Algorithms

[Algorithms organized by function] [Data Preparation] [Database] [ISI] [NSF] [General] [Generic-CSV] [Preprocessing] [General] [Temporal] [Geospatial] [Topical] [Networks] [Analysis] [Temporal] [Geospatial] [Topical] [Networks] [Unweighted & Undirected] [Weighted & Undirected] [Unweighted & Directed] [Weighted & Directed] [Search] [Discrete Network Dynamics] [Modeling] [Networks] [Visualization] [General] [Temporal] [Geospatial] [Networks] [Simulation] [Single-Population] [Network] [R] [Scientometrics] [Readers] [Facebook Reader] [Flickr Reader] [Google Citation Reader] [Twitter Reader] [XML to CSV Converter] [Algorithms organized alphabetically]

Below is a list of the algorithms created so far from each CNS CIShell-powered tool. There are two lists, one organizes the algorithms by their function in the tools and the other organizes the algorithms alphabetically. Some pages are currently somewhat sparse, as of March 2011.

If you would like to view an index of algorithms in a particular CNS CIShell-powered tool, see the Sci2 Algorithm Index, the NWB Manual, or the EpiC Manual.

Source code for these algorithms is browsable in the CNS Center repository, see Document & Developer Resources (direct link to repository is currently down. Should be available soon as of March 2011).

Algorithms organized by function

Data Preparation

- Remove ISI Duplicate Records
- Remove Rows with Multitudinous Fields
- Extract Directed Network
- Extract Bipartite Network
- Extract Paper Citation Network
- Extract Author Paper Network
- Extract Co-Occurrence Network
- Extract Word Co-Occurrence Network
- Extract Co-Author Network
- Extract Reference Co-Occurrence (Bibliographic Coupling) Network
- Extract Document Co-Citation Network
- Detect Duplicate Nodes
- Update Network by Merging Nodes
- Convert to Generic Publication

Database

ISI

- Merge Identical ISI People
- Suggest ISI People Merges
- Merge Document Sources
- Match References to Papers
- Extract Authors
- Extract Documents
- Extract Keywords
- Extract Document Sources
- Extract Authors by Year
- Extract References by Year
- Extract Original Author Keywords by Year
- Extract New ISI Keywords by Year
- Extract Authors by Year for Burst Detection
- Extract Documents by Year for Burst Detection
- Extract Original Author Keywords by Year for Burst Detection
- Extract New ISI Keywords by Year for Burst Detection
- Extract References by Year for Burst Detection
- Extract Longitudinal Summary
- Extract Co-Author Network
- Extract Author Citation Network
- Extract Document Citation Network (Core Only)
- Extract Document Citation Network (Core and References)
- Extract Document Source Citation Network (Core Only)
- Extract Document Source Citation Network (Core and References)
- Extract Document Co-Citation Network (Core Only)
- Extract Document Co-Citation Network (Core and References)
- Extract Document Source Co-Citation Network (Core Only)
- Extract Document Source Co-Citation Network (Core and References)
- Extract Author Co-Citation Network
- Extract Author Bibliographic Coupling Network
- Extract Document Bibliographic Coupling Network
- Extract Document Source Bibliographic Coupling Network
- Extract Weighted Document-Document Network

NSF

- Merge Identical NSF People
- Extract Investigators
- Extract Awards
- Extract Organizations
- Extract Co-PI Network

General

- Create Merging Table
- Merge Entities
- Custom Table Query
- Custom Graph Query
- Extract Raw Tables from Database

Generic-CSV

- Extract Co-Occurrence Network
- Extract Bipartite Network
- Extract Co-Entity Occurrence Network
- Extract Table

Preprocessing

General

- Extract Top N% Records
- Extract Top N Records
- Aggregate Data

Temporal

- Slice Table by Time

Geospatial

- Extract ZIP Code

Topical

- Lowercase, Tokenize, Stem, and Stopword Text
- Reconcile Journal Names

Networks

- Extract Timestep
- Extract Top Nodes
- Extract Nodes Above or Below Value
- Remove Node Attributes
- Delete High Degree Nodes
- Delete Random Nodes
- Delete Isolates
- Extract Top Edges
- Extract Edges Above or Below Value
- Remove Edge Attributes
- Remove Self Loops
- Trim by Degree
- Snowball Sampling (N nodes)
- MST-Pathfinder Network Scaling
- Fast Pathfinder Network Scaling
- Pathfinder Network Scaling
- Node Sampling
- Edge Sampling
- Symmetrize
- Dichotomize
- Multipartite Joining
- Slice Table by Time
- Merge 2 Networks

Analysis

Temporal

- Burst Detection

Geospatial

- Geocoder
- Congressional District Geocoder
- Yahoo! Geocoder
- Bing Geocoder

Topical

- Burst Detection

Networks

- Network Analysis Toolkit (NAT)

Unweighted & Undirected

- Node Degree
- Degree Distribution
- K-Nearest Neighbor (Java)
- Watts-Strogatz Clustering Coefficient
- Watts Strogatz Clustering Coefficient over K
- Diameter
- Average Shortest Path
- Shortest Path Distribution
- Node Betweenness Centrality
- Weak Component Clustering
- Global Connected Components
- Extract K-Core
- Annotate K-Coreness
- Blondel Community Detection
- HITS

Weighted & Undirected

- Clustering Coefficient
- Nearest Neighbor Degree
- Strength vs Degree
- Degree & Strength
- Average Weight vs End-point Degree
- K-Nearest Neighbor (Java)
- Strength Distribution
- Weight Distribution
- Randomize Weights
- PageRank
- Node Betweenness Centrality
- Blondel Community Detection
- HITS
- MST-Pathfinder Network Scaling
- Fast Pathfinder Network Scaling

Unweighted & Directed

- Node Indegree
- Node Outdegree
- Indegree Distribution
- Outdegree Distribution
- K-Nearest Neighbor
- Single Node In-Out Degree Correlations
- Dyad Reciprocity
- Arc Reciprocity
- Adjacency Transitivity
- Node Betweenness Centrality
- Weak Component Clustering
- Strong Component Clustering
- Extract K-Core
- Annotate K-Coreness
- HITS
- PageRank

Weighted & Directed

- HITS
- PageRank
- Fast Pathfinder Network Scaling
- Blondel Community Detection

Search

- Can
- Chord
- K Random-Walk
- Random Breadth First

Discrete Network Dynamics

- Extract and Annotate Attractors

Modeling

Networks

- Random Graph
- Watts-Strogatz Small World
- Barabási-Albert Scale-Free
- Can
- Chord
- Hypergrid
- PRU
- TARL (Topics, Aging and Recursive Linking)
- Discrete Network Dynamics (DND)
- Evolving Network (Weighted)

Visualization

General

- GnuPlot

Temporal

- Horizontal Bar Graph
- Horizontal Bar Graph (not included version)
- Temporal Bar Graph

Geospatial

- Proportional Symbol Map
- Choropleth Map

Networks

- GUESS
- Gephi
- GnuPlot
- Radial Tree/Graph (prefuse alpha)
- Radial Tree/Graph with Annotations (prefuse beta)
- Tree View (prefuse beta)
- Tree Map (prefuse beta)
- Balloon Graph (prefuse beta)
- Force Directed with Annotation (prefuse beta)
- Kamanda-Kawai (JUNG)
- Fruchterman-Reingold (JUNG)
- Fruchterman-Reingold with Annotation (prefuse beta)
- Spring (JUNG)
- Small World (prefuse alpha)
- Parallel Coordinates (demo)
- LaNet
- DrL(VxOrd)
- Specified (Prefuse beta)
- Circular Hierarchy
- Circular (JUNG)
- Bipartite Network Graph

Simulation

Single-Population

- Stochastic
- Exact

Network

- Stochastic
- Bipartite Network Graph

R

- Create an R Instance
- Run Rgui
- Send a Table to R
- Get a Table from R

Scientometrics

- Remove ISI Duplicate Records
- Remove Rows with Multitudinous Fields
- Detect Duplicate Nodes
- Update Network by Merging Nodes
- Extract Directed Network
- Extract Paper Citation Network
- Extract Author Paper Network
- Extract Co-Occurrence Network
- Extract Word Co-Occurrence Network
- Extract Co-Author Network
- Extract Reference Co-Occurrence (Bibliographic Coupling) Network
- Extract Document Co-Citation Network

Readers

Facebook Reader

- Facebook Access Token
- Facebook Friends Data
- Facebook Mutual Friends

Flickr Reader

- Flickr Reader Algorithm

Google Citation Reader

- Google Citation User ID Search Algorithm
- Attach Citation Indices from Google Scholar
- Attach Citation Table from Google Scholar

Twitter Reader

- Twitter Reader Algorithm

XML to CSV Converter

- XML to CSV Converter Algorithm

Algorithms organized alphabetically

- Adjacency Transitivity
- Aggregate Data
- Annotate K-Coreness
- Annotate K-Coreness (Unweighted & Directed)
- Arc Reciprocity
- Attach Citation Indices from Google Scholar
- Attach Citation Table from Google Scholar
- Average Shortest Path
- Average Weight vs End-point Degree
- Barabási-Albert Scale-Free
- Bing Geocoder
- Bipartite Network Graph
- Blondel Community Detection
- Burst Detection
- Can
- Chord

- Circular Hierarchy
- Clustering Coefficient
- Congressional District Geocoder
- Convert to Generic Publication
- Create an R Instance
- Create Document Source Merging Table
- Create Merging Table
- Custom Graph Query
- Custom Table Query
- Degree & Strength
- Degree Distribution
- Delete Isolates
- Detect Duplicate Nodes
- Diameter
- Dichotomize
- DrL (VxOrd)
- Dyad Reciprocity
- Edge Sampling
- Extract Author Bibliographic Coupling Network
- Extract Author Citation Network
- Extract Author Co-Citation Network
- Extract Author Paper Network
- Extract Authors
- Extract Authors by Year
- Extract Authors by Year for Burst Detection
- Extract Awards
- Extract Bipartite Network
- Extract Co-Author Network
- Extract Co-Author Network (Text Files)
- Extract Co-Occurrence Network
- Extract Co-PI Network
- Extract Directed Network
- Extract Document Bibliographic Coupling Network
- Extract Document Citation Network (Core and References)
- Extract Document Citation Network (Core Only)
- Extract Document Co-Citation Network
- Extract Document Co-Citation Network (Core and References)
- Extract Document Co-Citation Network (Core Only)
- Extract Documents
- Extract Documents by Year for Burst Detection
- Extract Document Source Bibliographic Coupling Network
- Extract Document Source Citation Network (Core and References)
- Extract Document Source Citation Network (Core Only)
- Extract Document Source Co-Citation Network (Core and References)
- Extract Document Source Co-Citation Network (Core Only)
- Extract Document Sources
- Extract Edges Above or Below Value
- Extract Investigators
- Extract K-Core
- Extract K-Core (Unweighted & Directed)
- Extract Keywords
- Extract Longitudinal Summary
- Extract New ISI Keywords by Year
- Extract New ISI Keywords by Year for Burst Detection
- Extract Nodes Above or Below Value
- Extract Organizations
- Extract Original Author Keywords by Year
- Extract Original Author Keywords by Year for Burst Detection
- Extract Paper Citation Network
- Extract Raw Tables from Database
- Extract Reference Co-Occurrence (Bibliographic Coupling) Network
- Extract References by Year
- Extract References by Year for Burst Detection
- Extract Top Edges
- Extract Top N% Records
- Extract Top Nodes
- Extract Top N Records
- Extract Weighted Document-Document Network
- Extract Word Co-Occurrence Network
- Extract ZIP Code
- Facebook Access Token
- Facebook Mutual Friends
- Fast Pathfinder Network Scaling
- Flickr Reader
- Force Directed with Annotation (prefuse beta)
- Fruchterman-Reingold with Annotation (prefuse beta)
- Geocoder
- Geospatial Visualization
- Gephi

- Get a Table from R
- Global Connected Components
- Google Citation User ID Search Algorithm
- GUESS
- HITS
- Horizontal Bar Graph
- Horizontal Bar Graph (not included version)
- Hypergrid
- Indegree Distribution
- K-Nearest Neighbor
- K-Nearest Neighbor (Java)
- Load Existing Database
- Load ISI File Into Database
- Load ISI File with 'ISI flat format'
- Load NSF File Into Database
- Louvain Multilevel Refinement Community Detection
- Lowercase, Tokenize, Stem, and Stopword Text
- Map of Science via 554 Fields
- Map of Science via Journals
- Match References to Papers
- Merge 2 Networks
- Merge Document Sources
- Merge Entities
- Merge Identical ISI People
- Merge Identical NSF People
- MST-Pathfinder Network Scaling
- Multipartite Joining
- Nearest Neighbor Degree
- Network Analysis Toolkit (NAT)
- Node Betweenness Centrality
- Node Degree
- Node Indegree
- Node Outdegree
- Node Sampling
- Outdegree Distribution
- PageRank
- Pathfinder Network Scaling
- PRU
- Radial Tree or Graph (prefuse alpha)
- Radial Tree or Graph with Annotations (prefuse beta)
- Random Graph
- Randomize Weights
- Read citation indices for a given set of authors
- Reconcile Journal Names
- Remove Edge Attributes
- Remove ISI Duplicate Records
- Remove Node Attributes
- Remove Rows with Multitudinous Fields
- Remove Self Loops
- Run Rgui
- Send a Table to R
- Shortest Path Distribution
- Single Node In-Out Degree Correlations
- Louvain Community Detection
- Slice Table by Time
- SLM Community Detection
- Snowball Sampling (N nodes)
- Specified (Prefuse beta)
- Strength Distribution
- Strength vs Degree
- Strong Component Clustering
- Suggest ISI People Merges
- Symmetrize
- TARL (Topics, Aging and Recursive Linking)
- Temporal Bar Graph
- Tree Map (prefuse beta)
- Tree View (prefuse beta)
- Trim by Degree
- Twitter Reader
- Update Network by Merging Nodes
- Watts-Strogatz Clustering Coefficient
- Watts Strogatz Clustering Coefficient over K
- Watts-Strogatz Small World
- Weak Component Clustering
- Weight Distribution
- Workflow Module
- Workflow Tracker
- XML to CSV Algorithm
- Yahoo! Geocoder