

## Fuzzy community detection model in social networks

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### Abstract

In this paper, a fuzzy graph clustering model is presented to identify overlapping communities in a complex network. A center-based fuzzy clustering model is developed based on the possibilistic c-means clustering model, and the distance measure is defined based on the similarity to the clusters' centers. The performance of the clustering process is evaluated by intra and intercluster density. In addition, experimental results from two artificially generated networks and two realworld networks (social interactions between karate club members and a part of the twitter network) indicate the new model's performance.

**Keywords:** Clustering algorithms, Complex networks, Fuzzy sets, Clustering process, Community detection, Fuzzy clustering modeling, Overlapping communities, Possibilistic c-means clustering, Real-world networks, Social interactions, Twitter networks, Cluster analysis.