

STAT 6560
Graphical Methods
Spring Semester 2009
Project 2

Brittany Allred

Utah State University

Department of Mathematics and Statistics

3900 Old Main Hill

Logan, UT 84322-3900

R packages *diagram* and *igraph*

Applications of the Packages

- Visual display of flow charts
- Food Chains
- Gene relationships - Bioinformatics
 - dendrograms, forests, etc.
- Social Networking
 - Wikipedia defines a social network as ”... a social structure made of nodes (which are generally individuals or organizations) that are tied by one or more specific types of interdependency, such as values, visions, ideas, financial exchange, friendship, sexual relationships, kinship, dislike, conflict or trade.”
http://en.wikipedia.org/wiki/Social_network

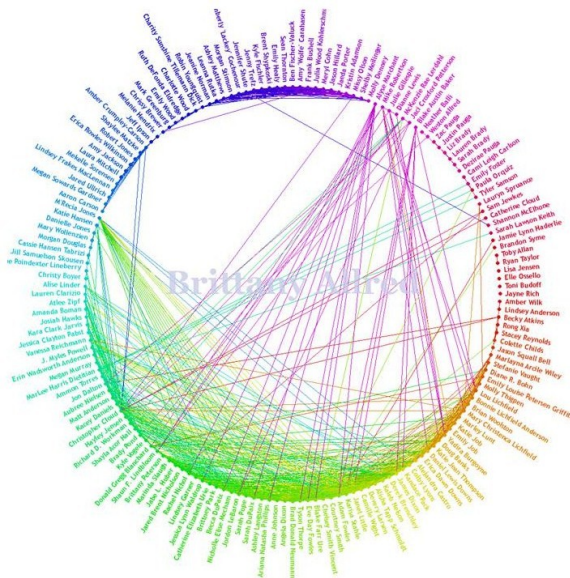


Figure 1: Facebook's Friend Circle, <http://apps.facebook.com/friendwheel/>

diagram

Main documentation: <http://cran.r-project.org/web/packages/diagram/vignettes/diagram.pdf>

- plotmat

- “takes as input a [square] matrix with transition coefficients or interaction strengths. It plots the corresponding network consisting of (labeled) boxes (the components) connected by arrows. Each arrow is labeled with the value of the [coefficients].”

- plotweb

- “function plotweb takes as input a [square] matrix with (flow) values, and plots a web. Here the components are connected by arrows whose thickness is determined by the value of the coefficients.”

- Examples:

http://www.math.usu.edu/~symanzik/teaching/2009_stat6560/RDataAndScripts/allred_brittany_project2_rcode_diagram.R

http://www.math.usu.edu/~symanzik/teaching/2009_stat6560/RDataAndScripts/allred_brittany_project2_rcode_Netherlands.R

igraph

A little graph theory from Wikipedia ([http://en.wikipedia.org/wiki/Graph_\(mathematics\)](http://en.wikipedia.org/wiki/Graph_(mathematics)))

- Graph are made up of nodes and edges. Edges connect the nodes.
- Graphs can be directed (with arrows), undirected (without arrows), or both.

<http://igraph.sourceforge.net/> Provides extensive examples of the many features of *igraph*.

- *igraph* can be used with small graphs
- Plotting Functions:

- *plot.igraph* - Plots the basic matrix
- *tkplot* - Interactive plotting function allows the user to change the shape of the graph.
- *rglplot* - 3D plot allows rotation of the figure for further examination.

- Example:

http://www.math.usu.edu/~symanzik/teaching/2009_stat6560/RDataAndScripts/allred_brittany_project2_rcode_igraph.R