

University of Ottawa, Fall 2010  
**Wireless Ad Hoc Networking**

Instructor: Ivan Stojmenovic

**List of *projects*:**

Projects based on textbook chapters:

Amiya Nayak and Ivan Stojmenovic: **Wireless Sensor and Actuator Networks: Algorithms and Protocols for Scalable Coordination and Data Communication**

1. Sink mobility in wireless sensor networks (Chapter 6)
2. Coordination in sensor and actuator networks (Chapter 9)
3. Sensor placement in sensor and actuator networks (Chapter 10)

*Mobile Ad Hoc Networking*, (S. Basagni, M. Conti, S. Giordano, I. Stojmenovic, eds.),  
IEEE Press/Wiley, August 2004.

4. Chapter 12 *Ad hoc Networks Security* by Pietro Michiardi and Refik Molva

Projects on sensor networks (most of them will start from a book chapter in ‘Handbook of Sensor Networks’, Wiley)

5. Key Management in Sensor Networks (Chapter 5, and a book chapter by instructor)
6. Embedded operating systems for sensor nodes (Chapter 6)
7. Time synchronization and calibration in sensor networks (Chapter 7)
8. Medium access in sensor networks (Chapter 8)
9. Position determination in sensor networks (Chapter 9)
10. Path exposure, target location, classification and tracking in sensor networks (Chapter 14)
11. Data gathering and aggregation in sensor networks (Chapter 15, slides)

Other projects

12. Sensor database systems
13. RFID and sensor networks
14. Transport layer in ad hoc and sensor network
15. Data mining in sensor networks
16. Bluetooth scatternet formation
17. Security in sensor networks
18. Peer to peer ad hoc networks
19. Middleware for sensor networks
20. Robot networks
21. Cognitive radio networks

**Project and class presentations:**

- 1) Select the first, second, and third choice of possible project from the list. Select also the first, second, and third choice for the presentation day in last 6-7 weeks of lectures. If you know that you will not be available for a particular date, include it (one only).

- 2) Send e-mail to [ivan@site.uottawa.ca](mailto:ivan@site.uottawa.ca) with your preferences for the topic (topic number(s) only) and date, *no later than three days before the third lecture*.
- 3) Topics and dates will be assigned in class, during the third lecture.
- 4) Prepare five minutes presentation on your topic. Include brief description of your project, what sources you identified or received so far, plan for future work, problems you have etc. Prepare one page information for instructor and each student in class. Include your e-mail address on the page. If you need two pages, use the back of the same sheet for the second page. Up to six transparencies may be used during presentation. Transparencies and the page should clearly define the *problems* you are going to study, and give brief description of the environments where these problems occur.
- 5) Give five minute presentation on your topics during the fourth week of lecturing. Distribute one page summary to instructor and each student before your presentation starts. The purpose of the short presentation is to confirm your presence in the class, get familiar with other students for possible cooperation on similar topics, and clarify possible misunderstandings.
- 6) Prepare your project presentation, and your project report. Communicate by e-mail a student in case you have same or similar topics assigned, or if you discovered an interesting source for their topics. Textbook based projects should take textbook material as the starting point; additions and modifications shall be made from newer articles. Projects should be mainly based on the information found on the Internet. It may include articles from journals, magazines, newspapers, and conference proceedings. *Look at my advice for preparing transparencies at [www.site.uottawa.ca/~ivan](http://www.site.uottawa.ca/~ivan).*
- 7) Give approx. **30** minutes presentation on the **date assigned** to you (the exact time limit will depend on the overall number of presentations). Before the presentation, distribute evaluation sheets to each student, with your name on them. It should contain few questions (of your choice) with answers from 1 to 10, and will be collected by instructor. The last question should be an *overall mark*, in the range 1-10. Your presentation mark is equal to the average overall mark. After presentation, you may still have time to improve and complete your report.
- 8) Your presentation shall include, at end of it, a list of three questions out of your presentation, with answers. No multiple-choice questions! These questions are candidates for the quiz during the last lecture. The quality of your questions is part of your evaluation. Avoid pure memorization, emphasize logical derivations, and examples showing understanding of main ideas presented.
- 9) In case this course is assigned a TA, submit your file with transparencies to the TA, for inclusion on a common web page for all the projects, one week before quiz at latest.
- 10) *Submit project report by the deadline.* The report should be approximately ten single space pages long (excluding title page, figures and reference lists), and written in the form of a paper. Begin with problem statement and then review literature. Divide articles on your topic into three groups, and list the references at the end in three separate parts accordingly. First part should be references that you read in full, understood most of writing, and devoted significant space in your report to review them (say one page to each of them). Second group should contain papers that were partially understood, or were mostly understood but their contribution was not considered to be high. Abstracts of these papers are understood (at least) and (in your own words) included in report (say, one paragraph for each). Third group contain papers which are within the subject, and were not really reviewed for a reason (very difficult to read, did not have time to do it because of too many papers on topics etc.). One sentence (or none) for such papers might suffice. Limit this list to only few articles that are judged to be important to mention. Pay attention to English language used in report.
- 11) Submit your report as .pdf file to [stojmenovic@gmail.com](mailto:stojmenovic@gmail.com).
- 12) More recent papers are more important. Paper included as major source does not need to be fully understood (some technical or mathematical details may be omitted) but its content must be clear.