

# Learning distributed representations for community search using node embedding

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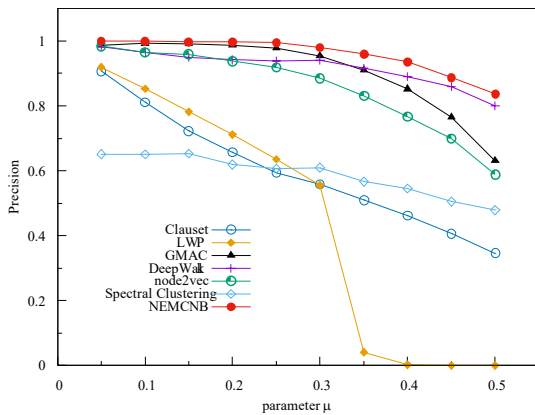
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# Problems & Ideas

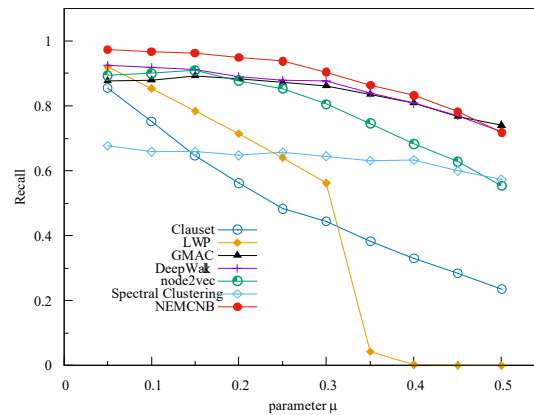
- Problems of community search
  - Given a network  $G$  and a query node  $v$  which is already known to be in the target community, and the goal is to uncover the remaining nodes in the community.
- Ideas: introduce node embedding technique into community search, and propose a new perspective to address community search problem by utilizing node embedding techniques
  - Node embedding techniques which learn low-dimensional representations of nodes from network structure offer an alternative to traditional hand-engineered feature engineering.
  - We build a new Node Embedding Model based on Closest-Neighbor Biased random walk (NEMCNB for short) .
  - NEMCNB provides a new similarity measure between nodes in the network. Based on this, we give out a novel community search algorithm.

# Main Contributions

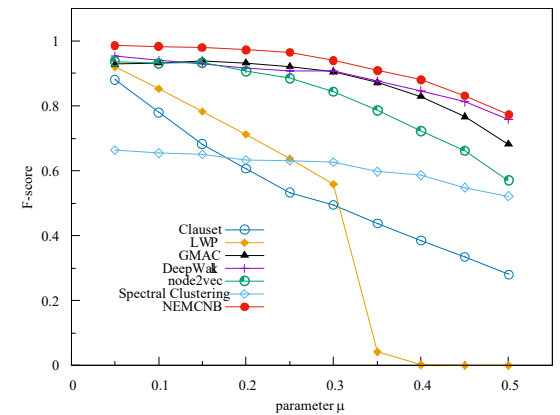
- **NEMCNB performs better than the related community search algorithms on LFR benchmark networks and real-world networks.**



(a) Comparison result of precision

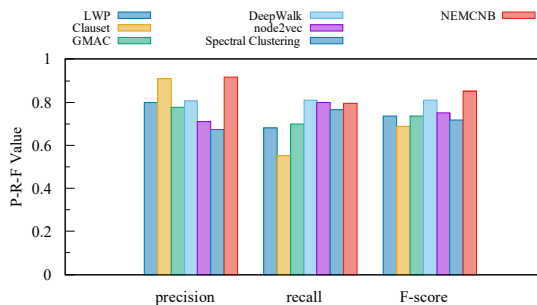


(b) Comparison result of recall

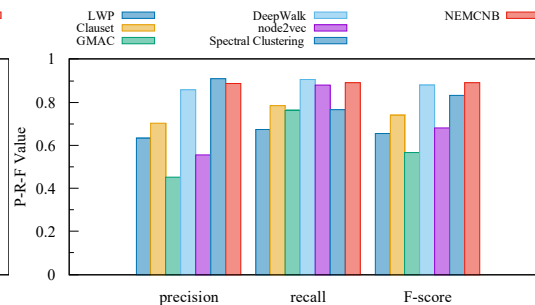


(c) Comparison result of F-score

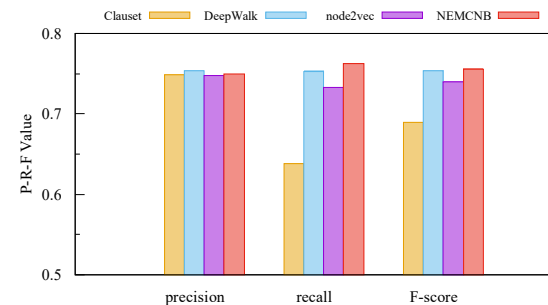
**Fig. 1: Comparison results on LFR benchmark networks**



(a) Comparison result on Karate



(b) Comparison result on Football



(c) Comparison result on DBLP

**Fig. 2: Comparison results on real-world networks**