THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF SCIENCE & ENGINEERING

SCHOOL OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

SENIOR RESEARCH SOFTWARE ENGINEER

VACANCY REF: SAE-030028

Salary:	Grade 7 £47,389 to £53,301 per annum, depending on relevant experience
Hours:	Full Time
Duration:	Fixed Term for 24 months
Location:	Oxford Road, Manchester

Enquiries about the vacancy, shortlisting and interviews:
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BACKGROUND

This role sits in the eScience Lab, the research group led by Professor Carole Goble and Dr Stian Soiland-Reyes at the department of Computer Science, University of Manchester in the UK. The Lab is focused on research and development of tools designed for data driven and computational research. The eScience Lab has a long history of working with research use cases and creating tools to support them. The main tools and platform the team are currently working on are systems for sharing experiments (FAIRDOM SEEK), a registry of scientific workflows (WorkflowHub), a way to package and describe Research Objects (RO-Crate), a training portal system (TeSS) and an online 'best practice guide' for data management, focused on the life sciences (RDMKit). The group is currently involved in over 20 funded projects, with funding from UKRI, Horizon Europe, Innovate UK and subcontracted research grants. While the group is focused on life science and health use cases, it works cross-domain in areas such as astronomy, social science and chemistry, as well as cross-cutting concerns such as reproducible research, provenance, community building, scholarly communication and software sustainability.

Advancing climate adaptation through open science and data integration in the European Open Science Cloud (EOSC) (ClimateAdapt4EOSC) is a Horizon Europe funded project that specifically empowers researchers across multiple disciplines to tackle climate change more effectively by

providing an advanced, EOSC-centred collaborative research environment. This environment integrates existing EOSC data and services while introducing new datasets and innovative features, such as FAIRification and Mapping and Entity Matching capabilities. The project will create a climate change adaptation ontology and an EOSC Climate-Adapt Knowledge Graph, enabling enhanced findability, accessibility, tracking, and life cycle management of diverse research outputs. By fostering interoperability and innovation, the project will significantly strengthen the capacity of European scientific communities to address climate change.

Manchester's role leverages their expertise in reproducibility, interoperability, provenance and their leadership in FAIR and reflects their involvement in various EOSC related projections and initiatives (e.g. the EOSC Opportunity Areas) to aid integration into the broader EOSC ecosystem.

The postholder will lead on strategy, research and development of FAIR, ontology driven approaches to climate data and their adoption, evaluation and communication within and beyond the boundaries of the project. This is a highly collaborative and consensus driven role and involves working with research software engineers, climate experts and technology experts in the Manchester team and partners across the project.

The postholder will be working closely with, and be line managed by the Manchester Principal Investigator Dr Stian Soiland-Reyes and be part of the eScience Lab team based in the Department of Computer Science.

Overall Purpose of the Job

This is not a lonely role but a highly team based, collaborative consensus driven where effective team working is just as important as making a strong personal contribution. The role holder will work with other research software engineers associated with the eScience Lab who have a climate background, they will work with project partners and their use cases and collaborate alongside lab experts and developers in FAIR and Research Objects. This co-working extends to colleagues at partner sites and collaborators in the UK, Europe and worldwide. Please keep this in mind when reading about the overall purpose of the role of the job and key responsibilities, accountabilities and duties.

The role entails leading the strategy, research, and development necessary to enhance the Findability, Accessibility, Interoperability, and Reusability (FAIRification) of climate data within the context of the European Open Science Cloud (EOSC).

The role holder will take a leading role in developing a privacy-preserving policy engine to track climate data use in ways that are agreed by the publishers of that data. They will enact the use and enhancement of RO-Crate mechanisms to FAIR data packaging and tracking of climate data. They will participate in creating an ontology based climate knowledge graph to enable indexing and integration of the FAIR-ified data and related resources.

The role holder will engage in Open Science activities and practices for data and software, build community consensus within the project and reach out to the wider EOSC task forces and thematic nodes to enhance co-ordination, knowledge and approach sharing.

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Key Responsibilities, Accountabilities or Duties

Leadership & strategy

You will lead efforts in building trust of derived climate data: This involves spearheading metadata generation and provenance tracking using standards such as W3C PROV, DCAT-AP, and schema.org. You would also explore methods with the broader team for users to contribute data usage records to enhance transparency.

You will take a leading role in the analysis of EOSC technical and semantic data interoperability frameworks: Your work will involve conducting systematic reviews of current EOSC services, frameworks, and data structures to identify existing interoperability challenges and necessary standardised approaches; this will involve work and guidance with existing experts in the team.

Research & Development

You will lead, develop and implement the privacy-preserving policy engine: You would contribute to the design and functionality of this internal service, ensuring it restricts and tracks CLIMATE-ADAPT4EOSC usage in conformance with agreed policies, licenses, and anonymisation requirements for sensitive data. This includes applying the Five Safes RO-Crate profile for tracking protected access to sensitive health data. Note although you will take a leading role this is a team based effort.

You will utilise Research Object Crate (RO-Crate) approaches for FAIR data packaging: You will be instrumental in packaging enriched climate data and ensuring it builds upon specifications like EarthCube Geocodes, Science on Schema, and RELIANCE Earth Observation Data Cubes to create a flexible EOSC Climate Metadata profile. This will involve working with partners and team experts to help validate any approach that is proposed - this will be an iterative process.

You will contribute to the FAIRification and trackability of climate data: This includes involvement in the generation of Research Object Identification (ROI), the creation of the climate change adaptation ontology, and the development of the Ontology-Based EOSC Climate-Adapt Knowledge Graph for indexing and integration, supporting data findability, accessibility, interoperability, and reusability. Again this is a team based effort and will involve working with the broader team to help meet these goals.

You will provide the FAIRification template for the Climate Data Adaptation Toolkit: As Manchester brings this expertise, you would contribute to ensuring the toolkit applies this template for structured representation of metadata, supporting technical interoperability across various file and data formats (e.g., CSV, GeoTIFF, GRIB, NetCDF, SHP). The template and its application will be a team based effort.

You will contribute to the Climate Data Refinery using common models: Building on experiences with cross-domain integration and mapping recommendations, you would help transform multidimensional data to common models and publish derived data products as FAIR Digital Objects in EOSC registries - this will involve working with the broader team and project partners; in some cases this will require you to be a consultant guiding the work of others and in some cases this will require you to gain input from other experts to make sure any approach here is fit for purpose.

Outreach, community & standards

You will engage in Open Science Activities: Collaborate with NCSRD and other partners to ensure along with the Manchester team and partners that the project adheres to Open Science practices, including green and gold Open Access for publications, FAIR principles for research output and data management, and publishing software under an OSI-compatible licence following FAIR4RS principles.

You will contribute to community consensus building: working closely with team members, projects members and the CLIMATE-ADAPT4EOSC Stakeholders Forum and other initiatives to ensure the appropriate uptake of solutions, including metadata standards, vocabularies, and interoperability frameworks, within EOSC task forces and thematic nodes.

Active overall project view

You will support adaptation and updating of technical developments: actively engaging in Task 5.5, which involves taking feedback and experiences from the project's demonstration rounds (Demo 2 and Demo 3) to revise and improve the technical solutions developed in WP2, WP3, and WP4; this will be a team effort involving Manchester team members and project partners - so this is broad area of concern and participation rather than sole responsibility.

Notes

You will make substantial contributions to the work packages, tasks, milestones and project deliverables led or involving Manchester and align with other relevant work packages, tasks and initiatives in the project. While a strong personal contribution is expected this is very much a team science role involving collaboration and consensus building

All work will align with the FAIR principles and EOSC policies and guidelines where practically possible.

The job description represents a guide of duties required and is not intended to be definitive. It may be subject to variation from time to time, and may require more emphasis on some aspects than others in practice. We take a collaborative approach to changes around duties.

PERSON SPECIFICATION

Essential:

- Software development leadership roles on a variety of systems/projects.
- Excellent software development skills in one or more of Python, Ruby or Java
- Excellent knowledge and experience in web development technologies
- Some understanding of semantic web technologies
- Experienced the entire software development life cycle stages (requirements,
- prioritisation, specification, design, code, and test) on multiple projects;
- Worked as part of a team of engineers (three or more concurrently) working on a codebase. This includes supporting code contributions, writing and assigning issues and reviewing pull-requests.
- Skills in Linux system administration

- Expert use of software development best practice (e.g., version control, testing,
- continuous integration, documentation, release management);
- Worked on multiple projects simultaneously balancing competing demands and
- deadlines;
- Technical Project Management; including people management/supervision and Mentorship;
- Excellent communication and interpersonal skills; including the ability to explain complex ideas and analyses to non-technical audiences
- Ability to work independently and as part of a multidisciplinary and multi-site teams
- Excellent time management and organisation skills, with the ability to prioritise workload and manage time to meet deadlines and objectives
- Experience of presenting both written publications and oral presentations
- Willingness to learn and develop;
- Ability to work to and meet deadlines;
- Willing to do work travel (10-15% of working time)
- Understanding of diversity issues in teams;
- BSc (2.i or higher grade or a higher degree) in computer science or a course with a significant computing aspect, or equivalent (e.g. on the job) experience.

Desirable:

- Worked on distributed multi-partner, multi-organisation projects; regularly interacting
- and co-producing with a range of individuals who hold different roles and skills.
- An understanding of climate data
- Broad knowledge of modern research methods used in climate science
- Consulting on software development focused technical assignments to external organisations.
- EU project experience
- An understanding of FAIR issues related to data, software, training or workflows.
- Product ownership experience
- Experience of contributing to successful research funding applications
- Experience of workflow management systems, particularly with regards to a deep
- understanding of their formats and execution lifecycles.
- Deployment systems (such as Docker or Conda)
- Standards development or experience with implementing standards
- Confidential data knowledge/experience
- A PhD with a significant computing aspect, or equivalent (e.g. on the job) experience.