Information diffusion in complex networks

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Abstract

I will give a gentle introduction to the topic of complex networks. Starting from the Milgram experiment and the concept of 'Small-World', I will motivate the necessity for defining some metrics that characterize the ways in which 'information' is diffused in such complex networked systems. Then, I will introduce the concept of network communicability and illustrate the use of matrix functions for its quantitative characterization. I will then introduce a new metric, called the communicability distance. It characterizes the distance between two nodes in terms of the routes used by information to diffuse from one place to another in the network. Finally, I will extend these concepts to study networks evolving in time as well as networks where the information flows in parallel layers (multiplexes).

This talk should be accessible to graduate students.