CMSC 858S: Algorithms in Networking
Fall 2004
Writeup for the Class Project

One part of the course project will be to read a series of papers on a particular topic, and coming up with a writeup of at most 20 pages, excluding the bibliography (using normal, readable spacing – double-spacing not required).

Goals

The writeup should satisfy the following goals:

- Among other aspects, it should cover algorithmic/mathematical novelties (even if these are not proven guarantees) in networks and systems.

- It should be accessible to a beginning graduate student in Computer Science, who should obtain a solid knowledge of the topic after reading your writeup.

- The writeup is not meant merely as a survey of the topic. It should contain: (i) the insights and comments you have distilled after reading these papers, and (ii) open problems that you have been able to come up with. These two aspects, which indicate the level of understanding you have attained in the topic, will determine your score on the writeup to a large extent.

- A good bibliography (references) should follow the writeup.

- It is not important to "fill up" the 20 pages with material! As mentioned above, your own take on the topic, is most important.

Your writeup will be distributed to all students in the class, so that we can all benefit from your learning. You are also encouraged to publish your writeup as a Technical Report in your department.

Timeline

A few topics are suggested in the next section. (If you would like to do the project on a different project of your choice, please come talk to me immediately.) The timeline for doing the project is as follows:

- You (i.e., your project team) will email me your top-three choices of topics, by Monday, 9/20.

- I will do my best to honor your requests, and assign you a topic and an initial paper (or papers) that you can start from, by 9/25. Please note that you may be unable to get any of your choices, if there is much demand for some topics.

- You start from the given paper(s), and get a quick high-level understanding of the pertinent literature. Then, you will email me, by 10/12, two lists: (a) a short list of primary papers which you will describe in depth, and (b) auxiliary papers which you will survey briefly. Please email me these in .pdf format.

- I will respond to you by 10/17, making suggestions if any, or OKing your choices.

- You will email me, as well as the entire class, your final writeup (.pdf file) by 12/5. Again, this should be at most 20 pages, excluding the bibliography (using normal, readable spacing – double-spacing not required).

As always, you are asked to make steady progress on the writeup, so that you are not pressed for time at the end, forcing you to do a less-satisfactory job than you would have desired.

Topics

The descriptions given in parantheses for some of the topics are meant to approximately describe the emphasis we will be placing.

1. P2P systems and algorithms that are sensitive to network-distance

2. Models for network topologies (graph theory, random graphs, measurements)

3. Internet measurements (measurements and algorithms)

4. Sensor networks: empirical studies

5. Sensor and wireless networks: theoretical studies (e.g., analysis of models such as random points in unit-square etc.)

6. Clustering large datasets (more mathematical, based on linear algebra and probability)

7. Game-theoretic aspects

8. Capacity of wireless networks (somewhat more EE-focused)

9. Tornado codes, LDPC codes, digital fountain approaches (somewhat more EE-focused)