EPSRC DTP PhD Research Project

Project Title: Developing Bayesian approaches in network science

Primary Supervisor details:

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Department: Psychology; Computer Science

Location: Washington Singer Laboratories, Streatham Campus

PhD Programme: PhD in Psychology

Project Description:

Quantifying networks has numerous applications, from food webs to neural networks, from workplace dynamics to online behaviour. Yet network data poses challenges to robust analysis due to its non-relational nature, the point-estimates used to measure networks, and the sparsity of data often associated with nodes. New approaches based on generative models and Bayesian theory hold promising to solutions to some of these challenges. Yet these approaches remain in their infancy and further development in new and fruitful directions is required. This project will build on a new framework for Bayesian Inference in Social Network Analysis (BISoN). Directions for development will be informed by the interests and expertise of the successful candidate but could include topics such as multiple-membership and social relations models, analysis of spatiotemporal data, dynamic networks, graph implementation, and comparative network analysis. Simulated and empirical data from real-world study systems (humans, other animals) are available for exploration and validation of approaches. Outcomes of this project will result in new tools that will enhance our understanding of networks, their latent processes and quantification. As such, this project holds applied relevance across diverse fields, from network science to quantitative social science, from mathematics to sociology, from health sciences to

psychology.

Entry Requirements:
Experience in a relevant field, including computer science, mathematics, networks science, social or behavioural sciences.

Project specific enquiries:
For project enquiries, please contact lead supervisor, Professor Lauren Brent, Department of Psychology, l.j.n.brent@exeter.ac.uk