Report of the visit of Prof. Vito Latora as SICSA Distinguished Visiting Fellow

Host: Dr Mirco Musolesi, School of Computer Science, University of St Andrews

Prof. Vito Latora visited St Andrews and Scotland in June/July 2011. During this period he gave a 18-hour course on complex networks attended by staff and PhD students of various Schools of the University. The lectures were about centrality measures, random graphs, scale-free graphs, percolation, random walks, percolation and disease spreading. During his visit, he also met colleagues at Glasgow and Edinburgh.

The visit has been an occasion for exchanging ideas and outlining possible collaborations with researchers around Scotland. An interdisciplinary collaboration with biologists and applied mathematicians at the Sea Mammal Unit at St Andrews has been started during his visit. The project will be about the study of seals' trajectory using mathematical tools from complex network theory. Other projects have been started with researchers at the School of Computer Science. There have been discussions also about bidding for future funding opportunities at European level.

The visit has also been an occasion for collaborating with Dr. Mirco Musolesi on the problem of understanding, modelling and controlling spreading processes in time-varying graphs. The research problem can be summarised as follows. People tend to carry mobile devices with them while they move around their daily activities. These devices are more and more often capable of forming spontaneous networks through their short range wireless interfaces. While these networks offer a potentially powerful alternative to file exchange and communication, they are also very vulnerable to new forms of security attacks. The goal of the our work has been the definition of models of time-varying networks in order to understand and control the spread of ubiquitous computing viruses in time-varying graphs, considering two interrelated class of problems: digital virus dissemination in ubiquitous systems and human disease spreading.

Prof. Vito Latora will be back in Scotland in October: he has been invited as key note speaker at the Second SICSA Workshop on Biological Networks: Theory and Applications organised by Dr. Matthias Hennig and Pierluigi Frisco.