Midterm Review

- When: Mar 6 (Tu) 2:00-3:15 pm
- Where: ST 302
- closed-book and closed-notes, you are allowed to bring a cheat sheet to each exam (one letter page single-sided)
- Topics covered
  - Overview: [Kurose&Ross 1.1-1.5]
  - Statistical multiplexing and queues: discrete probability and [Srikant and Ying 3.1-3.4]
  - Application layer: [Kurose&Ross 2.1-2.5, 2.7], [Srikant and Ying 8.2-8.3]

Introduction

- Network edge: hosts/switches/links, services, protocols, access networks
- Network core
  - circuit switching: multiplexing (FDM, TDM)
  - packet switching: store-and-forward, statistical multiplexing
- Performance measures:
  - Four types of delays
  - Queueing and packet loss
  - Throughput

Statistical Multiplexing and Queues

- Discrete probability
- Statistical multiplexing
  - The Chernoff bound
- Discrete-time Markov chains
  - state transition diagram, transition probability matrix
  - irreducible/aperiodic chains, stationary distributions, local balance equations
- Queues: Geo/Geo/1, Geo/Geo/1/B
- Little's law

Application layer

- Basic principles
  - client-server vs. peer-to-peer, addressing (IP address & port)
  - transport service requirement of various applications
  - services provided by Internet: TCP, UDP
- Important applications and protocols
  - Web and HTTP: non-persistent vs persistent HTTP, request/response, cookies, web caches
  - Email: protocols involved, SMTP vs. HTTP
  - Domain Name System (DNS): name resolution procedures, four types of DNS records
  - Peer-to-Peer File Sharing: BitTorrent, file distribution (CS vs. P2P), structural P2P File sharing