Welcome to CSE 521p
Applied Algorithms

Administrivia

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  - Office hours, by appointment

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  - Office hours: Monday 5:30 – 6:15pm
- **Course web page:**
  - http://courses.cs.washington.edu/csep521

What is this course about?

- **Algorithms in the modern era**
  - **approximation, randomization**
  - **Different models for how input is received and constraints on algorithms: online, streaming, high-dimensional**

- **Goal: expose you to a sampling of ideas, techniques, tools and applications.**

Tentative list of topics

- **Hashing and related topics**
  - Universal hashing, perfect hashing, load balancing, min-hashing, locality sensitive hashing, and applications to streaming
- **Linear programming**
  - Duality + applications, then bit of convex optimization
- **Online learning**
  - Multiplicative weight updates, applications and extensions
- **Dealing with high-dimensional data**
  - Dimensionality reduction, low rank approximation, etc.
- **Sampling of other topics**
  - ??

Goals

- To introduce you to some of the fundamental ideas that have become important in algorithms in the last 20 years.

- To show you how much fun, beautiful and clever these ideas are

- To convince you that knowing more about algorithms and theory will serve you well.

- To help you develop a toolkit and a comfort level that is useful in all walks of (computer science) life.

Background expected

- Discrete math at level of CSE 311
- Introductory probability at the level of CSE 312:
  - Probability space, random variables, basic distributions, independence, conditional probability, expectation, tail bounds
- Intro algorithms and data structures (e.g., CSE 332)
- "Mathematical maturity"

Workload

- 5-6 problem sets (60%)
- Project (40%)
  - Must work in pairs.
  - One-page pre-proposal due by April 28
  - Final (10 page) paper due on June 1.
  - Will be posted to class discussion page.
  - You will be commenting on each others papers
  - Each group will give a short presentation as well.

Other

- No book, but I'll post lots of references.

- Questions?