Network visualization with cytoscape

Lab session on February 13th

Homework review

- Most difficult homework during the semester
  - Undefined: didn’t tell you what is interesting
  - Didn’t tell you how to make good visualization

Data exploration: how to find interesting features

- Show as much of the data as possible
- Try different layouts, visual mappings
- But: consider what you expect before applying
  - Interesting features are the surprising ones

Data visualization: how to show interesting features

- Not the same image you were looking at
- Remove unimportant details
- Should make observation obvious, in the blink of an eye
- Focus attention

Describe visualization – legend

- Need to explain every color, shape, etc.
- A legend is better than long text
- Legend for layout?

Focusing attention

- Zoom / crop
  - Creating sub-networks
- Highlight some parts – vizmap bypass
  - But big caveat
- Add annotation
  - In cytoscape
  - Afterwards, eg. in presentation editor
- Focus on emptiness?

Fine-tuning – checklist

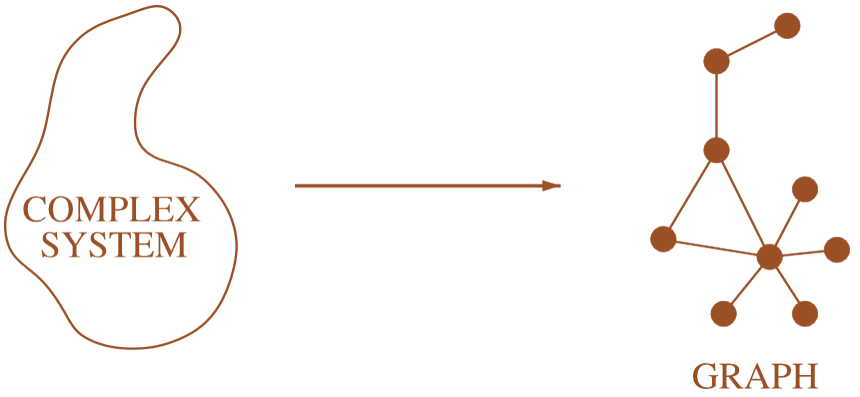
- Check layout – node, node-edge overlaps
  - Hand-tuning layouts vs. visual styles
- Clear selection
- Export legend
- Zoom out
- Export with correct image format

Using visual aspects

- Hierarchy of usefulness:
  - How noticeable they are
  - How useful they are
- Recommended order:
  1) Node color
  2) Node size
  3) Node shape
- Picking colors
  - Gradient vs. categorical
  - Color harmony

Interpreting the observation

- Describing data or the system?
- The available data is
  - Always an abstraction
  - Always partial



➔ Keep an open mind,

offer multiple explanations

A plugin to help: NetworkAnalyzer

- Launching
- Plotting data
- Generating visual style
- Globalness of attributes – network collections
- App manager – other plugins

Accuracy vs. “prettiness”

- Data visualization should be accurate
  - Warnings about vizmap bypass & hand-tuning
- But: full accuracy can be bad, too

➔ Need compromise

Homework assignment

- Create visualization of protein structure dataset
  - Visualize clustering coefficient and closeness
  - (make sure to get the small details right!)
- Ensure you have python 3.x installed
  - matplotlib, ipython, jupyter, networkx libraries
  - Anaconda installer: py3.7 from https://www.anaconda.com/download/
- If needed: sections 3 to 5 of the python tutorial
  - https://docs.python.org/3/tutorial/index.html