CS 241: Wrap-up and beyond

CS 241
May 2, 2012
University of Illinois
Announcements

Review material, review session info posted by Friday
  • Check Piazza

Brighten’s office hours today
  • Make that office hour...
  • 4-5 pm only (due to departmental meeting)

Final grade cutoffs
  • Likely $\geq +3\%$ to your grade
What have we learned?

We’ve come a long way...

- Write, compile, debug, and execute C programs
- Interact with the operating system via POSIX system calls
- Understand memory allocation and virtualization
- Create and manage many processes and threads
- Control scheduling of proc./threads
- Communicate & share resources between threads
- Use communication protocols (TCP/IP) and interfaces (Sockets)
- Write distributed multi-threaded apps that talk across a network
What have we learned?

We got real.

• A real memory allocator
• Multiple real nontrivial parallel applications (sort, make)
• A real big data processing framework
• A real web server
Great Ideas in Computer Systems

The power of layered abstractions
  • Modularity to help deal with many complex interacting parts
  • Virtualization of physical resources for flexibility

It’s all just bits
  • Appreciate the lower level that produces the abstractions

Concurrency
  • to match the logical flow of events
  • to deal with big data and big computation

Defensive programming
  • Making your code robust to unexpected errors or strange inputs
Courses building on 241

411 Database Systems
414 Multimedia Systems
418, 419 Computer Graphics
420 Parallel Programming
421 Prog. Languages & Compilers
423 Operating Systems Design
424 Real-Time Systems
425 Distributed Systems
426 Compiler Construction
427 Software Engineering, I
431 Embedded Systems
433 Comp. Sys. Organization
438 Communication Networks
439 Wireless Network
461 Computer Security I
463 Computer Security II
...and more!
CS 423: Operating Systems Design

Topics

- In-depth knowledge of how basic OS functions work
- Knowledge of virtual machines
- Introduction to advanced OS topics
- Distributed system issues, embedded system issues, quality of service, etc.
- Ability to modify OS code

Prof. Tarek Abdelzaher, Fall 2012
CS 425: Distributed Systems

Design, implementation, & management of distributed systems

• Failure detectors
• Election, distributed agreement
• Replication
• Security
• Probabilistic protocols
• Self-stabilization
• Measurements, etc.

Context: real-life and deployed systems

• clouds and datacenters, databases, peer to peer systems, clusters, etc.

Prof. Indy Gupta (Fall 2012)
CS 438: Communication Networks

Networked communication: How to build the Internet
  • Ethernet, IP, TCP, routing, congestion control, DNS, security, content distribution
  • Performance measurement and basic notions of probability and statistics for performance prediction

Fall 2012 and Spring 2013
CS 498 LA: Undergrad Research Lab

Apprenticeship-style, hands-on laboratory

Goals

• Pose testable research questions
• Write competitive grant proposals
• Create novel solutions using software and/or hardware
• Draw valid scientific conclusions
• Present and publish results

For more

• https://wiki.engr.illinois.edu/display/cs498la/Home
• https://wiki.engr.illinois.edu/display/url/Project+Proposals
Discussion of (networking) research
ICES forms