PhD in choice modelling

Topic: Behavioural flexibility in choice modelling - bridging the gap with behavioural economics and mathematical psychology.

Supervisors: Professor Stephane Hess & Dr Charisma Choudhury.

Host school: Institute for Transport Studies
(with cross-university collaborations through the Choice Modelling Centre).

Start date: flexible, available from 1 December 2014.

Funding and duration: an enhanced stipend of £17,859 per year (figure for 2014/2015) is available for a duration of up to 3.5 years.

Eligibility for funding: UK/EU students.

Entry requirements: A first class (or equivalent) undergraduate degree related to mathematics or statistics from a reputed university is desirable. Candidates with an upper second class (or equivalent) degree from excellent universities will also be considered, especially if the candidate has a Masters degree and/or practical experience in a highly relevant area. Experience of mathematical modelling and/or computer programming skills is also desirable.

Background: We are looking for a highly motivated student to conduct PhD research in the field of choice modelling. Choice modelling is a key analytical tool used to understand consumer decisions and valuations and forecast choices across a range of topic areas, including transport, environmental and health economics, and regional science. Their outputs form a key component in guidance underpinning government and industry decisions on changes to policy, infrastructure developments or the introduction of new services or products.

This role provides an exciting opportunity to contribute to a major cross-disciplinary research programme at the heart of the new Choice Modelling Centre (www.cmc.leeds.ac.uk) set up within the University of Leeds. The five year DECISIONS project, funded by the European Research Council (ERC) seeks to make a step change in choice modelling. The project aims to develop a new framework which realigns modelled behaviour with real world behaviour, incorporating links between long term decisions and day to day choices, and accounting for the growing importance of virtual social networks and the role of joint decisions.

Topic: Given the significant financial, environmental and societal implications of government and industry decisions guided by choice modelling outputs, model accuracy is crucial. Current models however, while powerful and flexible, still present a highly abstract representation of consumer decisions. At the same time, a substantial body of research in behavioural economics and mathematical psychology has put forward numerous alternative theories of individual decision making, with increasing levels of flexibility. Many of these theories have also had widespread public exposure in bestselling books such as *Predictably Irrational* or *Thinking, Fast and Slow*. Empirical tests of these theories have however largely been limited to small scale experimental settings and have thus far failed to make the full transition into large scale modelling of real world decision making. This PhD is concerned with bridging the gap between traditional choice modelling and these alternative disciplines, aiming to realign modelled behaviour with real world behaviour.

Tentative research questions: The research is likely to evolve over the course of the PhD, but will for example seek to address the following questions:

- How do individual people make decisions and how can we represent these mathematically?
- How can we operationalise theories from behavioural economics in large scale models?
- What are the benefits of increasing behavioural diversity, and what are the pitfalls?
- How can we capture interactions between decision makers in data and in our models?

Enquiries, including on how to apply and funding details, may be made via telephone/email to Professor Stephane Hess www.its.leeds.ac.uk/people/s.hess