

CS653 Mobile Computing

Spring 2014

Course Overview

- PG elective course, open to PG and UG students.
- Prerequisites: a previous course in networking (CS348 or CS641 or equivalent)
- Topics in wireless communications and mobile systems (wireless LANs, cellular systems, sensor networks etc.)

Grading

- Course project – 30%
 - Will involve analyzing traces from wireless experiments, and running wireless simulations using network simulators
 - Will learn how to analyze and understand wireless systems
 - Requires basic scripting and coding skills
 - Teams of 3 students each
 - Monthly reviews with instructor to monitor progress
 - Final report, presentations, individual viva

Grading

- Course project – 30%
- Short in-class quizzes – 20%
 - 2 quizzes during the semester in class
 - Dates will be announced in the previous lecture
- Mid-semester exam – 20%
- End-semester exam – 30%

Course Content (1)

- Overview of wireless and mobile systems (wireless LANs, cellular systems, sensor networks, etc.) and the challenges therein.
- The radio channel and wireless physical layer design.
- Medium access, multiplexing, link adaptation.
- Multicast, opportunistic routing, flooding, and other techniques exploiting wireless broadcast and receiver diversity.
- Multihop routing protocols, routing metrics.
- TCP behavior over wireless, other transport layer issues.

Course Content (2)

- Solutions to handle mobility at various layers of the networking stack, handling disconnected operations in applications.
- Energy efficiency in mobile systems.
- Mobile security.
- Localization and service discovery techniques.
- Smartphone-based mobile computation and applications.
- Future directions: dynamic spectrum access, heterogeneous networks, internet of things.

Readings

- Slides from lectures will be available on the course web page.
- Reference text book: Mobile Communications (2nd ed.).
Jochen Schiller.
- Research papers will also serve as references.