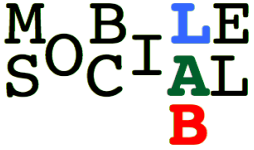
Lecture 0:Welcome to the class!

Who should take it? How to attend?

CSEE 4991: Computer Networks

Tuesday January 17th



Objectives of this class

* Learn fundamental concepts of networking
  - And how they apply (or not) to the Internet

* Learn how to program with network protocols
  - And how to program protocols
  - Go beyond using libraries as black boxes

* Learn about network performance

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Why Take this class: Reason #1/3

* 1969 was quite a year!




  - And, by the way, the Internet was born (Oct. 29th)

* Nobody noticed, but in retrospect that is the event that had the largest impact on the world!

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Why Take this class: Reason #2/3

* Today, almost all computing apps are networked
  - Enterprise, Games, Social Net, P2P, Cloud
* This adds a lot of challenge
  - Deal with asynchronicity / unreliability
  - Resources sharing should be fair and scalable
  - How to make different competing systems cooperate
* Not easy, still mostly unsolved
  - In clouds, network today remains difficult to price!

Why Take this class: Reason #3/3

* It's a requirement!
  * Because this covers background for more advanced classes and projects in computer networks
* Including (but not limited to):
  * *4180 Network Security*
  * *6998 Cloud Computing: Concepts and Practice*
  * *6998 Cellular Networks and Mobile Computing*
  * *6951 Wireless and Mobile Networking*
  * *6778 Applying Networking Tech. to Physical Systems*
  * *Many related groups in projects*

Why NOT take this class!

* You are not ready! Prerequisite
  - Probability: some background at introductory levle
  - Programming: be confortable in C and/or Java
* You are too much ready!
  - No need to repeat your first networking class!
  - Please come to ask for advices on advanced classes
* You want to focus solely on one related topic:
  - Physical layer, Security, Applications

How to pass this class

* Come prepared to 2 lectures per week
* Office hours: as close to the course as possible!
  Tuesday-Thursday until 3:30pm, CEPSR 6LW5 or 610
* Grading:
  - 5~6 written assignments (20%)
  - 2 mid-sized programming projects (20%)
  - 1 midterm (75mn, ~ March 1st, closed books) (25%)
  - 1 final exam (3h, ~ May 8th, closed books) (35%)
  - Class participation (+%)

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More on the course

* Main source: Wiki
  (forget coursework, CVN)
  slides, assignment, etc.

  http://compnet-spring2012.wikischolars.columbia.edu/
* Webboard (24h max delay)
* Integrity / Assignment Rules
* The “Apple” Policy

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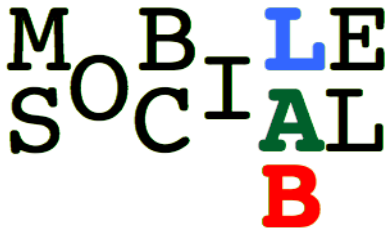
A bit about myself

* Worked first as undergrades in 1999 in Bay area
* Attended ACM SIGCOMM since 2000
* Studied at ENS-INRIA in Paris (Ph.D in 2006)
  - Interns at Sprint, Alcatel, IBM, Intel
  - Worked 5 years for Technicolor (formerly Thomson)
* Works on Mobile and Social Networks
  - Previously on multicast, TCP congestion control, p2p
  - Emphasis on performance of networked algorithm



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Roadmap:

- Part I (1-3): The *Internet*, seen from 10,000 feet
- Part II (4-8): The Applications
  - Web, Email, P2P, HTTP, FTP, DNS, Socket
- Part III (9-14): Transport Layer
  - ACK, Retransmission, TCP, UDP, Congestion, Resource
- Part IV (15-20): Network Layer
  - Addressing, IP, Routing, OSPF, BGP
- Part V (21-25): Link Layer
  - MAC, CSMA, 802.11