Analysis and Prediction of the Dynamic Behavior of Hosts and Networks

Project Ideas

NOTE: PRELIMINARY

Comments

The following are various ideas that I think could lead to cool projects in this course. You are not obligated to use any of these ideas. The most important thing is that the project you choose will hold your interest for at least the rest of the quarter. Ideally, you already have data sets from your existing research that you want to work with.

In any case, you should choose or design a project in consultation with Peter. You must formally propose your project in a one page document. Over the course of the quarter, you must also hand in two one page project updates. At the end of the quarter, you must hand in a 10 page (SIGMETRICS 2 column format) paper documenting your project and its results, and give a 20 minute public presentation of your work.

Example Ideas

1. Use seasonal time series models to detect parallel programs (especially bulk-synchronous parallel) applications running on a LAN.
2. Apply time series analysis to music signals.
3. Apply time series analysis to predict NLANR and other network traces.
4. Study the Myers web mirror traces.
5. Write a survey paper on chaotic dynamic approaches to signal prediction. (survey papers shall be considerably more in-depth than project reports)
6. Develop a Kahlman prediction filter for RPS and evaluate its performance.
7. Develop an Innovations algorithm-based implementation of RPS's prediction filters and evaluate its performance.
8. Study my host load traces using a new technique, such as wavelets or Abarbanel's methodology for chaotic dynamics
9. Instrument an interactive windows program and perform a user study to determine how its resource demand varies over time.
10. Study web client traces to characterize how users interact with the web.
11. Collect LAN or wireless network traces within the CS department and analyze them
12. Study the Judd wireless network traces from CMU
13. Study file access patterns using the Kroeger traces from UCSC
14. …
15.