A Biased Edge Enhancement Method for Truss-based Community Search

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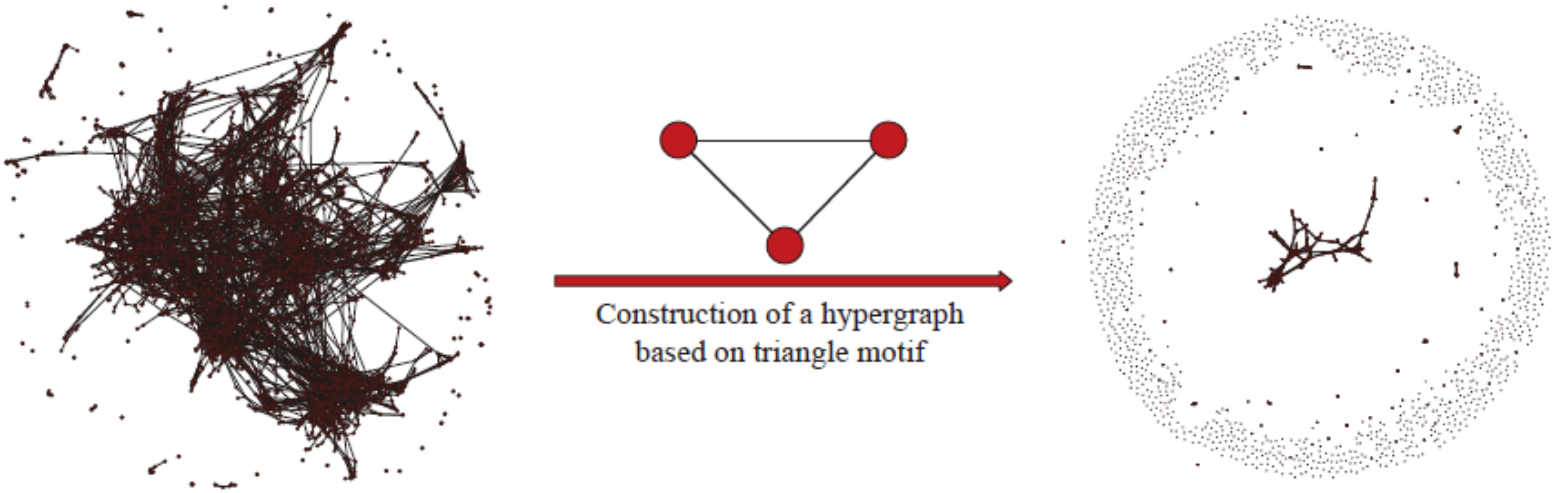
Problems & Ideas

- Problems of conventional community query approaches:
  - Existing methods mainly perform community queries from a single node or edge, ignoring high-order structural information.
  - Existing community query methods based on high-order structures usually suffer from serious fragmentation problems.
- Ideas: We propose a biased edge enhancement method to preserve and enhance the higher-order connectivity in hypergraphs with the fragmentation issue.



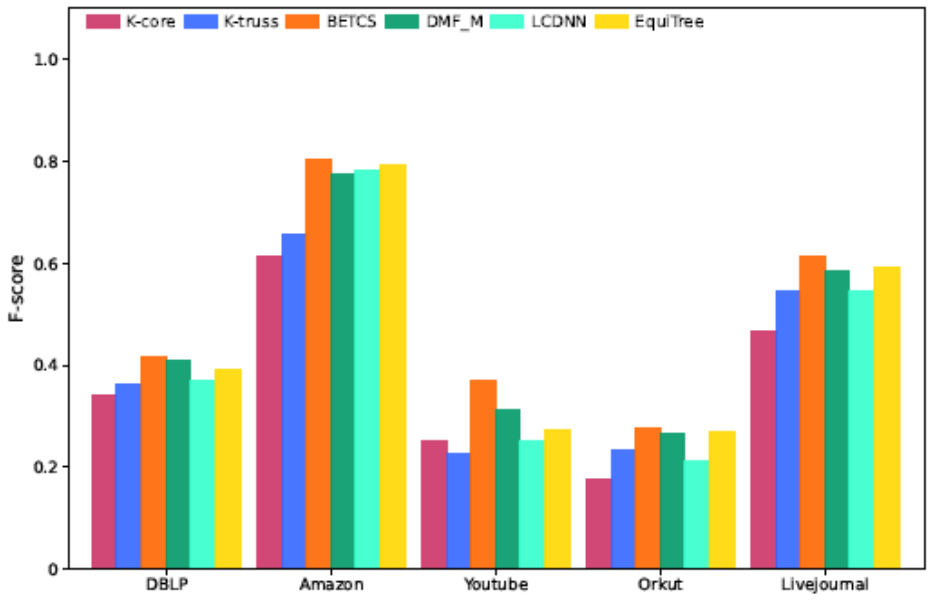
(a) The original Cora network

(b) The corresponding hypergraph

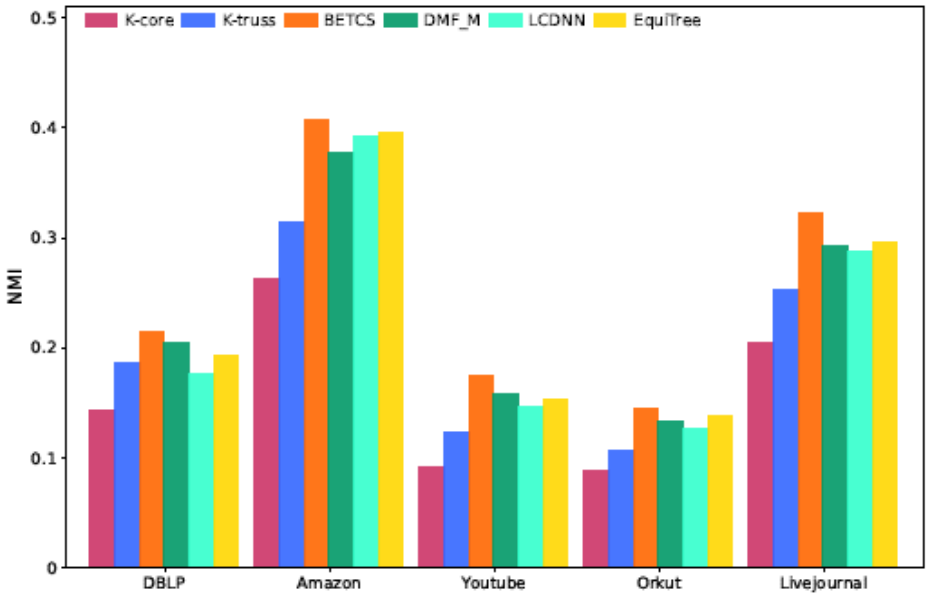
Illustration of the fragmentation issue on the Cora network: The truss-based hypergraph constructed from the original graph is fragmented into numerous subgraphs and isolated nodes.

Main Contributions

- Contributions:
  - We propose a biased edge enhancement method to preserve and enhance the higher-order connectivity in hypergraphs with the fragmentation issue;
  - We propose an edge-enhanced k-truss community search algorithm to address the truss-based hypergraph fragmentation issue;



(a) F-score vs Networks



(b) NMI vs Networks

Accuracy of six algorithms on large-scale networks in terms of Average F-score and NMI.