CS 7001: Introduction to Graduate Studies October 25, 2006

Assignment 3: Fundamental Concepts

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This assignment is due on **Friday, November 6, 2006 at 11:59 p.m.** We appreciate creativity, but please do not invent your own deadlines.

1 Purpose of this Assignment

The purpose of this assignment is to help you think about both the current state of the art in your particular research field, as well as the major lasting intellectual contributions to your field.

Revisiting lasting research contributions is a useful exercise that is performed in many disciplines. See, for example, the "Recommended Reading" column that appears in ACM's *Computer Communication Review*: `http://www.sigcomm.org/ccr/drupal/?q=node/61`.

In addition to helping you think about the "big ideas" from your area, this assignment is also designed to help you develop your teaching skills; you may be asked at many points in your career to summarize the contributions of your field.

This will also prepare you for the next assignment (helpful hint: PS 4 will, in some ways, be an analog to PS 2).

2 Your Task

Your task is to create a "high level" syllabus for a first-year Ph.D. course in your research area. (By "high level", we want you to focus on identifying themes that you would want to teach from your area, rather than doing mundane things like designing assignments, tests, etc.). Your syllabus should be organized roughly as follows:

1. 4-5 fundamental concepts from your area. You should provide a 2-3 sentence summary describing each concept.
2. for each concept, 2-4 "lectures" which represent important sub-topics or details related to that area. (One sentence per detailed idea is fine.)
3. 2 big open problems from the area. Two-sentences per problem is sufficient.

An outline is sufficient. Making lectures is not required!

To help you get started: From networking, a fundamental concept could be "tree building" and might include a lecture on Internet routing. From machine learning, a fundamental concept could be "generalization", which might include a lecture on cross-validation.

In addition to performing the group work for this assignment, every student should turn in their own syllabus. The group should then turn in a merged syllabus reached by consensus.

Note: This assignment is difficult. In fact, you will probably find that most syllabi are not organized in this way because even experts have a hard time doing this! Where there is ambiguity, just make a decision.

There will be no presentation for this assignment.