Cytoscape 3.0 new features

• New Cytoscape 3.0 provides a modular architecture
• New Cytoscape is made of OSGi bundles
  • API bundles
  • Implementation bundles
• To highlight differences, App's replace Plugins
• Apps are just another OSGi bundle so benefit of Cy3 modularity
• New modular architecture allows Apps depending on other apps
• New App store and App Manager
Cyni Toolbox App

- Cytoscape does not provide infrastructure for network induction
- Cytoscape Network Induction (Cyni) Toolbox puts together several tools that allow inducing networks from (biological) data
- Cyni has two main objectives:
  - Provide a framework to bioinformaticians to develop and apply their techniques
  - Make network induction more accessible to biologists by providing user-friendly solution
Cyni Main Features

• Cyni App is formed by two bundles:
  • API bundle: Flexible but keeping backward compatibility
  • Implementation bundle: It can be extended at anytime

• Cyni App generates a framework that intends to reduce the effort for researchers to implement new induction algorithms on Cytoscape

• Two kind of app developers will benefit of this framework:
  • Developers willing to contribute new Cyni elements
  • Developers that just want to build on the functionality that Cyni provides
Cyni Platform Resources

• A generic Graphical User Interface
• A few network induction, imputation and discretization techniques ready to be used
• A Cyni API
• An extensible framework for the implementation of new Cyni elements
Cyni Structure

- Cyni is based on two main components:
  - Algorithms: Takes a table data to produce an output
    - Data Imputation
    - Data Discretization
    - Network Induction
  - Metrics (e.g., similarity/distance measures)
- Cyni Managers: To store and access Cyni elements
- Classification system to better manage different types of Cyni elements
- CyniTable: Internal table that allows accessing data more quickly and also provides other useful methods
Cyni Elements

- Data Imputation
  - Zero Imputation
  - Row Average (RAV)
  - Bayesian Principal Component Analysis (BPCA)

- Data Discretization
  - Equal Frequency/Width

- Network Induction
  - Basic Correlation
  - K2 Bayesian
  - Hill Climbing

- Metrics
  - Pearson Correlation
  - Spearman's Rank Correlation
  - Kendall's Tau Correlation
  - Bayesian Metric
  - Entropy
  - AIC
  - Minimum Description Length (MDL)
  - Bayesian Dirichlet Equivalent (Bde)
Resources for Cyni App Developers

1. Cyni documentation with architecture description
2. Cyni Tutorials
3. Sample code, which can serve as a starting point or template for app developers