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Community detection by propagating the label of center

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Abstract

Community structure is a very important property of complex networks, but the way to detect it remains an open problem. A new community detection algorithm based on centers and neighbors (DCN) is proposed in this paper. This method employs the idea of density peak clustering (DPC) to detect the community centers, where the clustering centers are characterized by a higher density than their neighbors and by a relatively large distance from points with higher densities. Moreover, Chebyshev inequality is adopted to select these centers automatically. To overcome the "Domino Effect" of DPC, the multi-strategy of label propagation is proposed. This strategy propagates the labels according to neighbors of the node. It is worth pointing out that the proposed method (DCN) does not need to adjust the parameters for different networks. Experimental results on both synthetic and real-world networks demonstrate the power of DCN over the comparing community detection algorithms.

Keywords: Community detection Density peak Community center Chebyshev inequality Label propagation strategy

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