Com S 552 Principle of Operating Systems (Spring 2011)

Course Credit: 3.0

Lecture Time: 2:10-3:30 pm Tuesday & Thursday (tentative)
Lecture Location: TBA

Pre-requisite: Com S 352

Topics

- Process Synchronization & Deadlock
  Review and in-depth study of theories, mechanisms, algorithms and programming skills for process synchronization and deadlock prevention/avoidance/detection
- Distributed Mutual Exclusion
  Theoretical foundations of distributed systems; a variety of distributed mutual exclusion algorithms
- Failure Recovery & Fault Tolerance
  Failure models, process resilience, virtual synchrony, distributed commitment, etc.
- Protection & Security
  Information protection models; cryptography basics (private key cryptography, public key cryptography, authentication, digital signature, etc.); emerging cryptographic algorithms and their applications (group signature, attribute-based encryption, blind signature, etc.)
- Embedded OS: TinyOS
  Basics of nesC language; design principles of execution model, threading, communication, storage management, power management, resource arbitration, etc.; reading/modification of OS source code; experimental platform
- Cloud Computing Systems
  Concepts, system examples, research on cloud system security, etc.

Course materials

- Lecture notes
- Reference textbook
- Technical articles from journals and conference proceedings

Score Allocation

- Class participation: 5%
- Three to four individual-effort assignments (small-scale algorithm design, programming, and/or experiment): 30%
- One research-oriented group project (including proposal, midterm and final presentations of the project): 35%
- Two exams: 30%

Instructor & Teaching assistant

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