

## Invited Talk 1.2

### **STRUCTURE AND MODELLING OF LARGE-SCALE SOCIAL NETWORKS**

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#### **Abstract**

Electronic databases, from phone to e-mails logs, provide detailed records of human communication patterns, offering novel avenues to map and explore the structure of social and communication networks. We have studied a society-wide network derived from the calls of over seven million mobile phone users. I will highlight some of our key empirical findings and will then present a model of social networks motivated by the empirical study. By starting from a set of microscopic rules governing the formation of ties at the level of individuals, the model is able to produce macroscopic social structures that are compatible with real world social networks. In addition, the model enables us to explore the role of interaction strengths in the emergence of communities in social systems. By tuning a model parameter that governs the sensitivity of the microscopic rules to weights, the resulting networks undergo a gradual structural transition from a module-free topology to one with communities.

#### **Biography**

Jukka-Pekka Onnela is a Junior Research Fellow in Complex Systems at Wolfson College, Oxford, and an Associate Fellow at the Saïd Business School. He is also a member of the Complex Systems Group at Clarendon Laboratory, Department of Physics. He obtained his D.Sc. in 2006 from Helsinki University of Technology.

Jukka-Pekka Onnela's earlier research explored the structure of the financial market. More recently he has studied the properties of social interaction networks constructed from the mobile phone calls of a large number of individuals.