School of Mathematical Sciences
PhD Studentships

Project title: Multi-Layer Spatiotemporal Generalized Networks: Theory and Applications

Project area: Complex systems

Supervisors: Vito Latora, Rosemary Harris

Start date: January 2013

Project details: This studentship will be in the area of complex systems and complex networks. Thanks to modern ICT, a new generation of large datasets of social, biological, and man-made systems is now available. Such data contain high precision and integrated information on the nature and the evolution, in space and time, of the state of each single component, together with information on different types of interactions between them. Unfortunately, it is extremely difficult to extract meaningful information from this new generation of high-integrated data, since current network theory provides not much more than a static description of single, independent networks. The aim of this project is to provide a coherent theoretical framework for analyzing and modeling these dynamic and multi-layer networks in terms of multi-graphs embedded in space and time. The theory will be validated on real-world applications involving large and heterogeneous data sets of brain networks, on- and off-line social systems, healthcare systems, and transportation flows in cities. The project will be highly inter-disciplinary and combine analytical approaches and computational methods.

Suitable candidates: The successful candidate should have a strong analytical background in a relevant discipline, preferably mathematics, physics or computer sciences. Interest in the field of complex networks, a proven ability to work on large-scale datasets, statistical skills, and experience in computational modeling and analysis are desirable for this position.

Funding details:
The studentship is funded by the EU FP7 project LASAGNE (multi-LAyer SpAtiotemporal Generalized Networks)

Information about the School of Mathematical Sciences:
The School of Mathematical Sciences is one of the largest UK mathematical science departments and is one of five Schools in the Faculty of Science and Engineering at Queen Mary. The School offers energetic and diverse postgraduate activity across the spectrum of mathematical sciences from pure and applied mathematics to statistics. Our staff includes international leaders in many areas of mathematical research, and the School is a hive of activity, providing a vibrant postgraduate life. For more information about the School please see
http://www.maths.qmul.ac.uk/

Contact:
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How to apply:
To apply for this studentship and for entry on to the mathematics research programme please fill in online application form at http://www.qmul.ac.uk/postgraduate/applyresearchdegrees/index.html

If you have any queries regarding the application process please contact the postgraduate administrative officer (maths-pg@qmul.ac.uk / +44 (0)20 7882 5454).

Application deadline:
Deadline for applications is 2 December 2012.