Simulating Complex Societal Networks: From molecules to mankind

Abstract:

We live in a complex world and are surrounded by complex systems: from a biological cell, made of thousands of different molecules that seamlessly work together, to millions of computer systems that should work together, to our society, a collection of six billion individuals that try to work together. These complex systems display endless signatures of order, disorder, self-organization and self-annihilation. Understanding, quantifying and handling this complexity is one of the biggest scientific challenges of our time.

Most complex systems are not made of identical and undistinguishable components, as for instance gases or magnets are; each gene in a cell, each computer in a network or individual in a country has its own characteristic behavior and provides unique value and contributions to the systems in which they are constituents. More importantly in complex systems the interactions form exquisite networks, each component being in non-linear contact with many selected interaction partners. It is not just complicated, it is complex.

In this talk I will present some results on modelling infectious diseases with Agent Based Complex Networks and introduce a theoretical framework to understand information dissipation in such complex networks. Part of this work was done within the European Dynanets project: www.dynanets.org. More information via: http://staff.science.uva.nl/~sloot/