



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Simulating Urban Systems

School of Geography, Faculty of Environment



Salary: Grade 7 (£33,199 – £39,609 p.a.)

Reference: ENVGE1092

Closing date:

Fixed term for 3 years (External Funding)

Open to flexible working/job sharing considerations

Research Fellow in Simulating Urban Systems

School of Geography, Faculty of Environment

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?

You will work on a new project, funded by the European Research Council, called [Data Assimilation for Agent-Based Models](#) (DUST). The ultimate aim of the project is to develop a comprehensive simulation that can be used to model the current state of an urban area and provide valuable information to policy makers. Agent-based modelling is an ideal methodology for this type of simulation but one that suffers from a serious drawback: **models are not able to incorporate up-to-date data to reduce uncertainty**. There is a wealth of new data being generated in 'smart' cities that could inform a model of urban dynamics (e.g. from social media contributions, mobile telephone use, public transport records, vehicle traffic counters, etc.) but we lack the tools to incorporate these streams of data into agent-based models. Instead, models are typically initialised with historical data and therefore their estimates of the current state of a system diverge rapidly from reality.

The research team is led by [Dr Nicolas Malleson](#) and will be located within the Leeds Institute for Data Analytics (LIDA), which has been established with more than £20 million of funding from the University and four major research councils. The city of Leeds is already recognised as a hub for big data analytics in business, health care and academic research. In addition, the University has also recently become a partner in the [Alan Turing Institute](#), which is the UK's national institute for data science, and this new collaboration offers exciting opportunities for LIDA researchers to engage with scientific leaders from a range of fields.

Further information on the project and The Leeds Institute for Data Analytics (LIDA) can be found on the Additional Information sheet.



What does the role entail?

As Research Fellow, your main duties will include:

- Working with the project investigator and colleagues at Leeds and with partners to develop an agent-based simulation that will model the dynamic flows of people around urban areas;
- Integrating new data assimilation methods, that are under development by the team, to incorporate streams of real time data into the agent-based model to reduce uncertainty;
- Writing high quality, robust, well documented computer software;
- Preparing research papers and other material for publication;
- 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 manage your own research activity in collaboration with the project investigator;
- Working both independently and also as part of a larger team of researchers, 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 near completion - i.e. the initial thesis needs to have been handed in at the point of application, in Geography, Computer Science,



Mathematics/Statistics, Physics – or a related discipline with a significant component of programming and/or data science;

- A demonstrable ability to develop efficient, robust and well-documented computer software and confidence in the use of a high-level, object-oriented programming language;
- An awareness of simulation techniques and enthusiasm to apply them in the context of modelling cities;
- Skills in the acquisition, manipulation and analysis of diverse forms of data (e.g. surveys, census tables, social media data streams, spatial data);
- Experience in planning and developing new software for modelling and/or data analysis;
- 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 effectively with others in a multidisciplinary team environment and to manage competing demands effectively, responsibly and without close support;
- A strong commitment to your own continuous professional development.

You may also have:

- Direct experience in using and building agent-based models;
- Direct experience with data assimilation and/or related techniques;
- Expertise in the use of mathematical/statistical packages such as Matlab or R.

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:

Associate Professor Nick Malleson

Tel: +44 (0)113 343 5248

Email: n.s.malleson@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.

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.

