Detecting Overlapping Communities in Networks Based on a Simple Node Behavior Model

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Abstract

In this talk, we propose an algorithm that detects overlapping communities in networks (graphs) based on a simple node behavior model. The key idea in our algorithm is to find communities in a local agglomerative manner such that every community S has the following property: For each node i in S we have (i) the fraction of nodes in S that are connected to node i is greater than a given threshold, or (ii) the fraction of edges of node I that are connected to S is greater than another given threshold. Through extensive computer simulations of random graphs with built-in overlapping community structure, including the LFR benchmark random graphs and Erdos-Renyi type random graphs, we show that our simple algorithm has excellent performance. Furthermore, we apply our algorithm to the real-world network “Karate club” and show that the overlapping communities detected by our algorithm are very close to the known communities in this graph.