



UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Choice Modelling and Machine Learning, Faculty of Environment



Salary: Grade 7 (£33,797 – £40,322 p.a.)

Due to funding constraints, an appointment will not be made above £36,914 p.a.

Reference: ENVTR1124

Fixed-term until 14 November 2022

We will consider flexible working arrangements

Research Fellow in Choice Modelling and Machine Learning Institute for Transport Studies, Faculty of Environment

Do you have research expertise in Machine Learning and/or Choice Modelling? Are you interested in conducting methodological research to bridge these disciplines? Would you like to implement novel methodologies to advance the state-of-the-art transport models and make a real-world impact?

Transport choice models have historically relied on manually collected survey data that are expensive to obtain and generally have limited sample sizes and lower update frequencies. They are also prone to biases and reporting errors. On the other hand, over the last decade, passively collected big data sources have emerged as a very promising source of mobility data for researchers and practitioners. These include GPS traces, mobile phone records, bank and loyalty card transactions and geo-coded social-media data. However, the application of these data have been primarily limited to visualizations and development of machine learning based predictions.

The machine learning techniques for analyzing big data are however very often data-driven and lack behavioural underpinning which questions their applicability in predicting behaviour in radically different future scenarios. The effective combination of machine learning and choice modelling offers the promise to make better use of the strengths of both types of data and enable us to develop better and more comprehensive models, potentially at lower costs.

The [NEXUS](#) project, funded by the Future Leader Fellowship Programme of the UKRI, looks at developing next-generation mathematical models of travel behaviour that can better predict the decisions made by travellers in the fast-evolving mobility landscape by augmenting traditional choice modelling techniques with insights from machine learning. We are looking for a committed, highly motivated and innovative individual with machine learning and/or choice modelling background to work in this exciting long-term research project.

As a member of the team, you will be working with Dr Charisma Choudhury (UKRI Future Leader Fellow) and Dr He Wang (Co-Investigator, School of Computing). You will be based at [Institute for Transport Studies \(ITS\)](#) with cross-university collaborations through the Choice Modelling Centre ([CMC](#)) and Leeds Institute for Data Analytics ([LIDA](#)). You are expected to contribute to methodological research on



bridging machine learning and choice modelling in the context of transport. You will also contribute to the empirical component of the project and have the opportunity to work with researchers at the [Alan Turing Institute](#) – UK's national centre for data science and artificial intelligence as well as two non-academic partners: [Citi Logik](#) and [Asian Development Bank](#). As this is a multi-faceted research project, you will be able to contribute to individual components of the work as well as helping to shape the direction of the research according to your own interests and background. You will be expected to take academic ownership of large parts of the programme and make a lasting contribution to the field.

What does the role entail?

As a Research Fellow, your main duties will include:

- Working with Dr Charisma Choudhury and Dr He Wang in successful execution of the research project NEXUS;
- Generating and pursuing original research ideas in bridging choice modelling and machine learning;
- Developing research objectives and proposals and contributing to setting the direction of the research project and team;
- Providing a supporting role in a large-scale primary data collection to support the attainment of the research objectives;
- Working with novel secondary data provided by non-academic partners and primary data collected as part of the project;
- Travelling within the UK and internationally (COVID-19 restrictions permitting) for training and dissemination events. This includes a potential 4-8 weeks research visit in Philippines to work closely with the Asian Development Bank;
- Evaluating 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, engaging in knowledge-transfer activities where appropriate and feasible; Supporting the management of the project (e.g. helping in organising workshops, seminars etc.);
- Maintaining own continuing professional development and acting as a mentor to less experienced colleagues as appropriate;



- Contributing to the training of 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.

What will you bring to the role?

As a 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 Machine Learning (e.g. statistical machine learning and deep learning), Choice Modelling or a closely allied discipline;
- A strong track record of developing and refining mathematical models and applying them to different decision contexts;
- Computer programming skills and evidence of working with large datasets;
- A track record of peer-reviewed publications in international journals;
- Good time management and planning skills, with the ability to meet tight deadlines, manage competing demands and work effectively under pressure without close support;
- A proven track record of peer-reviewed publications in high impact factor journals;
- Excellent written and verbal communication skills including presentation skills;
- A proven ability to work well both individually and in a team;
- Willingness and ability to travel within the UK and internationally (COVID-19 restrictions permitting) for training and dissemination events;
- A strong commitment to your own continuous professional development.

You may also have:

- Experience of pursuing external funding to support research;
- Experience in doing interdisciplinary work;
- Experience with working in a collaborative project involving remote partners;
- Ideas for ways in which the project could stimulate engagement with policy makers and/or the public.



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:

[Charisma Choudhury](#), Associate Professor

Tel: +44 (0)113 343 2659

Email: c.f.choudhury@leeds.ac.uk

Additional information

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

Find out more about the [Institute for Transport Studies](#).

Find out more about the [Choice Modelling Centre](#).

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

A diverse workforce

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

Find out more about the benefits of working at the University and what it is like to live and work 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 page.

