CSE 291D: Topics in Wireless Networking

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Class Structure

- We will present papers in class for discussion
  - Usually 2 papers per 1.5 hour class

- Everyone presents (*including me*)
  - How many depends on # students registered
  - I will present papers that are left unassigned

- Signup sheet will be passed around and available on my office door.
Administrivia

- Topics in Wireless Networking is a seminar
- Class is for 4 credit hours, letter grading
  - Participate in class discussion (15%)
  - Write daily evaluations (15%)
  - Present a couple of papers (25%)
  - Complete a term project (60%)
  - *No problem sets or exams*
- Instructor: Alex C. Snoeren
  - snoeren@cs.ucsd.edu, (858) 822-2289
  - Office hour: Thursday 1-2pm, EBU3b 3114
Evaluations

- **Read the papers!**
- **You must submit evaluations of papers**
  - Email them to me by *6am* on day of class
  - No written evaluation if you are presenting
- **Brief (.5-1 page)**
  - Summary of paper (research problem, conclusions)
  - What you learned
  - Any ideas that occurred to you
  - Your frank opinion of topic and/or work
Class mechanics

- The presentations are for fostering discussion
  - …so I expect you to participate in discussions

- Presenters
  - Give brief overview of the paper and an evaluation
  - Come prepared with discussion questions

- Everyone else
  - Use your evaluations as a basis for discussion
Project

- Work in pairs/triples -- groups due next week
- Full schedule is on the Web
- Start thinking about what you might want to work on, who you might want to work with
- I’ll post some topics, but I encourage you to use your own
- Your final will be a class presentation on your project during the last class and exam period
Project resources

- 192-radio sniffer infrastructure in CSE department
  - Also have initial deployment in a municipal wireless network
- CalRadio hackable 802.11 radio
  - Can change almost anything about the 802.11 MAC
- Fully configurable software radio platform
  - Can experiment even outside 802.x parameters
- Multiple Wi-Fi VoIP phones with PBX
- Ericsson Bluetooth development platform
- 802.11-capable Roomba
Free Loader Policy

- Class attendance is **encouraged**
- Sign up for exactly 2 credit hours
  - S/U grading
- You do not have to do the project
- You must do the evaluations and presentation(s)
- If you have a special concern, see me
Topics to be Covered

- Media access (1 paper)
- Routing (10 papers)
  - Ad-hoc, geographic and mesh
- Power management (6 papers)
  - Rate adaptation
- Deployment experience (6 papers)
  - Wi-Fi hotspots, campus, and mesh networks
- Broadcast tricks (3 papers)
- Mobility management (4 papers)
- Security & Privacy (4 papers)
Routing (ad hoc)

Routing (mesh & multi-radio)


Power management

- [Int+00] Chalermek Intanagonwiwat, Ramesh Govindan, and Deborah Estrin, Directed diffusion: a scalable and robust communication paradigm for sensor networks.
- [KB02] Ronny Krashinsky and Hari Balakrishnan, Minimizing energy for wireless web access with bounded slowdown.
- [Won+06] Starsky H. Y. Wong, Songwu Lu, Hao Yang, and Vaduvur Bharghavan, Robust rate adaptation for 802.11 wireless networks.
Deployment experience

Broadcast tricks

- [BM05] Sanjit Biswas and Robert Morris, **ExOR: Opportunistic Routing in Multi-Hop Wireless Networks.**
- [Kat+06] Sachin Katti, Hariharan Rahul, Wenjun Hu, Dina Katabi, Muriel Medard, and Jon Crowcroft, **XORs in the air: practical wireless network coding.**
Mobility management

- [Per98] Charles E. Perkins, *Mobile Networking through Mobile IP.*
- [SB00] Alex C. Snoeren and Hari Balakrishnan, *An End-to-End Approach to Host Mobility.*
Security & privacy

- [BGW01] Nikita Borisov, Ian Goldberg, and David Wagner, Intercepting mobile communications: the insecurity of 802.11.
- [BP00] Victor Bahl and Nitin Padmanabhan, RADAR: An In-Building RF-Based User Location and Tracking System.
- [FC06] Daniel Faria and David Cheriton, Detecting Identity-Based Attacks in Wireless Networks Using Signalprints.
For next time

- Read:
  

- Sign up for a paper presentation

- Start forming groups for term projects
  - 2-3 people per group
  - Begin thinking about possible topics