

Qualitative Analysis: Hypergraph packages

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1 Bioconductor: Hypergraph

Location:

<http://bioconductor.org/packages/release/bioc/html/hypergraph.html>

Restriction Description	Pro	Con
Programing Language: R	Configured for R Packages.	No other languages.
Undirected & Directed	Easy implementation	Non-repeating edges.
List of edges	Easy implementation	$O(N)$ random time.
Direct conversion to/from graph	Sparse matrix list	No generated support
Static/Non-generated	Fast access	Must fit in main memory
Odometer Support: None.	N/A	N/A
Infinite/Generated Hypergraph: None.	N/A	N/A
Iterative Functions: None.	N/A	N/A
Rounded Space Mapping: None.	N/A	N/A

The Bioconductor Hypergraph software package provides a Hypergraph template package that allows for simple standard graphs to be converted to hypergraph structures. The implementation uses a fixed list of hyperedge to construct the hypergraph. The size of the hypergraph is restricted to sizes that can fit in main memory. There is no support for generated / enumerated / projected hypergraphs.

This software package introduces a lightweight template that needs to be customized to the specific application. There are no standard algorithms provided or enumeration techniques built into the interface.

2 PaToHs: Hypergraph Partitioner

Restriction Description	Pro	Con
Programming Language: C/C++ & Matlab	Lightweight C	Tiny Library
Graphs that need Cutting.	Highly optimized partitioner	One problem only.
Array of Nodes & Edges	Pure Functional	No support functions
Hypergraph File Format	Read / Write routines provided	Arbitrary file format
Integer Weights	Specilized partitioning	No generic algorithms.
Odometer Support: “Pins”	User Managed	Parameters to functions
Infinite/Generate Hypergraph: None	N/A	N/A
Iterative Functions: Callbacks	Only Cut function	N/A
Rounded Space Mapping: None	N/A	N/A

3 Zoltan: Hypergraph Partitioner

Restriction Description	Pro	Con
Programming Language: C++11 Graphs that need Cutting. Vector of Nodes & Edges Specialized Graph Adapter Weight for edge cut	Support Team Highly optimized partitioner Tilinos Integration Easy partitioning mapping Specilized for partitioning	Larger code base One problem only. Non-std-template based. No generic hypergraph. No generic algorithms.
Odometer Support: Primitive Infinite/Generate Hypergraph: None Iterative Functions: Callbacks Rounded Space Mapping: None	Internal Maps Observed N/A Greedy Algorithms for NP N/A	No external access. N/A Only Weighted solutions. N/A