

# Extract Reference Co-Occurrence (Bibliographic Coupling) Network



This page appears to describe an older version of the Bibliographic Coupling algorithm. Some details may differ from the version that is currently available.

## Description

Extracts a bibliographic coupling network from a network.

## Pros & Cons

Can return sensible similarity networks based on citation, but may not make sense for other kinds of networks.

## Applications

Extracting similarity between nodes. Good for then feeding into force directed algorithms, especially DrL.

## Implementation Details

The algorithm in Network Workbench will take in a directed, undirected, or hypergraph network. The undirected edges will be transformed into two directed edges. All edge weights are ignored. A new network is returned with the same nodes (and their attributes) with weighted undirected edges where each edge corresponds to a single similarity score (ranging from 0.0 to 1.0) between two nodes. The similarity score uses the following formula:  $\text{similarity} = \frac{\text{sharedCitations}}{\sqrt{\text{citationCount1} * \text{citationCount2}}}$  where sharedCitations is the number of citations which they both cite, citationCount1 is the total number of citations the first node cited, and citationCount2 is the total number of citations the second node cited. This algorithm takes a single parameter, which states the maximum number of top bibliographic coupling scores to keep. If 0 is specified, then every possible bibliographic coupling score will be kept.

## Usage Hints

Any network can be given to this algorithm, though it makes most sense on directed networks, especially citation networks.

## Acknowledgments

Todd Holloway implemented the first version in Perl. Bruce Herr later reimplemented the algorithm in C++ for scalability and speed. The C++ version is in Network Workbench.

## References

Garfield, E. "From Bibliographic Coupling to Co-Citation Analysis via Algorithmic Historio-Bibliography"

## Links

- [Source Code](#)

\* See Also\*



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