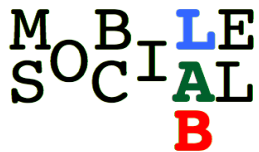


# Lecture 0: Welcome to the class!

*Who should take it? How to attend?*

CSEE 4991: Computer Networks  
Tuesday January 17<sup>th</sup>



# Objectives of this class

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



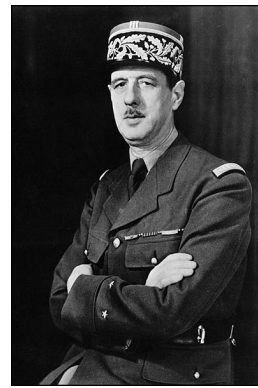
- \* Learn how to program with network protocols
  - And how to program protocols
  - Go beyond using libraries as black boxes



- \* Learn about network performance

# Why Take this class: Reason #1/3

\* 1969 was quite a year!



o And, by the way, the Internet was born (Oct. 29<sup>th</sup>)

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

# 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 level
  - Programming: be comfortable 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

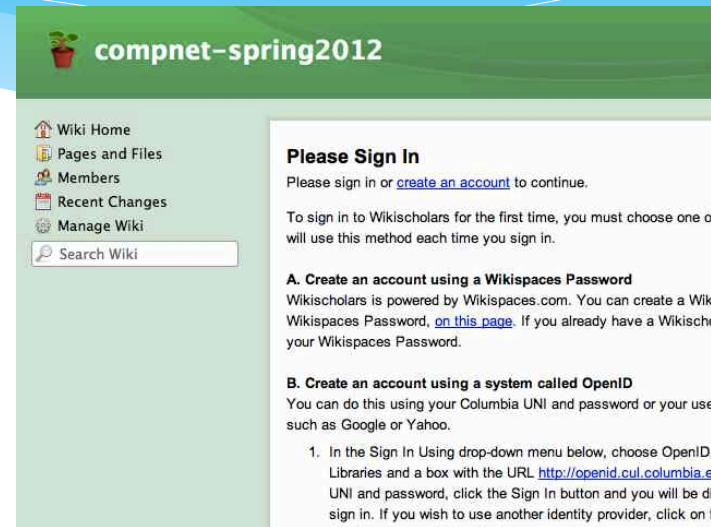
- \* Come prepared to 2 lectures per week
- \* Office hours: as close to the course as possible!  
Tuesday-Thursday until 3:30pm, CEPSR 6LW5 or 610
- \* Grading:
  - 5~6 written assignments (20%)
  - 2 mid-sized programming projects (20%)
  - 1 midterm (75mn, ~ March 1<sup>st</sup>, closed books) (25%)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

# 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





# A bit about myself

- \* Worked first as undergrads 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

M O B I L E  
S O C I A L  
B

# 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

