Orthologous pairs between species

Co-association network of species A

Co-association network of species B

Extendable to more species

Input

Set initial temperature $T(0)$

randomly assign labels $(1,2,\ldots,q)$ to nodes

system evolves (labels flip) according to $H$

flipping rate is low?

$T(k+1) = \alpha T(k)$

at most $q$ modules labeled by 1 to $q$

High-confidence modules based on multiple runs

Output

A set of cross-species modules, with different numbers of shared orthologs

conserved module

B-specific module

A-specific module

Potts Clustering

simulated annealing to optimize $H$