Introduction to network mapping
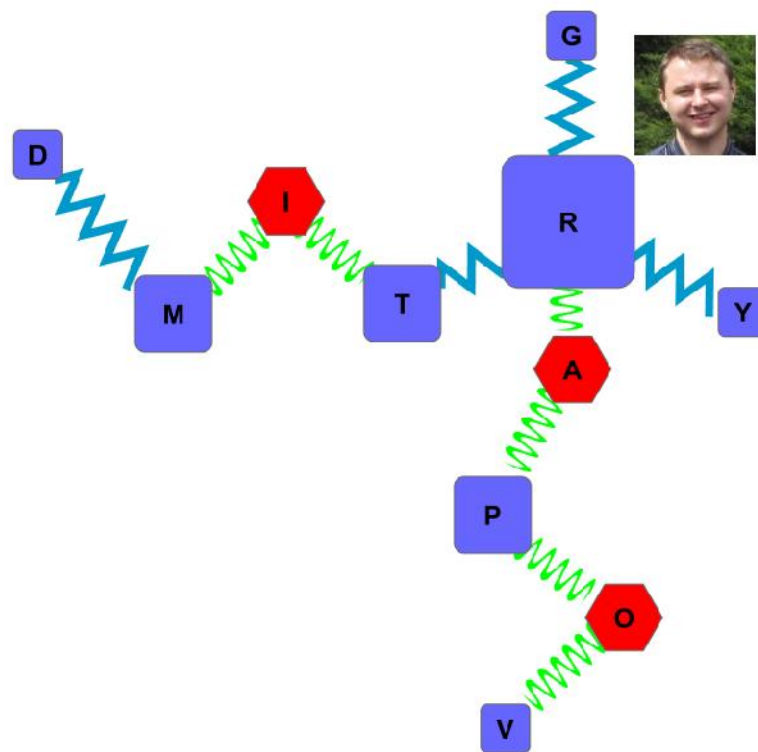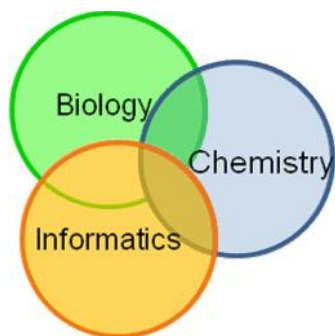
Goal: Generate a mapped "name" network

Topics:
1. Edge list
2. Node attributes
3. Network Mapping
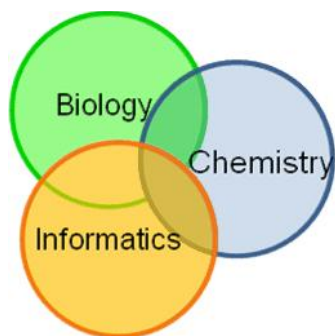4. Cytoscape

Network Mapping

Network Mapping

Steps:

1. Make Edge list
2. Make Node attributes
3. Generate Network
4. Map node attributes
5. Final touches
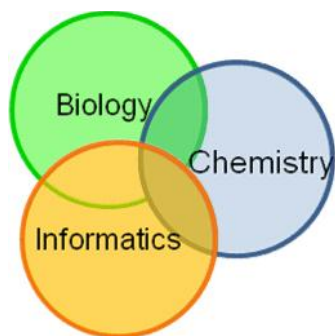
See Items in "Network" folder for results

Edge List

Minimum Requirements:

- 2 column matrix with source (start) and target (end) nodes (e.g. letters)
- extra columns can be used to set edge (connection) aesthetics (e.g. width, color, etc.)
- See file "name edge list.xlsx" for an example edge list defining how the letters in my name (Dmitry Grapov) are connected with an extra column identifying consonants

	A	B	C	D
1	source	target	consonant cluster	
2	D	M	1	
3	M	I	0	
4	I	T	0	
5	T	R	1	
6	R	Y	1	
7	G	R	1	
8	R	A	0	
9	A	P	0	
10	P	O	0	
11	O	V	0	
12				

Node Attributes
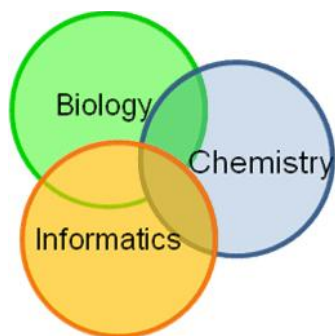
Minimum Requirements:
- ID for nodes (rows) must match the edge ID
- Extra columns can be used to set each nodes properties (e.g. color, size, image, etc.)
- See file "node attributes.xlsx" for an example node attributes file

	A	B	C	D	E	F
1	ID	color	size	node image		
2	D	1	1			
3	M	1	2			
4	I	0	2			
5	T	1	2			
6	R	1	4	http://m.c.lnkd.licdn.com/mpr/pub/ir		
7	Y	1	1			
8	G	1	1			
9	A	0	2			
10	P	1	2			
11	O	0	2			
12	V	1	1			
13						
14						

Network Generation

Use Cytoscape to generate network (v2.83)
(http://www.cytoscape.org/)
•Import Edge list (this can be many forms)
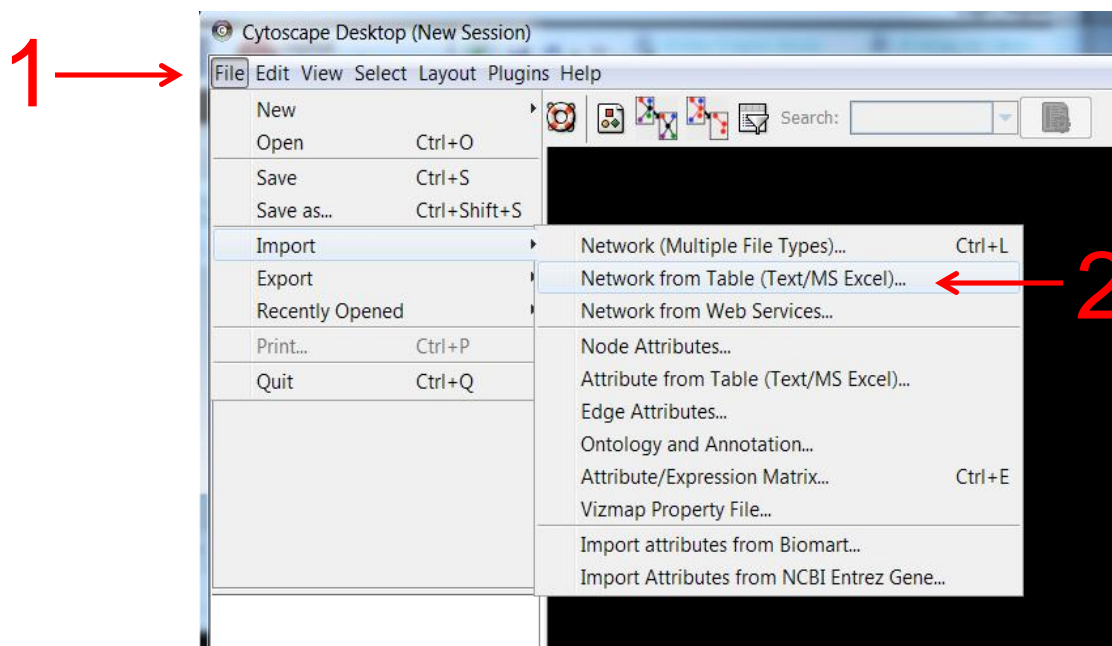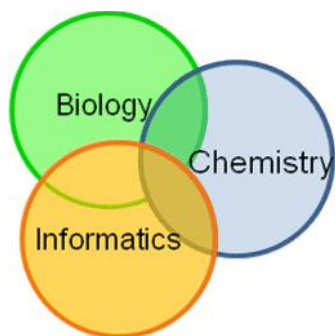
Network Generation (cont.)

1. Select file for edge list
2. Identify columns for edge (connection) source and target.
Double click column to enable edge attributes.
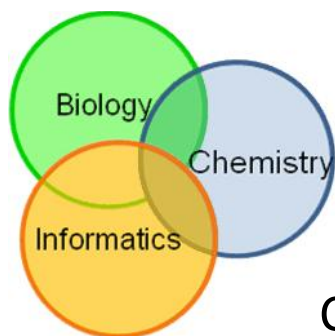Hint: Show Text File Import Options>>Transfer first line.....

Network Mapping

Node Layout

Cytoscape provides many options to help auto-optimize the node (letters) layout

2 (3 default add-ins)

3
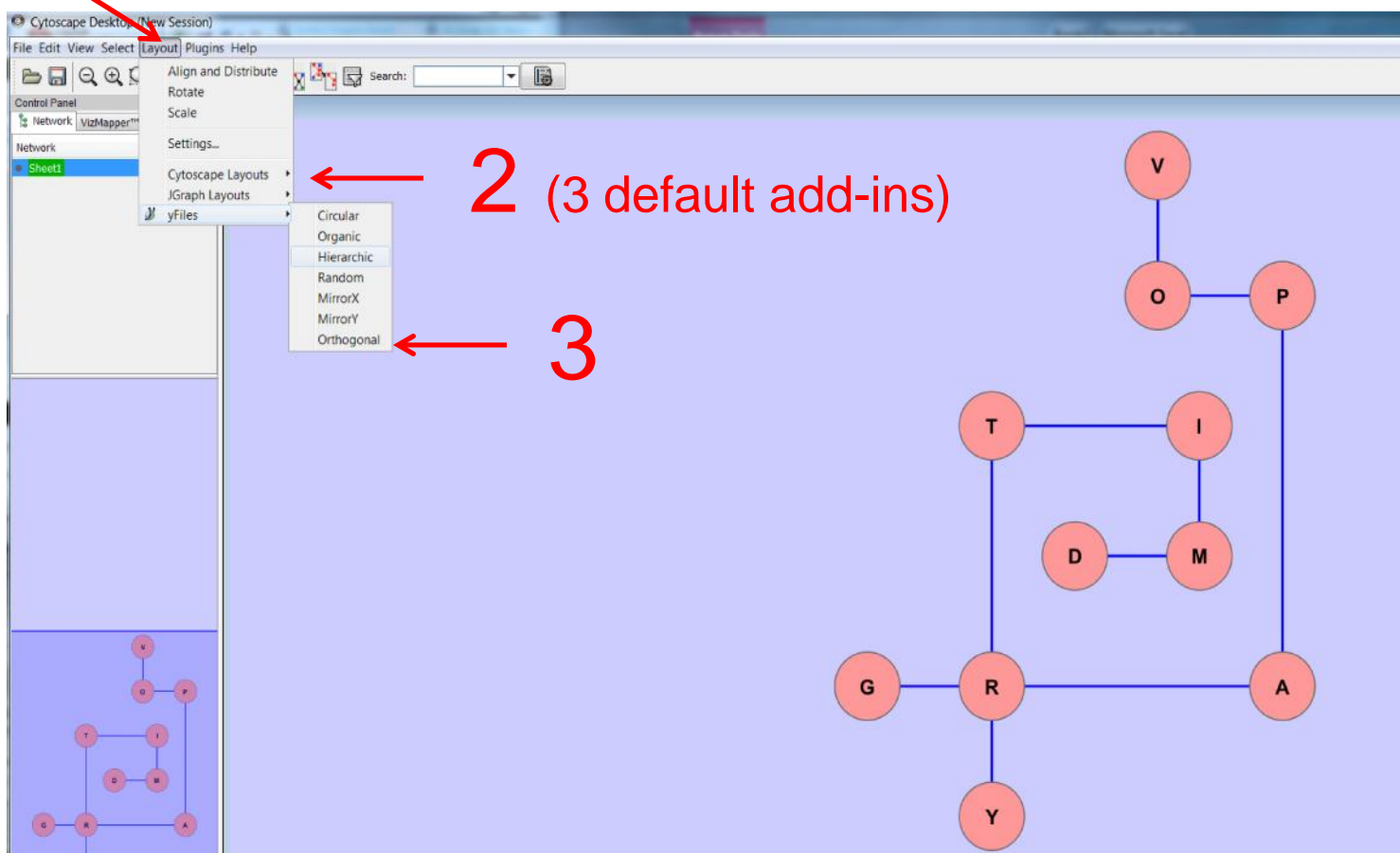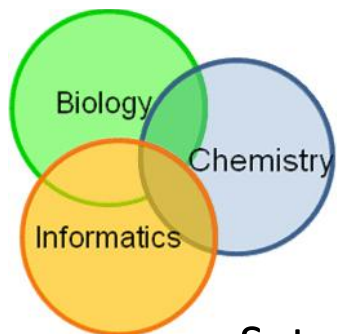
Global Defaults

Set defaults to modify global node, edge and other options.
Double-click on Defaults image

Network Mapping

Modify Edge Attributes

Use the VizMapper to map "extra columns" in edge list (attributes) to aesthetics.

Node Attributes

Select file for the node attributes. Extra options can be used to select node ID (must match edge list), change the file delimiter, etc.
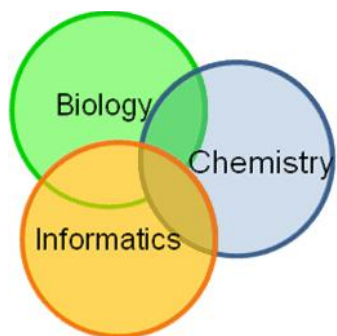
Modify Node Attributes

Use the VizMapper to map node attributes.

Network Mapping

Add node images

New columns can be added to the node attributes and change the mapping in existing networks. Here I'll add a url for a .png to use as a custom node image. Custom images can also be defined as local file path (e.g. windows: file:///C:\.....)
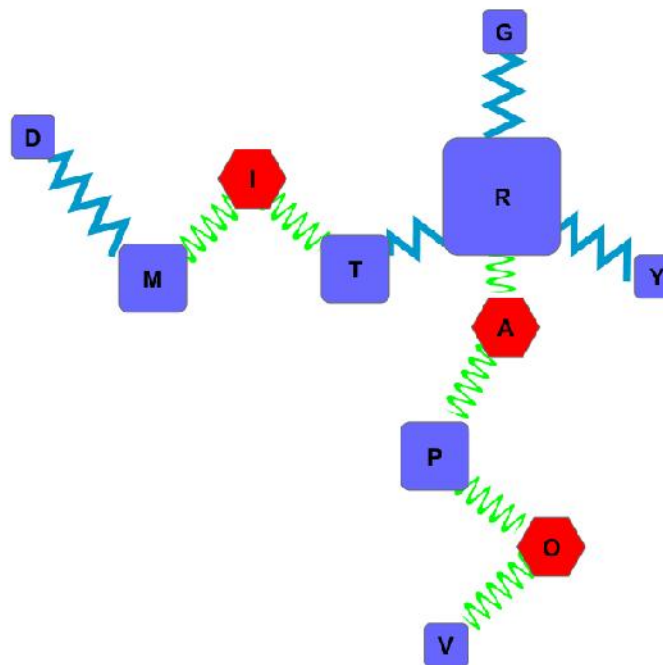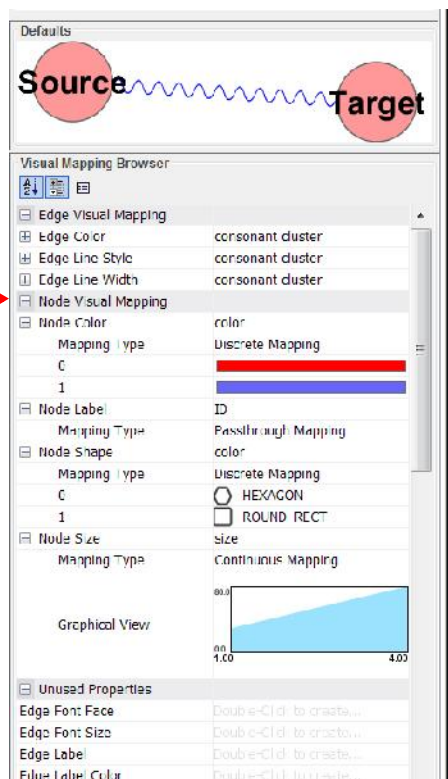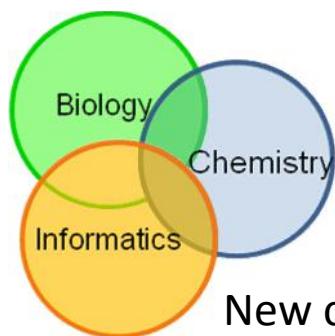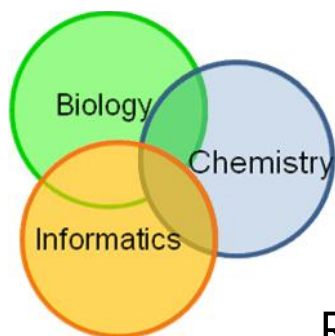
Linked in.

Dmitry Grapov
Principal Statistician at UC Davis, NIH West Coast

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Print...

Inspect element

...ento, California Area) | Research

...IC Davis
...Common Fund in Metabolomics

...H West Coast Metabolomics Center at
...Davis

...ics at USDA-ARS-WHNRC Nutritional
Metabolomics Research Group
Ph.D., Agricultural and Environmental Chemistry with Emphasis in Biotechnology at UC Davis
NIH Fellow in Biotechnology at University of California Davis
see all ▾

Education	University of California, Davis
	UC Davis Graduate School of Management
	University of Utah
Connections	**122** connections
Websites	CV
	Research and Tools
	Hobbies

ID	color	size	node image
D	1	1	
M	1	2	
I	0	2	
T	1	2	
R	1	4	http://m.c.lnkd.licdn.com/mpr,
Y	1	1	
G	1	1	
A	0	2	
P	1	2	
O	0	2	
V	1	1	

Override mapped attributes

Right-click on an edge or node to manually change their aesthetics

Export Network as Image

Export as .pdf or .svg to further modify (and beautify) the network.

Network Mapping
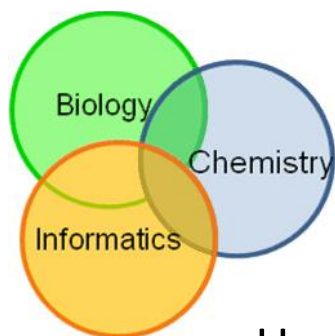
Final Touches

Use irfanview (http://www.irfanview.com/) for minor edits or inkscape (http://www.inkscape.org/en/) for complete control of final touches including making legends.