School of Mathematics and Statistics

FUNDED PHD OPPORTUNITY

Bayesian Models for Preference Networks

Supervisor: **Dr Alberto Caimo** Co-supervisor: **Dr Luiza Piancastelli**

STIPEND	DURATION	START	APPLY BY
€25,000 / year	**Up to 4 years**	**1 Sept 2027**	**8 Jan 2027**
Tax free; plus €3,500 travel	full-time	UCD Belfield, Dublin	Results by March 2027

The project

Why do people prefer one product, candidate or AI-generated answer over another? Preference data shape decisions in many areas, from online shopping and elections to sports and the evaluation of AI systems. Yet preferences are not always as simple as ranking items from best to worst: people may disagree, change their minds, or express preferences that form cycles (A over B, B over C, but C over A).

This project will develop new probabilistic models to understand preferences as **relationships between items**, rather than simply assigning each item a score. It will:

- investigate how the sets of items being compared are formed, and how comparisons depend on one another;
- develop models that capture cycles, differences between items and variation in individual preferences;
- study the theoretical foundations of these models, including identifiability and consistency, and develop efficient Bayesian inference methods.

The models will be applied to real-world data, from online consumer choices to human evaluations of AI systems, with the aim of producing more flexible and reliable rankings and recommendations.

The candidate

The ideal candidate has a **solid background** in Statistics, Mathematics or Computer Science and a strong interest in probabilistic modelling, network data and computational methods. Prior experience with Bayesian inference, statistical computing or machine learning is an advantage.

More information

- **Informal enquiries** are welcome: alberto.caimo1@ucd.ie or luiza.piancastelli@ucd.ie
- PhD scholarships 2027 Competition
- Terms and conditions (PDF)

How to apply

Submit your application to the School Graduate Administrator via the online form:

Apply online →