UNIVERSITY OF LEEDS

Post-Doctoral Research Fellow in Population Modelling for Urban Analytics

School of Geography, Faculty of Environment

Salary: Grade 7 (£32,548 – £38,833 p.a.)

Reference: ENVGE1114

Fixed term for 2 years

Open to flexible working considerations

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Are you an ambitious researcher looking for your next challenge? Do you have a background in computer simulation, statistics, and data analytics? Do you want to further your career in one of the UK's leading research-intensive Universities?

Cities have emerged as the dominant form of economic and social organisation at a global scale. The new science of *urban analytics* envisions step changes in the health, prosperity, welfare and the quality of life for city inhabitants. It proposes to do this through the extraction of value from new and emerging forms of data, and by the development and deployment of methods in artificial intelligence and data science. As a long-established centre of excellence for spatial analysis and geocomputation, Leeds is taking a leading role in driving the international research agenda for urban analytics.

The Leeds Institute for Data Analytics (LIDA) at the University of Leeds, in partnership with the Alan Turing Institute, is seeking a post-doctoral researcher to join our emerging Urban Analytics group. We are looking for an ambitious and driven researcher with the capability, inventiveness and initiative to work alongside our established team of internationally recognised academics to drive this activity to higher levels.

LIDA currently hosts 36 major programmes with research funding in the order of £50 million (www.lida.ac.uk). Successful applicants will also have the opportunity to develop international collaborations and relationships by working with scientists overseas at our partner Universities. This position will therefore provide outstanding new networks for postdoctoral researchers to develop an exceptional programme of research innovation in line with the main aims of the project.

You should have a PhD (or be very close to obtaining a PhD) in Geography, Computer Science, Mathematics/Statistics, Physics – or a related discipline with a significant component of programming and/or data science – and be able to demonstrate a

combination of enthusiasm and expertise in computational modelling and data analysis.

You will be primarily responsible for building a dynamic microsimulation model for high resolution population estimation. The model will be used for a wide range of policy ananlysis within both urban and non-urban areas. Therefore, expertise in individual based modelling (e.g. microsimulation, agent based modelling) would be a distinct advantage.

What does the role entail?

Duties for the Research Fellow includes:

- Building dynamic microsimulation models which capture population change and life-course trajectories;

- Analysis of policy implications of population change at a fine spatial resolution;

- Contributing new ideas and perspectives to the wider Urban Analytics group;

- Writing high quality, robust, well documented computer software;

- Producing high quality research papers for publication in academic journals;

- Disseminating findings from the research project by preparing and delivering research presentations at conferences or other forums;

- Contributing to the development of new research funding applications, either in a leading role or as a co-investigator;

- Planning and managing your own research activity in collaboration with the project investigator and other members of the Urban Analytics team;

- Working both independently and also as part of a larger team of researchers, both at Leeds and the Alan Turing Institute, engaging in knowledge-transfer activities where appropriate and feasible;

- Maintaining your own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;

- Contributing to the training of both undergraduate and postgraduate students, where appropriate, 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.

What will you bring to the role?

As Research Fellow you will have:

- A PhD or equivalent research experience in Geography, Computer Science, Mathematics, Statistics, Physics, or a related discipline with a significant component of programming and/or data science;
- Expertise in developing individual based models using techniques such as microsimulation or Agent Based models;
- An ability to think creatively when standard techniques or libraries are not suitable, in order to develop novel, innovative solutions to complex problems;
- Expertise in a range of data science approaches, for example machine learning, agent-based modelling, monte-carlo methods, statistical modelling, or microsimulation;
- Experience in developing new computer software for modelling and/or data analysis and knowledge of (or an enthusiasm to learn) languages that are commonly used in the research group such as Python, C++, Stata, R and Java;
- An ability to write high-quality research papers with an emerging track record in the publication of scholarly articles in peer-reviewed journals;
- Excellent communication skills including evidence of having presented work at a high academic level and an ability to explain complicated technical work to colleagues in diverse fields;
- A proven ability to work closely with a small group of scientists and collaborate with a wider, multidisciplinary team;
- A strong commitment to your own continuous professional development;
- Ability to use initiative to develop and pursue new research ideas and algorithms in line with the requirements of the project.

You may also have additional abilities that are relevant to the project:

- Evidence of winning funding for research projects;
- Expertise in Geographical Information Systems: ArcGIS, Mapinfo, R, QGIS or similar.

How to apply

You can apply for this role online; more guidance can be found on our [How to Apply](#) information page. Applications should be submitted by 23.59 (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Dr Nik Lomax
Tel: + 44(0)113 343 3321
Email: N.M.Lomax@leeds.ac.uk

Additional information

Find out more about the [Faculty of Environment](#) and [School of Geography.](#)
Find out more about [Athena Swan](#) in the Faculty.

Details about the Turing Project

1. SPENSER – a Synthetic Population Estimation and Scenario Projection model.

SPENSER is a synthetic population estimation and projection model which uses dynamic microsimulation. It provides the framework for estimates and projections of populations under different demographic, socioeconomic, infrastructure or other scenarios. SPENSER also provides a comprehensive set of tools for user created customisable scenario projections. The interactive interface allows users to set assumptions for the future (e.g. around economic, policy, health changes) which are translated to underlying demographic constraints (e.g. mortality, fertility, migration). The model draws on longitudinal datasets to estimate transition probabilities under different assumptions and allows users to generate 'what if' scenarios which can be translated to small area projections.

See: https://niklomax.github.io/Turing/

Working at Leeds

You can find out more about our generous benefits package and more about what it is like to work at the University and live in the Leeds area on our [Working at Leeds](#) information page.

Candidates with disabilities

Information for candidates with disabilities, impairments or health conditions, including requesting alternative formats, can be found on our Accessibility information page or by getting in touch with us at disclosure@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.