

1086-05-141

Maggie Miller*, Department of Mathematics, University of Texas, Austin, TX 78712, and
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NY 14623. *Community Detection by Maximizing Partition Efficiency.*

We discuss how the measure of efficiency of a graph, proposed by V. Latora and M. Marchiori, can be used in community detection. We introduce a partitioning criteria called partition efficiency, which rewards well-connected clusters. Through spectral methods, we maximize this quantity via the second eigenvector of the efficiency matrix of an undirected graph. We apply this new method of graph partitioning to a U.S. Senate legislation network, and compare the maximum partition efficiency method to the community detection methods of maximum modularity, and information centrality. (Received July 27, 2012)