



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

**Research Fellow in Machine Learning for African Weather Prediction,
Faculty of Environment**



Salary: Grade 7 (£41,064 – £48,822 p.a. depending on experience)

Reporting to: Douglas Parker

Reference: ENVEE1829

Fixed term until 30 September 2027 to complete specific time limited work

Location: University of Leeds (with scope for hybrid working)

We are open to discussing flexible working arrangements

Research Fellow in Machine Learning for African Weather Prediction, Faculty of Environment

Overview of the Role

Are you a Computer Scientist looking to apply your expertise to real-world weather forecasting challenges in Africa?

Machine-learning has the potential to revolutionise weather prediction for and in Africa, and we are seeking a machine-learning specialist ready to embrace challenges in weather prediction, with the aim of creating operational systems benefitting millions of people across Africa.

The Cumulus project is a consortium of UK and African partners funded by the Gates Foundation, which aims to make a breakthrough in the application of machine-learning forecasting methods for West African agriculture. The project is led by the UK's Alan Turing Institute, with partners in Senegal and Ghana, and all partners will collaborate closely. We will also be part of an over-arching project – Nimbus – linking with East African teams and other international specialists.

Within Cumulus, you will lead the development of “downscaling” methods for sub-seasonal (2-4 week) forecasts. Our priority will be to implement deep-learning based methods, to turn global sub-seasonal predictions (which are at quite coarse spatial resolution and have systematic biases) into accurate, actionable information for farmers at their “field scale”. The machine-learning methods will include training with data from Africa not normally available for routine forecasting, and we will explore the value of local optimisation or fine-tuning of foundation codes. Handling spatio-temporal statistics of forecast uncertainty will be a key consideration. This kind of downscaling with machine-learning methods is a rapidly advancing field and it is an exciting time to influence the development of the methods. We aim to get the first codes developed rapidly, and to ensure that code can be run, evaluated and improved by our partners in African universities and weather services in Senegal and Ghana. Evaluation and benchmarking of the predictions will be a major priority, working with colleagues across the project and across Africa.



Main duties and responsibilities

- Designing and implementing machine learning-based forecasting and downscaling systems for Africa;
- Designing suitable computational approaches for the operational use of these systems in the UK and in Africa;
- Management of datasets for the training and operation of these systems;
- Working with other project members to design suitable evaluation of the models;
- Working with African partners to support the implementation of the forecasting and downscaling tools in operational services in Senegal and Ghana;
- Collaborating in knowledge exchange with African peers, to support their training, and your own;
- Generating and pursuing independent and original research ideas in the appropriate subject area;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team including preparing continuation proposals for funding in collaboration with colleagues;
- Evaluating and benchmarking methods and techniques used and results obtained by other researchers and to relate such evaluations appropriately to your own work;
- Preparing papers for publication in leading international journals and disseminating research results through other recognised forms of output;
- Working both independently and also as part of a larger team of researchers in the UK and Africa, engaging in knowledge-transfer activities where appropriate and feasible;
- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues in the UK and Africa as appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.



Qualifications and skills

Essential

- A PhD or near completion (must be submitted prior to starting in post) in Computer Science, Machine Learning or a closely allied discipline;
- A strong background in the following: (1) computational data analysis and modelling, in a unix environment and (2) deep learning;
- Demonstrated ability to organise data and computational pipelines to enable the training and deployment of machine-learning methods;
- High level experience of different computational environments, including cloud computing;
- Demonstrated ability to train and deploy working models which can be used and deployed operationally by partners and clients;
- Good time management and planning skills, with the ability to meet tight deadlines to bring research to a successful conclusion, manage competing demands and work effectively under pressure without close support;
- A developing track record of peer reviewed publications in international journals;
- Excellent written and verbal communication skills including presentation skills;
- A proven ability to work well both individually and in a team;
- A strong commitment to your own continuous professional development and supporting other colleagues in their professional development;
- Willingness to travel to Africa to collaborate with partners in the region.

Desirable

- Experience of pursuing external funding to support research;
- Machine learning approaches to weather or environmental prediction;
- Experience of African environmental challenges.

Additional information

Please note: If you are not a British or Irish citizen, from 1 January 2021 you will require permission to work in the UK. This will normally be in the form of a visa but, if you are an EEA/Swiss citizen and resident in the UK before 31 December 2020, this may be your passport or status under the EU Settlement Scheme.



Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information please visit: www.gov.uk/skilled-worker-visa

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information please visit: <https://www.gov.uk/global-talent>

Find out more about the [Faculty of Environment](#).

Find out more about our [School](#).

Find out more about our [Research and associated facilities](#).

Find out more about [Equality in the Faculty](#).

Our University

As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Environment we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Environment has received a prestigious Athena SWAN silver award from [Advance HE](#), the national body that promotes equality in the higher education sector. This award represents the combined efforts of all schools in the Faculty and shows the positive actions we have taken to ensure that our policies, processes and ethos all promote an equal and inclusive environment for work and study.

Working at Leeds

We are a campus based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our [Working at Leeds](#) information page.



Information for disabled candidates

Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found on our [Accessibility](#) information page or by getting in touch with us at hr@leeds.ac.uk.

Criminal record information

Rehabilitation of Offenders Act 1974

A criminal record check is not required for this position, however, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be, in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our [Criminal Records](#) information.

