



**UNIVERSITY OF LINCOLN
JOB DESCRIPTION**

JOB TITLE	CDT Research Software Engineer				
DEPARTMENT	Lincoln Institute for Agri-food Technology				
LOCATION	Riseholme Campus				
JOB NUMBER	CHS148	GRADE	7	DATE	June 2024
REPORTS TO	CDT Director				

CONTEXT

The University of Lincoln has been awarded a prestigious £10.9m UKRI AI Centre for Doctoral Training (CDT) in Sustainable Understandable agri-food Systems Transformed by Artificial Intelligence (SUSTAIN). The Lincoln Institute for Agri-Food Technology (LIAT) leads this collaboration with the University of Aberdeen, Queen's University Belfast, and University of Strathclyde, to train 60 PhD students over an eight-year period (five annual intakes of 12 students, 3 per university). Each PhD project will be linked to industry stakeholders, who will help the student and academic supervisory team co-create an innovative and practical solution to relevant, real-world problems in the sustainable agriculture domain.

SUSTAIN provides a cross-disciplinary, multi-institution doctoral training program to support innovative research in the application of Artificial Intelligence (AI) to sustainable agri-food. It covers technical and social science aspects of AI, alongside training in plant, animal and/or biosciences, tailored to individual students' needs and interests and aligned with an identified industry challenge. An ongoing, integrated research training programme is designed for students to undertake along their PhD journey, including participation in bespoke training workshops, CDT events (e.g. conferences and summer/winter schools), and taught modules offered at any of the four partner universities.

The CDT Research Software Engineer will join the CDT project team based in LIAT, on the University of Lincoln's Riseholme campus, to support the delivery of the SUSTAIN Centre for Doctoral Training. Reporting to the SUSTAIN Director, the role will support technical research software engineering aspects of the students' experience and research projects. This will include contributing to research software design, ensuring that students are comfortable with their computing environment, that they have access to appropriate facilities (including high-performance computing facilities available at each university as well as national UKRI facilities) and that they are informed about the basic principles and practice of software engineering, which may include conducting research with students and their supervisory team to identify and evaluate appropriate solutions.

To fulfil this role, you will need to be a confident and adaptable communicator (both in person and in writing) with clear understanding of research software engineering tools and principles, fundamental aspects of Dev Ops and high-performance computing.

This is a part-time (50% FTE) role and can be combined with other roles within the university (e.g. half-time PDRA role on a research project).

JOB PURPOSE

The SUSTAIN Research Software Engineer will collaborate with the SUSTAIN investigators and PhD project supervisory teams to support PhD students in the design, development and maintenance of high-quality research software. This role is focused on facilitating and supporting research software development in the context of a wide range of interdisciplinary PhD projects spanning topics related to the use of Artificial Intelligence (AI) for sustainable agriculture. This will include: conducting research into software engineering practice for AI; advising on choice of software tools, hardware and use of high-performance computing facilities; and sometimes providing DevOps support for students as needed. The post holder will pursue publishable research related to software development and the advancement and evaluation of appropriate computing tools and technologies that underpin sustainable AI research.

Applicants should hold a PhD in a relevant subject area and must be able to demonstrate an excellent track record in research software engineering and the development of projects in the AI domain. Experience working in a research environment is required. Well-organised and open-minded software engineers keen to contribute to good research software development practices and training of the next generation of AI researchers are strongly encouraged to apply.

Expertise at least in some of the following areas is beneficial to excel in the role:

- Containerisation (e.g. Docker)
- Software management and development tools and toolchains (e.g. git, GitHub, bloom, etc.)
- High-performance computing cluster tools
- AI software tools (e.g. scikit-learn, opencv, tensorflow, etc.)
- Unix-based operating systems (i.e. common flavours of Linux including Ubuntu)
- Programming languages typically used for AI software (python, C/C++, Java)
- Software documentation tools

KEY RESPONSIBILITIES

Software Development and Data Management

- Collaborate with CDT students and supervisory teams to identify and capture user requirements, validation and acceptance criteria for students' PhD project software systems
- Collaborate with CDT students and supervisory teams to design and implement techniques for the deployment and monitoring of students PhD project software systems.
- Ensure and facilitate access to appropriate hardware facilities and research software tools to support students' PhD projects
- Communicate appropriate research software engineering practices, including documentation, testing, issue tracking and version control
- Communicate appropriate research data management practices, including security, privacy, redundancy and sharing agreements (e.g. with project partners and stakeholders)
- Where appropriate, publish results of research software engineering and data management approaches in scientific venues

Project Management

- Participate in project management activities, including planning, scheduling, evaluating, reporting on progress and delivering training in research software engineering for the SUSTAIN CDT

Liaison and Networking

- Cooperate with the research community in LIAT, the Lincoln Centre for Autonomous Systems and the CDT partner universities to agree best practices and help PhD students to build reliable, usable and maintainable research software
- Liaise with the University of Lincoln's Digital Technologies (DT) department and appropriate/relevant external entities such as UK technology facilities (e.g. Archer) and/or commercial cloud providers (e.g. Amazon Web Services) to effectively allocate resources and develop solutions
- Identify and liaise with internal and external collaborators (universities and industries), and with colleagues in LIAT, maintaining positive and effective working relationships
- Promote the activities of the SUSTAIN CDT project team where appropriate, including publishing code, contributing to research articles and giving presentations in cooperation with project investigators, PhD students and supervisors

Internal Research Activities

- Participate in internal research activities related to the SUSTAIN CDT, including seminars, research meetings and conferences, in particular to contribute to training of researchers on all aspects of research software engineering. This may include involvement in related research projects.

Continuous Professional Development

- Undertake continuous professional development activities, especially where helpful or necessary to complete other duties as described above.

In addition to the above, undertake such duties as may reasonably be requested and that are commensurate with the nature and grade of the post.

ADDITIONAL INFORMATION

Scope and dimensions of the role

Applicants should have significant experience in research software engineering and will usually possess a PhD in a relevant subject area. They must have excellent programming skills and a deep understanding of collaborative research software development environments and relevant areas of DevOps.

Key working relationships/networks

Internal	External
<ul style="list-style-type: none">- CDT Director and Deputy Directors- CDT Project Manager- Lead Academics and Supervisors- Director of LIAT- College of Health and Science Research Office- Central Marketing Department- Central Finance and HR Departments- Other core University departments as required	<ul style="list-style-type: none">- External funding body- External academic partners- External CDT administrators in partner institutions- External industrial partners- External speakers- Event facilitators- Alan Turing Institute- Industrial liaison/business



**UNIVERSITY OF LINCOLN
PERSON SPECIFICATION**

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LINCOLN

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Selection Criteria	Essential (E) or Desirable (D)	Where Evidenced Application (A) Interview (I) Presentation (P) References (R)
Qualifications:		
PhD or equivalent	E	A
Extensive knowledge specific to research projects related to the use of AI in applied contexts	E	A/I
Experience:		
Extensive experience as a researcher and/or research software engineer	E	A/I
Authorship of research outputs of national/international standing		-
Measurement and monitoring of software quality and reliability	D	A/I
Architectural design of large-scale and/or complex software systems	D	A/I
Track-record in defining research software development guidelines and processes, including for testing, documentation and distribution	D	A/I
Maintaining and developing Linux-based systems and distributions	E	A/I
Knowledge of and commitment to software development best practice including issue tracking, testing, documentation, version control, build automation and continuous integration	D	A/I
Skills and Knowledge:		
Ability to design, conduct and project manage original research in software engineering	E	A/I
Excellent written communication, including the ability to write reports and research outputs	E	A/I
Advanced skills in programming languages in use for AI research computing, i.e. C/C++, Python, Java	E	-
Containerisation (docker)	D	A/I
Ability to prioritise own workload and work to specified deadlines under pressure	E	A/I
Ability to communicate complex subjects orally	E	A/I
Ability to make and explain significant technical decisions regarding software design and implementation	D	A/I
Project management, time tracking and task prioritisation skills	D	A/I
Competencies and Personal Attributes:		
Enthusiastic and flexible approach to work	E	I
Effective team member	E	A/I
Self-motivated, self-organised and able to work independently	E	A/I
Enthusiasm and commitment to represent the CDT and	E	A/I

promote also externally		
Professional courteous manner	E	I
Proactive, results-orientated and able to take initiative	E	A/I
Serious commitment to research software quality and a strong attention to detail	E	A/I
Business Requirements:		
Flexible hours to accommodate occasional evening and weekend work	E	A/I
Ability to travel within the UK on occasion	E	I

Essential Requirements are those, without which, a candidate would not be able to do the job. **Desirable Requirements** are those which would be useful for the post holder to possess and will be considered when more than one applicant meets the essential requirements.

Author	ES	PBP	AH
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