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