



The Age of Networks

Everywhere we turn these days, we find that networks can be used to describe relevant interactions. In the high tech world, we see the Internet, the World Wide Web, mobile phone networks, and a variety of online social networks. In economics, we are increasingly experiencing both the positive and negative effects of a global networked economy. In epidemiology, we find disease spreading over our ever growing social networks, complicated by mutation of the disease agents. In problems of world health, distribution of limited resources, such as water resources, quickly becomes a problem of finding the optimal network for resource allocation. In biomedical research, we are beginning to understand the structure of gene regulatory networks, with the prospect of using this understanding to manage the many human diseases. In this talk, I look quite generally at some of the models we are using to describe these networks, processes we are studying on the networks, algorithms we have devised for the networks, and finally, methods we are developing to indirectly infer network structure from measured data. In particular, I will discuss models and techniques which cut across many disciplinary boundaries.

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