



Research
England



UNIVERSITY OF
LINCOLN

**UNIVERSITY OF LINCOLN
JOB DESCRIPTION**

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|-------------------|---|--------------|---|-------------|--------------|
| JOB TITLE | Senior Research Software and Database Developer | | | | |
| DEPARTMENT | Lincoln Institute for Rural and Coastal Health | | | | |
| LOCATION | Lincoln Campuses | | | | |
| JOB NUMBER | CHS160 | GRADE | 8 | DATE | October 2024 |
| REPORTS TO | Senior Development Manager | | | | |

CONTEXT

The Lincoln Institute for Rural and Coastal Health (LIRCH) is the country's first integrated and multidisciplinary research institute dedicated to rural and coastal health research. LIRCH has been awarded £10.9 million funding from Research England's Expanding Excellence in England (E3) fund and is in the process of significant expansion. As part of this expansion, the University will recruit to over twenty research positions. A technical and professional services team will also be embedded within the Institute to support the research and develop a financially sustainable research Institute.

With this expanded capacity, the Institute will bring together multiple disciplines to produce impactful research helping to tackle the place-based inequalities experienced by rural, coastal, and remote communities. By co-designing and shaping the emerging discipline together with the next generation of researchers and affected communities, LIRCH aims to create the future academic and community leaders of rural and coastal health.

The postholder will lead the LIRCH technical team following standard University guidelines and procedures as well as funder regulations. The postholder will work to enable the LIRCH academic and research team to source, generate, and interpret complex, place-based data sets to drive forwards the Institute's research agenda routed in rural and coastal health.

JOB PURPOSE

The University of Lincoln is significantly expanding its research in the growing specialism of rural and coastal health. There is a growing need for professional expertise in software and database development to guide and lead academic researchers within the specialism.

The Senior Research Software and Database Developer is a professional, non-academic position responsible for software development and management, database design and management, collaboration and stakeholder management, and project and resource management. They will collaborate with world-leading researchers in the Lincoln Institute of Rural and Coastal Health (LIRCH). They will design, develop, and maintain high-quality code, ultimately enabling novel research to be carried out more efficiently and reliably.

The postholder will liaise closely with researchers to understand their requirements and to implement excellent solutions. The role involves leading the development of new or existing software in the areas of rural and coastal health, the management of new software projects, the management of relevant databases and managing the outputs of less experienced developers.

As such, the role presents an opportunity to actively participate in research, applying innovative theories the health outcomes of rural, coastal, and remote populations.

Expertise in the some of the following areas are beneficial to excel in the role:

- Continuous Integration
- Collaborative Software Development
- Systematic Code Reviews
- Agile Software Engineering Processes
- Cloud Computing (PAAS, SAA etc.)
- Geospatial data
- Supporting research environments
- Distributed Processing, GPU computing, and High-Performance Computing clusters

The postholder will regularly advise on and independently supervise the software development work of technical line reports, early career researchers and postgraduate students, and take a leading role in software quality assurance, such as code review and approval.

KEY RESPONSIBILITIES

Technical Proficiencies

- Programming and Scripting Languages including proficiency in Python, R, Java, C++, or other relevant programming languages used in research software development.
- Experience with scripting languages (e.g., Bash, PowerShell) for automation.
- Experience with HTML code, Java/Javascript.
- Database Management including strong knowledge of relational databases (e.g., PostgreSQL, MySQL) and NoSQL databases (e.g., MongoDB, Cassandra).
- Experience with data warehousing solutions (e.g., Amazon Redshift, Google BigQuery) and distributed databases.
- Software Engineering Practice including expertise in software design patterns, object-oriented programming, and functional programming.
- Experience with version control systems (e.g., Git).
- Data Management and Processing including experience with big data technologies and cloud platforms (e.g., AWS, Azure, Google Cloud).
- Proficiency in ETL (Extract, Transform, Load) processes and data integration techniques.
- Knowledge of security and compliance requirements, such as data governance frameworks, encryption, and best practices for securing sensitive research data.
- Understanding and ability to advise on relevant data privacy regulations and compliance requirements.

Software Engineering and Database Management

- Identify and capture user requirements and acceptance criteria and deliver solutions to ensure they are met.
- Design, develop, and maintain research software applications, tools, and platforms that support data analysis, modelling, simulation, and visualisation.
- Design and implement techniques for the deployment and monitoring of software systems including on the cloud and local resources.
- Ensure that research software is developed according to best practices in software engineering, including code versioning, documentation, testing, and deployment.
- Employ standard approaches to distributed and/or high-performance computing to novel domains and disciplines.
- Ensure and facilitate long-term software maintenance.
- Lead initiatives in software quality assurance, including code reviews and approval processes.

- Implement and manage Continuous Integration/Continuous Deployment (CI/CD) pipelines for research software projects.
- Define and communicate appropriate software engineering practices, including documentation, testing, issue tracking and version control.
- Lead the design, implementation, and optimisation of relational and non-relational databases to support research data storage and retrieval needs.
- Ensure data integrity, security, and compliance with relevant regulations, including GDPR, HIPAA, or other research-specific guidelines.
- Oversee the management of large-scale datasets.
- Co-design and develop a project dashboard to facilitate effective project management and outputs reporting.

Project and Resource Management

- Perform project management activities, planning, scheduling, monitoring and reporting on progress of software development aspects of research projects.
- Manage the lifecycle of research software and database projects, including planning, budgeting, risk management, prioritisation, resource allocation, and timelines.
- Oversee procurement and management of software licenses, cloud resources, and data storage infrastructure.
- Lead, as appropriate, software development projects and direct junior developers towards effective and efficient solution development.
- Ensure that all research software and data management processes are aligned with the institution's policies and research goals.

Liaison and Stakeholder Management

- Work closely with researchers, data scientists, and domain experts to understand their software and data requirements and translate these into technical solutions.
- Co-operate with the research community at the Lincoln Institute for Rural and Coastal Health and related research units to build reliable, usable and maintainable research software and databases.
- Identify opportunities to contribute to research projects from inception to completion.
- Serve as the technical lead in cross disciplinary and cross-functional research projects, providing guidance on software and database best practices.
- Liaise with the university's Digital Technologies department to effectively allocate resources and develop solutions.
- Initiate, develop relationships and liaise with internal and external collaborators, maintaining positive and effective working networks.

- Communicate technical concepts and solutions to non-technical stakeholders and contribute to grant writing and research proposals.
- Promote the activities of the LIRCH team where appropriate, including publishing code, contributing to research articles and giving presentations in cooperation with researchers.

Internal Research Activities

- Participate in and help to organise internal research activities, including seminars, research meetings and conferences, in particular to contribute to training of researchers on aspects of software engineering and database management.
- Manage and mentor junior technical staff.

Continuous Professional Development

- Undertake continuous professional development activities.

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 software engineering and will usually possess a post-graduate qualification in a relevant subject area. They must have excellent programming skills and a deep understanding of collaborative software development environments.

Key working relationships/networks

| Internal | External |
|---|---|
| <ul style="list-style-type: none"> • LIRCH Director • LIRCH academic staff and researchers • LIRCH Professional Services and Technical teams • LIRCH Senior Development Manager • Postgraduate students • Digital Technologies representatives • Other research, technical and academic staff • College Executive | <ul style="list-style-type: none"> • Research collaborators and partners • Computing suppliers (e.g. high-performance computing, licenced software) • Sponsors and clients • UK Research Funding bodies • Other HEIs • Relevant Charities • Knowledge Exchange Networks • Regional and National partners in the Health and Care sector • Community representatives and groups • Government and local authority bodies |



**UNIVERSITY OF LINCOLN
PERSON SPECIFICATION**

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|------------------|---|-------------------|--------|
| JOB TITLE | Senior Research Software and Database Developer | JOB NUMBER | CHS160 |
|------------------|---|-------------------|--------|

| Selection Criteria | Essential (E) or Desirable (D) | Where Evidenced Application (A) Interview (I) Presentation (P) References (R) |
|--|---------------------------------------|--|
| Qualifications: | | |
| Postgraduate qualification or equivalent professional experience, i.e. significant support of research and/or software support in an academic or industrial setting | E | A |
| Extensive knowledge specific to software development in a research and/or industry setting | E | A/I |
| Experience: | | |
| Experience as a research software engineer and/or software engineer | E | A/I |
| Measurement and monitoring of software quality and reliability | E | A/I |
| Architectural design of large-scale and/or complex software systems | E | A/I |
| Track-record in defining software development guidelines and processes | E | A/I |
| Maintaining and developing Linux-based systems and distributions | E | A/I |
| Contributing to the preparation of grant proposals and/or scientific publications | D | A/I |
| Training related to software engineering | D | A/I |
| Mentoring/leading of junior developers and/or researchers engaged in software development | D | A/I |
| Developing systems using high-performance computing facilities, in the cloud and/or locally managed | E | A/I |
| Skills and Knowledge: | | |
| Advanced skills in at least two programming languages commonly used for research computing e.g. C/C++, Python, R, Java | E | A/I |
| Knowledge of and commitment to software development best practice including issue tracking, testing, documentation, version control, build automation and continuous integration | E | A/I |
| Advanced knowledge of numerical methods, data structures and algorithms | D | A/I |
| Understanding of relevant cloud computing, virtualisation and container technologies | D | A/I |
| Expertise in several specialist areas of technical computing, e.g. AWS, OpenStack, Scality, Azure, Google Cloud | D | A/I |
| Ability to create data visualisations | E | A/I |

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| Knowledge of technologies and their respective strengths and weaknesses for the development of web, mobile and data handling applications | D | A/I |
| Ability to prioritise own workload and work to specified deadlines under pressure | E | A/I |
| Ability to communicate complex subjects orally and in writing | E | A/I |
| Ability to make and explain significant technical decisions regarding software design and implementation | E | A/I |
| Software project management, time tracking and task prioritisation skills | E | A/I |
| Experience managing junior staff | D | A/I |
| Competencies and Personal Attributes: | | |
| Flexible approach to workload | E | I |
| Ability to work on own and as part of a team | E | I |
| Enthusiasm and commitment to represent the research centres and promote them also externally | E | I |
| Serious commitment to software quality and a strong attention to detail | E | I |
| Business Requirements: | | |
| Travel between campuses as required | 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.

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| Author | LS | PBP | AH |
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