specialist programming training for students and staff (as appropriate), coordinating meetings/focus groups with MARS members and other end users to identify their needs; provide the MARS community with guidance on subject-specific software issues; identifying and promoting state-of-the-art computing and visualisation techniques relevant to MARS.
* To lead and contribute to other aspects of the research where appropriate. This may include identifying relevant literature from the computer sciences, engaging in the planning and development of new activities, and contributing to the broader knowledge transfer and impact agenda.
* To engage in personal development opportunities, and exploit opportunities to further develop the research work through funding.
* Participate in national and international conferences in AI computing, and lead in the organisation of workshops to present MARS results to a wider audience and keep abreast of current advances in the field.
* Act as a referee and contribute to peer assessment of research publications and grant proposals.
* Carry out other duties appropriate to the grade of the post as requested by the Head of MARS and Head of School.
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