

Time-varying networks

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ABSTRACT

Interacting agents moving over geographic space, functional relationships between the cortical areas of a brain during the performance of a task, messages and contacts over online social systems, are all examples of networks in which the links are frequently changing over time. All such systems have to be described in terms of time-varying networks, i.e. time-ordered sequences of graphs defined over a fixed set of nodes.

Concepts, metrics and models for static networks do not straightforwardly apply to time-varying networks.

In this talk we will discuss new metrics and models which allow to capture crucial information on the time ordering and eventual concurrency of links in real time-varying complex networks. We will also investigate how the additional dimension of time influences collective processes. Finally, as an application, we will show how to exploit temporal centrality measures to contain mobile phone viruses that spread via Bluetooth contacts.