

Modeling and mining large graphs

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Abstract. Network science has emerged over the last years as an interdisciplinary area spanning traditional domains including mathematics, computer science, sociology, biology and economics. Since complexity in social, biological and economical systems, and more generally in complex systems, arises through pairwise interactions there exists a surging interest in understanding networks.

In this tutorial, we will provide an in-depth presentation of the most popular graph models used for representing real-world networks. We will then discuss efficient algorithmic techniques for mining large graphs, with emphasis on the problems of extracting graph sparsifiers, partitioning graphs into densely connected components, and finding dense subgraphs. We will motivate the problems we will discuss and the algorithms we will present with real-world applications.