

# Community Detection with LabelRank

Jierui Xie, Boleslaw K. Szymanski  
(Last updated Apr. 30, 2013)

Thank you for using our **LabelRank** algorithm (aka **GANXiS-S**). LabelRank can be used for **disjoint** community detection. Currently, we only support **un-weighted undirected networks**. Should you have any questions or comments, please send emails to [jierui.xie@gmail.com](mailto:jierui.xie@gmail.com) or [szymansk@rpi.edu](mailto:szymansk@rpi.edu).

For more information about this algorithm, please refer to our paper [1].

**Download:** <https://sites.google.com/site/communitydetectionslpa/>

## 1 Compile

This is a C++ version.

To compile on Linux/Unix platforms (need g++):

**make**

To run:

**./LabelRank netName cutoff(r) inflation(in) NBDisimilarity(q)**

e.g., **./LabelRank test.ipairs 0.1 2 0.6**

For help:

**./LabelRank**

## 2 Input format for undirected networks

LabelRank accepts a file containing a list of edges. Each row represents an edge. It is of the form (node1 node2), meaning there is an edge from node1 to node2. The name (or ID) for a node is an integer. The algorithm will automatically make edges symmetric to produce undirected networks. That is, if there is an edge (i j), there will be a corresponding edge (j i). See test.ipairs for examples.

NOTE: it is fine to provide a weight, e.g., (i j weight). Since we currently not support weighted networks, weights will be ignored.

### 3 Output format

Detection results are put in the [output](#) directory. Each file ([.icpm](#)) is a cover/partitioning. Each line contains nodes in a community.

### 4 Copyright and Disclaimer Notice

COPYRIGHT 2013 Jierui Xie and Boleslaw K. Szymanski and Rensselaer Polytechnic Institute. All worldwide rights reserved including pending patent rights. A license to use this software for non-commercial research purposes only is hereby granted, provided that this copyright notice and accompanying disclaimer is not modified or removed from the software. Copy, modification and distribution are not allowed without the written permission of the owners.

DISCLAIMER: The software is distributed *AS IS* without any express or implied warranty, including but not limited to, any implied warranties of merchantability or fitness for a particular purpose or any warranty of non-infringement of any current or pending patent rights. The authors of the software make no representations about the suitability of this software for any particular purpose. The entire risk as to the quality and performance of the software is with the user. Should the software prove defective, the user assumes the cost of all necessary servicing, repair or correction. In particular, neither Rensselaer Polytechnic Institute, nor the authors of the software are liable for any indirect, special, consequential, or incidental damages related to the software, to the maximum extent the law permits.

### 5 References

- [1] Jierui Xie, Boleslaw K. Szymanski and Xiaoming Liu, *LabelRank: A Stabilized Label Propagation Algorithm for Community Detection in Networks*, IEEE NSW, West point, NY, 2013.