THE UNIVERSITY OF MANCHESTER

PARTICULARS OF APPOINTMENT

FACULTY OF BIOLOGY, MEDICINE AND HEALTH

SCHOOL OF HEALTH SCIENCES

DIVISION OF IMAGING, INFORMATICS AND DATA SCIENCE

RESEARCH ASSOCIATE IN MACHINE LEARNING FOR DIGITAL PHENOTYPING – CONNECT

Salary:	£38,448 - £46,970 per annum depending on relevant experience
Hours:	1.0 FTE
Duration:	December 2026 or ASAP for 8 months in first instance
Location:	Oxford Road, Manchester
Responsible to:	Professor John Ainsworth

Enquiries about interviews:
Name: John Ainsworth
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BACKGROUND

The NHS has a clear digital agenda for addressing mental health challenges by harnessing the information gathered from technology and self-management in long-term conditions. Our long-term vision is to improve the quality of life of people with psychosis while also reducing the impact and financial burden on service providers. Continuous symptom monitoring coupled with models that accurately and reliably predict relapse will contribute to this vision.

Our Wellcome Trust funded CONNECT study will recruit individuals with psychosis and use smart phone apps to collect passive and active data using a prospective observational cohort study design. We will use this data to develop and validate a personalised risk prediction algorithm for relapse. Additionally, we want to maximise engagement and information obtained from digital remote monitoring by asking the right questions, at the right frequency and time; this project will also examine statistical methods of achieving this.

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As part of this project, we are recruiting a **Research associate in Machine Learning for Digital Phenotyping,** who will join the digital phenotyping research group led by Prof John Ainsworth, and work as part of a multidisciplinary team on the CONNECT study.

JOB DESCRIPTION

The postholder's main duty will be to provide data science and machine learning expertise to the CONNECT project, with responsibility for:

1) **Development, and validation, of a risk prediction model for relapse.** Using data from the prospective study, you will develop/train a risk prediction model that can be used to identify patients at risk of relapse. This will use data from a variety of sources including symptoms recorded in real-time through a mobile phone app, and passively collected data such as geolocation. The model will be dynamic (updating predictions as patients record new data). An experimental approach will be taken to explore different predictors and machine learning methods.

Methodological approaches may include (but not be limited to) machine learning techniques particularly those that handle longitudinal complexity and memory such as recurrent neural networks, and other time series analytic approaches. The post holder will be responsible for applying these methods/models to the data collected in the study, and associated datasets. Throughout all activities, the post holder will be expected to work in a transparent and reproducible manner, including when writing coding scripts.

Other tasks will include:

- collaborating with a team of software engineers to develop a digital platform for collection and analysis of the real-time sample data
- liaising with clinicians, clinical academics, patients and other stakeholders to inform the modelling approaches
- Undertake academic literature searches, as needed, to identify appropriate statistical methods/ machine learning approaches that might be suitable to address the project aims
- Writing of reproducible code scripts
- Coordinate and execute agreed data cleaning and data management processes
- Prepare project updates and presentations for investigators at national and international meetings to convey progress to other stakeholders of the collaboration
- Contribute to the preparation of research outputs relating to the project, including technical reports/ summaries, presentations and peer reviewed publications
- To conduct other research on issues relating to health informatics and data science, as agreed with line manager.
- Support other researchers on the project regarding the development and application of statistical and machine learning methods.
- Work alongside the project team across all sites in a collegiate manner
- Support and adhere to data management and information protection frameworks and to data quality processes.
- Participate in all meetings relating to the project, and the Centre for Health Informatics as a whole.

This role will be particularly appealing to anyone who has an interest in developing and applying novel machine learning methods, to address real-world mental health challenges. The post holder will be part of a large and multi-disciplinary team as part of the Wellcome Trust funded CONNECT study. They will be

based within the University's Centre for Health Informatics, which has expertise in data management/ analysis and statistical methodological development in areas including prediction and causal modelling. There will be ample opportunities for engaging with the wider machine learning and data science community through the University's Institute for Data Science and AI and through the national Alan Turing Institute.

This job description is intended as a guide and may be amended in discussion with the post holder to meet changing circumstances.

PERSON SPECIFICATION

Essential Skills, Knowledge and Experience:

- Hold a PhD ideally in artificial intelligence or machine learning or equivalent research experience.
- An emerging academic publication record in high impact journals.
- Track record of applying machine learning to bio/health data.
- Deep knowledge of relevant machine learning methods.
- Extensive experience of programming for machine learning for data science (e.g., Python, TensorFlow).
- Extensive experience of using HPC resources with very large datasets.
- Strong problem-solving skills and the ability to evaluate alternative courses of action and formulate recommendations.
- Strong verbal, presentation, written, and interpersonal communication skills.
- Ability to work autonomously and as part of a collaboration.
- Effective time management skills including the ability to adhere to agreed timelines.

Desirable:

- Experience with high fidelity data such as those collected from mobile phones and wearables.
- Experience of researching areas related to mental health.
- Experience of writing scripts in a reproducible and transparent way; for example, embedding script development within Git/GitHub pipelines.
- Ability to explain complex data science issues to a non-data science audience.

Expectations and success factors:

- To be a proactive team member and treat all colleagues and students with respect in accordance with the established Academic Behaviours.
- To be willing to work across organisational boundaries.
- To seek new knowledge and share ideas.
- To be open and responsive to change and innovation.

The University of Manchester

The University of Manchester was established in 1824, bringing together The Victoria University of Manchester and UMIST to form The University of Manchester. It has an excellent track record in research, as demonstrated by a research power and specifically by the award of two Nobel prizes in physics in 2010. The University's research strategy can be found via the following link: UoM Research Strategy.

The academic structure of The University of Manchester is made up of Faculties and Schools. There are four Faculties and further information about each Faculty and its related Schools can be found at UoM Faculties and Schools.

The Faculty of Biology, Medicine and Health

The University of Manchester is the largest single-site university in the UK with around 38,000 students and more than 11,000 staff. We aim to become one of the leading civic universities in the world by 2035 and are committed to delivering an outstanding teaching and learning experience; contributing to the social and economic success of local, national and international communities; producing the highest calibre graduates; and developing our staff to be amongst the very best of their peers. To achieve our ambitious goals, we aim to attract and retain the very best people to work across a range of academic disciplines and support functions.

The Division of Informatics, Imaging and Data Science

The division of Informatics, Imaging and Data Science **(**IIDS**)** led by Professor John Ainsworth, conducts world-leading research in health informatics and forms a centre of excellence in digital health innovation for North England. The division has a national role in driving advanced methodological research to harness health data; and to build capacity in health informatics. IIDS has a long history of health informatics research, including deep analysis of electronic health records at a UK-scale. Additionally, IIDS provides an environment for industry and academia to collaborate over UK health data, methods and expertise in in a timely, cost effective and citizen-engaged way, benefiting the UK economy. The division runs a portfolio of research with over 20 projects/programmes with a value more than £60M.