Health Data Research UK

Applicant Pack

Job description and person specification

Post:	Senior Full Stack Software Engineer & Digital Architect
Location:	Flexible. Primary base could be anywhere in the UK, but must be willing and able to travel to London and elsewhere (mainly UK) in connection with the role
Salary:	£70000-£80000
Duration:	Permanent, Full Time or Part Time.
Reporting to:	Technical Programme Director

About Health Data Research UK

Health Data Research UK (HDR UK) is accelerating trustworthy use of health data to enable discoveries that improve people's lives.

We are the national institute for health data science. Our vision is for large-scale data to benefit every interaction with patients, every clinical trial and every biomedical discovery, and to transform public health.

The UK is in a unique position to realise the potential of health data, thanks to the NHS and its cradle-to-grave records for a population of over 65 million people.

Safe and secure use of this data could improve treatments, deliver better health care and save lives. It could help tackle some of the biggest health challenges worldwide, including cancer, diabetes and cardiovascular disease.

However, access to this data for researchers is often a lengthy, fragmented process, meaning the potential for improving healthcare is far from being realised in full.

We work in partnership with the NHS, industry, charities and universities to realise the potential of the UK's health data in life-changing research. Patients and the public are actively involved in shaping HDR UK's work and ensuring it delivers public benefit.

The Institute played a major role in the COVID-19 pandemic, working with the NHS and collaborators internationally to link and coordinate the use of large-scale data. With these resources, scientists and doctors could understand more about this new disease, identify which drugs were effective and provide evidence to allow the NHS and policymakers to respond to the challenge.

Our successes include:

- A Trusted Research Environments (TRE) for England was created early in the pandemic with health data covering >54 million people, thanks to a collaboration between NHS Digital and HDR UK through its British Heart Foundation (BHF) Data Science Centre. TREs are highly secure computing environments that provide remote access to health data.
- During the roll out of the Pfizer-BioNTech and Oxford-AstraZeneca vaccines against Covid-19, it was vital to understand how they performed in the population. A team supported by HDR UK through the BREATHE Health Data Research Hub were able to rapidly show the high protection offered by the vaccines after a single dose, thanks to assembling linked health data for 99% of the Scottish population.
- Nearly half a million people missed out on starting medication to lower their blood pressure during the Covid-19 pandemic, according to research enabled by the BHF Data Science Centre at HDR UK. The research included 1.32 billion records of medications dispensed to 15.8 million people in England, Scotland and Wales between 1 April 2018 and 31 July 2021.
- The Green Algorithms initiative promotes more environmentally sustainable computational science and is run by Loïc Lannelongue and Michael Inouye at HDR UK Cambridge. They have built tools for carbon footprint estimation, raised awareness about the environmental impacts of algorithms and driven change in the computational science community.
- A significant landmark early in 2024 saw the first research study of health records for 67 million people in all four UK nations. It looked at gaps in Covid-19 vaccine coverage and found that between a third and a half of the populations of the four UK nations had not had the recommended number of vaccinations and boosters by summer 2022. The approach could be extended to many other areas of medicine with great potential for new discoveries in the understanding and treatment of disease.

HDR UK is a virtual institute, with staff and partners in all four nations of the UK and an office in central London. We are an independent, registered charity with five years of core funding from nine of the UK's leading medical research funders, including UK Research and Innovation, the Department of Health and Social Care in England and equivalents in Northern Ireland, Wales and Scotland, and leading medical research charities.

At Health Data Research UK, we employ talented individuals who bring their own unique skills and experience to support the Institute's vision and benefit the whole team. Our values of transparency, optimism, respect, courage and humility guide how we work together within HDR UK, with our partners and other stakeholders.

HDR UK's strategy

Our five-year objectives are to:

1. Accelerate trustworthy data use by sorting the data

- Make it easier and quicker for researchers to find, access and use high-quality, large-scale data
- Fix the technical challenges needed for swift, safe and secure data use, by assembling innovative infrastructure solutions
- Increase health research efficiency and productivity by accelerating adoption of the FAIR (Findable, Accessible, Interoperable and Reuseable) data principles

2. Improve people's lives by unlocking the power of data

- Deliver cutting-edge research that harnesses large-scale data to change health policy and practice
- Exemplify trustworthy data use to deliver research that was previously impossible
- Test and improve the infrastructure so it serves all researchers

3. Shape the future of health data research

- Connect data, people and organisations to bring about cultural change and realise the UK's potential to be at the forefront of health data innovation
- Develop people and teams with diverse perspectives and skills needed to deliver health data research
- Embed good practice in patient and public engagement and involvement to build confidence in health data research for public benefit by increasing transparency and trustworthiness.

Purpose of the post

HDR UK requires the services of an experienced Senior Full Stack Software Engineer & Digital Architect to develop the next phase of our technical solutions including the Health Data Research Gateway (www.healthdatagateway.org), Safe People Registry (https://safepeopleregistry.org/), Cohort Discovery Service (https://healthdatagateway.org/en/about/cohort-discovery) and future technology services. This includes how our services, standards and associated open APIs work with the wider Technology Ecosystem across a range of academic, clinical, and industry groups.

The successful candidate will be part of a multidisciplinary team that develops an over-arching interoperable infrastructure to ensure that UK health data assets are Findable, Accessible, Interoperable and Reuseable (FAIR) and accessible for research, innovation and clinical trials. The chosen applicant will be expected to work within an Agile software development team, providing development of infrastructure and services to deliver scientific insights, that improve health and healthcare of the UK and worldwide populations. The successful candidate will be expected to provide individual contribution as a full stack hands-on engineer, work across the team's technical products and with wider Technology Ecosystem development teams, carry out code review & quality checks and document as required, as well as

document product designs and logical flows. The chosen applicant will play a key role in providing technical input to internal and external meetings and workshops. They will utilise their technical knowledge to translate technical requirements from Product Owners and key external groups to develop high level digital architecture designs.

Main Responsibilities:

- Software Development:
    - Hands-on Full Stack software development
    - Developing all different aspects of the Technology Teams Products including Search, Content Management, APIs, Visualisations and Integrations
    - Working to an agile methodology
    - Documenting code, conducting code reviews with the team and maintaining high quality, performant and testable code
- Technical architecture and design, including:
    - Meeting with a range of stakeholder groups, collecting and translating requirements into high level architecture designs, including but not limited to:
        - Application modelling and logical flows
        - Database Schema design, with best practice and optimisation in mind
        - Mapping information flow between interoperable systems
    - Documentation of architectures and designs as well as on-going ownership of documentation
    - PSR standards and optimisations surrounding code
    - Continually monitor and expose candidates for refactoring within our local and wider code projects
    - Monitor and administer application updates as and when release candidates are prepared
- Technical leadership
    - Troubleshooting and supporting development issues as they arise working with the team and escalating to Technical Programme Director as necessary
    - Demonstrable ability to collaborate and guide external partners on how to utilise, and integrate with, our new developments.
    - Maintain and share awareness of current best practices in software development, open science, reproducibility and agile methodology
    - Demonstrate technical leadership by voicing concerns about proposed solutions and offer alternatives where appropriate
    - Lead technically on developments of proofs of concept to completion, including design and documentation of new systems

Continuous Improvement:

HDR UK is dedicated to continuous improvement through our quality management system and demonstrated by our commitment to achieve ISO 9001 accreditation. The post-holder will review, analyse, identify and implement opportunities for quality improvement within their specialism and as part of the wider team through our strategy development and internal audit processes.

Key contacts / relationships:

The successful candidate will need to work collaboratively across the Technology team: Technical Programme Director, Product Owners, Chief Solution Architect, Business Analysts and the wider Technology Ecosystem community.

Knowledge, skills and experience

Essential:

- Experience working in an agile / scrum software development team
- Comfortable operating across national teams and different strategic initiatives (i.e. science and technology)
- Experience using Confluence, JIRA, Trello or similar Agile project management tools
- 7+ years software development experience
- Exceptional attention to detail
- Demonstrable experience using Git (preferably GitHub)
- Have worked with software development best practice (e.g. testing, continuous integration, documentation, release management)
- Have been through all software development life cycle stages (requirements, prioritisation, specification, design, code and test).
- Delivered code in an iterative project management-based context.
- Worked as part of a team of engineers (four or more concurrently) working on a codebase.
- Project Management skills
- Excellent communication and interpersonal skills
- Excellent time management and organisational skills
- Excellent writing and technical documentation skills
- Ability to work independently and as part of a team
- Ability to liaise confidently and effectively with a range of individuals
- Willingness to learn and develop
- A good BSc. (2:1 or better) in Computer Science or other related subject with a strong computational component or equivalent experience
- Experience presenting at technical and non-technical workshops
- Ability to research, adapt to and adopt new technologies and approaches
- Experience in ongoing mentoring and professional development of other technical staff
- While our technology team is language agnostic, a core understanding of ReactJS (Next.js) and PHP (Laravel) is required, as it makes up the majority of our tech stack
- Proficient in English

Desirable:

- A good understanding of health data research
- Experience of working within academia as well as industry

- Google Cloud Platform experience
- Experience using ElasticStack, specifically Search
- Working knowledge of front and back-end testing frameworks such as Cypress and Pest
- JavaScript, GO, and/or Python knowledge
- A working knowledge of Google's Material UI
- Experience with WCAG Accessibility guidelines
- Kubernetes and/or Docker orchestration experience
- Distributed Open Development
- 2+ years' experience working with SQL Technologies (Maria DB/MySQL)
- Active awareness of researcher/practitioner communities in relevant domains adjacent to Health Data (e.g. bioinformatics, bio/medical data visualisation, machine learning)
- Awareness of existing and emerging standards and technologies for reproducible computational science

Dimensions

- This is a full-time role. We are happy to consider job share applications or consider applications for part time hours. Travel in the UK may be required to partner organisations
- HDR UK is a national institute, and our activities take place across the UK

Application Process

How to apply: Unless specified, please apply using our online portal. We use a recruitment process that is based on finding out more about the relevant skills and knowledge an applicant has and to help us with this we ask you 3 or 4 skills-based questions as part of the application process.

We will ask you to upload your CV and covering letter, these will be anonymised and will be used if you are shortlisted.

Please contact **recruitment@hdruk.ac.uk if you have any queries regarding your application.**

Summary of Benefits

- 27 days annual leave plus 8 days for Bank Holidays
- Annual leave purchase scheme
- Medical Cash-Plan and Doctorline
- Wellbeing support, including access to the TogetherAll app
- Generous pension scheme, with 10% employer contributions

Equal Opportunities Policy Statement

Health Data Research UK is an equal opportunities employer, and as such aims to treat all employees, consultants and applicants fairly. It is our policy to provide employment equality to all, irrespective of:

- Gender, including gender reassignment
- Marital or civil partnership status
- Having or not having dependants
- Religion or belief
- Race (including colour, nationality, ethnic or national origins)
- Disability
- Sexual orientation
- Age

We are opposed to all forms of unlawful and unfair discrimination. All job applicants and employees who work for us will be treated fairly and will not be unfairly discriminated against on any of the above grounds. Decisions about recruitment and selection, promotion, training or any other benefit will be made objectively and without unlawful discrimination.

Safeguarding

HDR UK is committed to robust safeguarding policies, we expect everyone who works with us to share our commitment to safeguarding.