COMP/ELEC 524: Mobile and Wireless Networking
Course Syllabus

Instructor

Dave Johnson, dbj@cs.rice.edu, Duncan Hall 3007, x3063. Office hours: TBA.

Teaching Assistant

TBA.

Class Meetings

MWF 1:00–1:50 pm. Location: Duncan Hall 1075

Course Description

Wireless networks have fundamentally different properties than typical wired networks, including higher error rates, lower bandwidths, nonuniform transmission characteristics, increased susceptibility to interference and eavesdropping, and higher variability of performance. Similarly, mobile nodes (computers) behave differently and have fundamentally different limitations than stationary nodes. For example, mobile nodes generally operate on limited battery power and may move and change their point of connection to the network at any time.

This course will examine the area of mobile and wireless networking, looking at the unique network protocol challenges and opportunities presented by wireless communication and node mobility. Although we will touch on some of the important physical layer properties of wireless communications, our focus will be on network protocols above the physical layer, with an emphasis particularly on the medium access control (MAC), network, and transport protocol layers.

Course Format

The course is structured around research publications in mobile and wireless networking protocols. The course involves intensive reading of research papers. I expect you to have read the papers in advance of the class discussion on them. Open, free, and informed class discussion will be essential to the understanding of this course.

There is no textbook for this course. Copies of the papers to be read for each class meeting will be handed out in prior classes and will be available on the course web site. You should read the papers before the class period in which they are covered in class.

When reading the papers for this class (and otherwise), you should think carefully about what the paper says and what it means. And think about what the paper doesn’t say. Why did the authors do what they did, and in the way that they did it? How else could they have done it? What did they leave out? What could be done next to follow on the work in the paper? What do you think they did right
and what do you think they did wrong (every paper has at least some problems). Think critically as you read these papers (and all papers). It will help you understand the paper better (and should, in the context of this course, help you do better on the exams and on your project in the class).

Also, pay attention to how the authors expressed themselves in the paper. Notice how they wrote the abstract and the introduction to the paper, how they presented related work, how they presented their conclusions. Notice how they described their protocol or algorithms, how they described the way in which they conducted their simulations or experiments, how they introduced and discussed their results. By paying attention to these types of things, you can become a better writer yourself, learning to avoid elements of writing styles you think don’t work well and learning to emulate elements of writing styles you think do work well (I mean emulating the style, not copying the paper itself). You will need to write a project proposal and project report in this class, and will be writing your own papers and other things throughout your career.

Assignments

In addition to reading the papers and attending and participating in class, there will be a midterm exam, a final exam, and a course project.

The course project will be handed out in a few weeks. The project will be done groups of about 3 students, and will involve design and simulation-based evaluation of some wireless protocol; you may use either the ns-2 or the ns-3 simulator in the project. The project will require a project proposal, and you are free to pick your own topic for the project, which I must approve based on your proposal. A final report for the project will be due at the end of the semester.

Course Web Page

The course Web page is located at http://www.monarch.cs.rice.edu/comp524/.

Here you will find an evolving copy of the course schedule and any important announcements relevant to the course, as well as a copy of this course syllabus and other information. You should check the course schedule and announcements often.

Grading

Your final grade for the course will be computed based on the following tentative weights for the individual assignments:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Class participation</td>
</tr>
<tr>
<td>30%</td>
<td>Course project</td>
</tr>
<tr>
<td>30%</td>
<td>Midterm exam</td>
</tr>
<tr>
<td>30%</td>
<td>Final exam</td>
</tr>
</tbody>
</table>

Prerequisites

You should generally have had some type of previous computer networking course such as Rice’s COMP/ELEC 429 (Introduction to Computer Networks) or COMP/ELEC 529 (Computer Network Protocols and Systems). In particular, you should be familiar with computer networking concepts from the MAC layer, network layer (including IP), and transport layer (including TCP). Having completed a previous course in operating systems may also be to your advantage but is not required.
Honor Code Policy

All assignments in the course are conducted under the Rice Honor Code. For more information on the Rice Honor System, see http://honor.rice.edu/.

In particular, the midterm exam and final exam, of course, must be your own work. During each exam, you may refer to any of the papers or copies of slides handed out in class and to your own notes you made from any source before starting the exam.

For the course project, your project group is expected to do its own work, and you must fully cite any sources that you use in any part of your project, including your project proposal, project report, and your simulation code and simulations you conduct as part of your project.

Students with Disabilities

If you have a documented disability that may affect your academic performance in this class, you should: (1) make sure this documentation is on file with Rice’s Disability Support Services (located in Allen Center room 111, adarice@rice.edu, x5841) to determine the accommodations you need; and (2) meet with me to discuss your accommodation needs.