COMP 572 Bioinformatics: Network Analysis
Homework Assignment #2
Fall 2009
Due Date: October 15, 2009 (a PDF emailed to me and the TA).

The goal of this homework assignment is for you to decide on a project. Submit an initial report (2–3 pages) of your project. The report should have sufficient details about several items which include, but are not limited to:

- The biological question(s) that the project addresses with sufficient details about the background.
- The objective(s) of the project.
- The (computational) experimental design that you will use to achieve the objective.
- The computational tools that will be used.
- The data that will be used.
- The computational analyses/experiments that you will use to
- Properly cited bibliography.
- If multiple students are collaborating on the project, briefly describe the role of each student.

Types of projects. Your project can investigate any type of question as long *computational analysis of biological networks* is involved. In other words, please do not investigate social, political, etc., type of networks, and do not work on a project that does not involve computational modeling and/or analysis.

Very general ideas for research:

- Network modeling of a specific biological system, and study of its properties.
- Investigating the performance of different tools on a biological system.
- Analysis of experimental data with respect to a biological network, or in a network-centric approach.
- An empirical evaluation of the strengths and weaknesses of a computational methodology for analyzing networks.
- Defining new types of biological networks, from any biological domain (evolution, ecology, etc.), and investigating their properties.
- Analyzing network(s) with respect to a certain disease.
- Systematically investigating published results that use network-based analyses.
- Theoretical (mathematical) analysis of a network model or methodology.
- Developing new algorithm(s) for network analysis task(s), with implementation and performance study of the algorithm(s).

- New models of random networks, network evolution, etc., with a study demonstrating the utility of such models, and how they contrast to existing models.

You may want to consult the following link on the course website for tools/data/resources/etc.:

`http://www.cs.rice.edu/~nakhleh/COMP572/NetworkResources.html`

If you decide to work in a group (at most two students per group, and in exceptional cases, three students are allowed), I'd highly recommend that students with a biology background team up with students with a computational background.

[**Only one report to be submitted by a group.**]