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*Connectivity in Complex Networks: Measures, Inference and
Optimization*

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Abstract: Networks naturally appear in many high-impact applications, ranging from epidemic studies, social network mining to infrastructure analysis. The simplest model of networks is single-layered network, where nodes are from the same domain and links are of the same type. However, as the world is becoming increasingly connected and coupled, nodes from different application domains tend to be interdependent on each other, forming a more complex network model called multi-layered networks. Among the various aspects of network studies, network connectivity is the one that plays a foundational role in a myriad of tasks (e.g. information dissemination, robustness analysis, and community detection).

In this talk, I will present my research about the connectivity measures, inference and optimization problems in complex networks. Specifically, I will introduce (1) a unified framework to measure the connectivity in complex network systems; (2) effective connectivity inference methods for networks under dynamic and incomplete settings; and (3) theoretical analysis and approximation algorithms for the generalized connectivity optimization problems.

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