Principles of Wireless Sensor Networks

https://www.kth.se/social/course/EL2745/

Lecture 13
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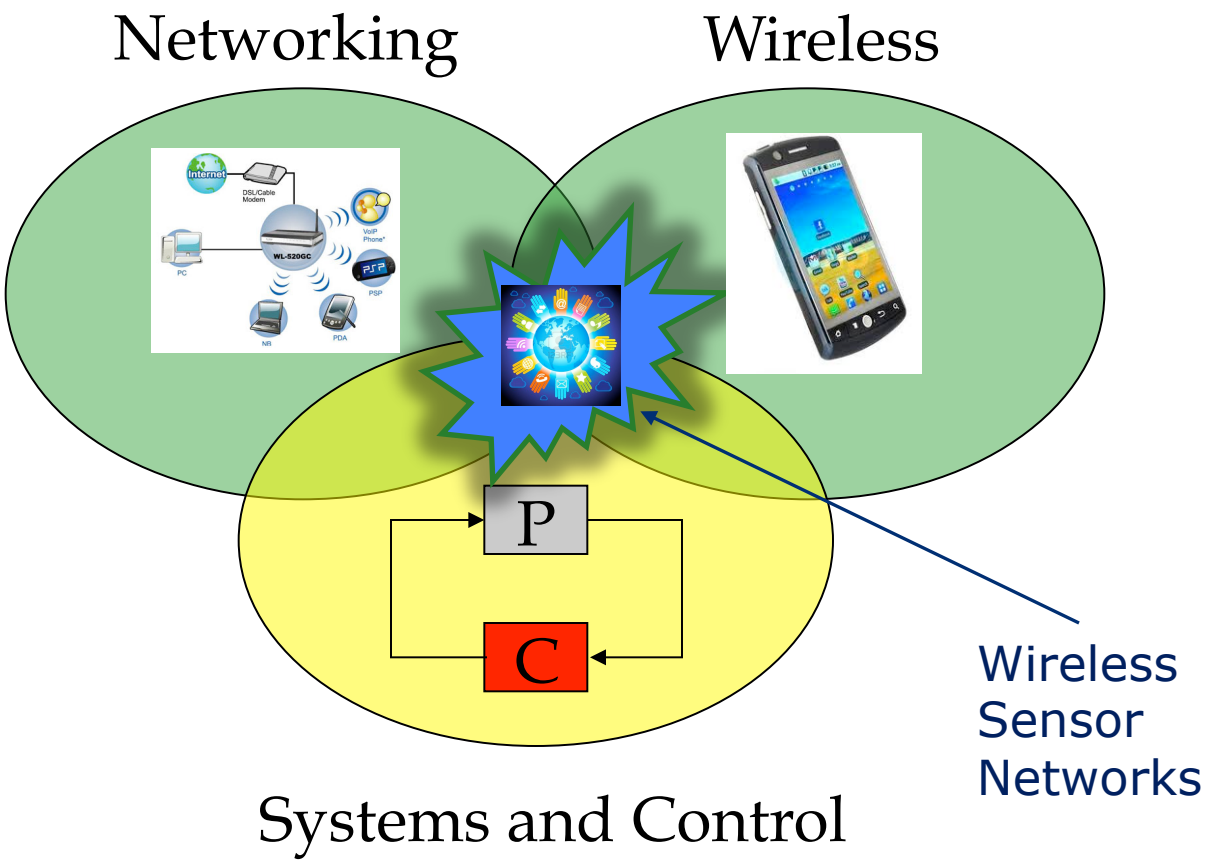
Today's lecture

- **Exam's rules**
- Review of the course content by project presentations
  1. Wireless channel
  2. Physical layer
  3. Distributed Detection
  4. Distributed Estimation
  5. Localization and Positioning
  6. Synchronization
  7. Wireless Sensor Networked Control Systems 1
  8. Wireless Sensor Networked Control Systems 2
- Future work

Today's learning outcome

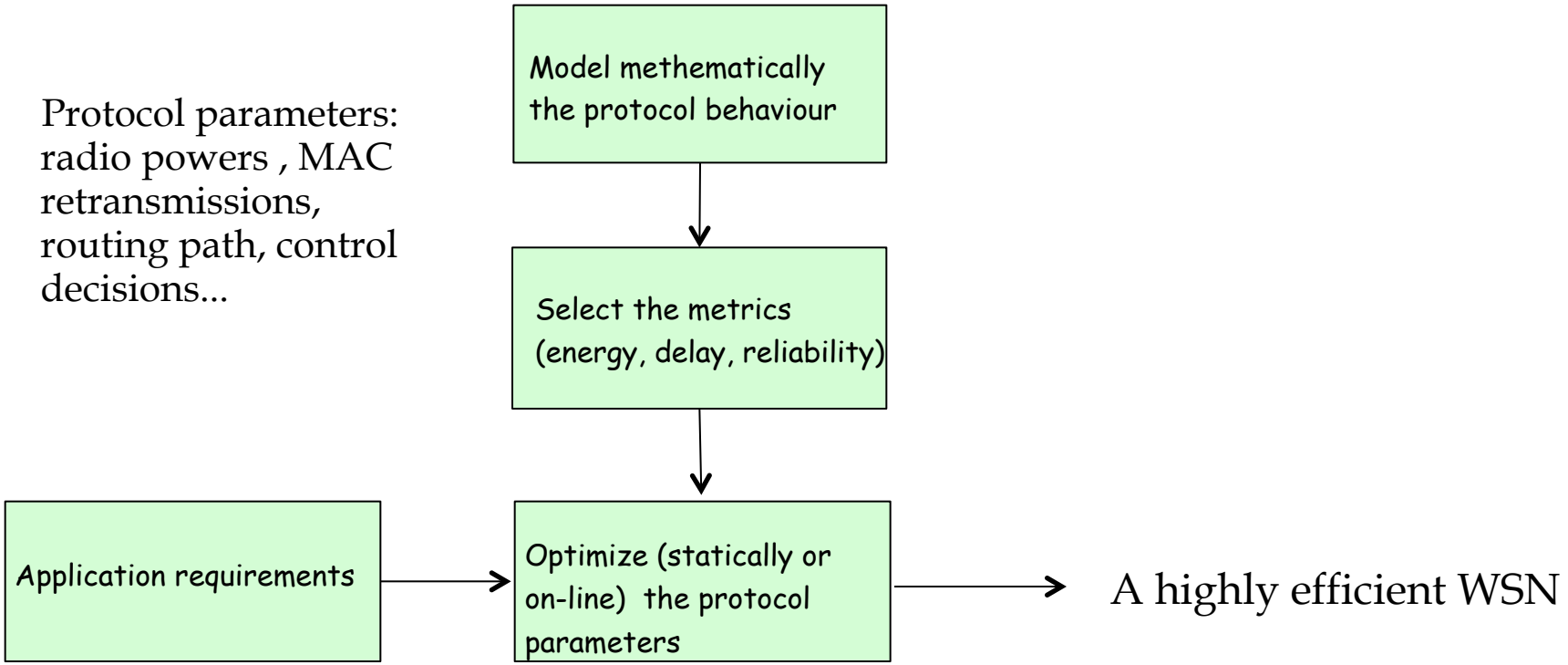
- What you should remember form the course?
- How to design WSNs?
- And also
  - How to get an A to the exam
  - Suggestions for Master thesis projects
  - Suggestions for a career in academia

Wireless Sensor Networks



WSNs design

Protocol parameters: radio powers , MAC retransmissions, routing path, control decisions...



The role of mathematical modeling and optimization is central

Exam, March 14-th, 08:00-13:00

- 5 exercises chosen on every part of the course, inspired from the exercises of the compendium and homework
- 5 hours to complete the exam
- **Allowed** to bring lecture notes, reading material, and handouts, and basic books on math, e.g., Mathematics Handbook by Råde & Westergren
- **Not allowed** to bring exercise lecture notes
- **Not allowed** to bring compendium with exercises and solutions
- Results available after 1-2 weeks

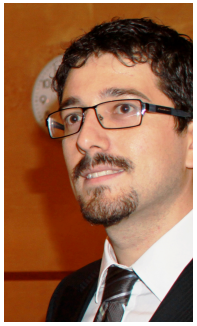
Master thesis projects

- Theoretical, practical, or business oriented
- Conduct forefront research
- Possible collaboration with industry
- Interaction with Professors, Research Associates, and PhD students
- You can propose the topic, or ask for a project on
  - Distributed optimization over WSNs
  - Distributed detection and estimation
  - Design of wireless sensor networked control systems
  - Future wireless networks
  - Internet of Things
  - MAC, Routing
  - Smart grids
  - Privacy
  - …

PhD in Electrical Engineering

- For motivated and hard working students with high grades (i.e., talented students), possibility of pursuing a PhD
- Pretty high salary for studying
- International collaborations and travel, UC Berkeley, Stanford University, MIT, Caltech,…
- Competitive
- World-wide job market
- Research (50%), courses (30%), teaching (20%) = fun (100%)
- 4-5 years to earn the PhD

Some success stories…

- Pangun Park, PhD 2011 on WSNs, took my master thesis project
  - Admitted to the PhD program at KTH EE School in 2007
  - Now Research Associate at University of California at Berkeley, Electrical Engineering and Computer Sciences Department, Thrust Center
- Piergiuseppe Di Marco, PhD on WSNs in 2013, took my master thesis project
  - In 2012 was for 6 months at University of California at Berkeley, Electrical Engineering and Computer Sciences Department, DOP Center