Assignment: Wireless Networking Project
18-452/750 Wireless Networking, Spring 2020

The course project is an important part of the course, both with respect to learning objectives and grades (25% of the final grade). Projects will be executed by a team of two (preferred) or three students. Teams are expected to define their own projects, but there is a focus topic on information centric wireless networks described at the end of the handout.

A nice discussion on how to write a good project proposal is John Wilkes’ write up on project startup documents. While it targets larger projects, many of the points are useful for (interesting) course projects as well. Some features that I expect to see in a course project proposal:

- It is a good learning experience that will give you more depth in one particular aspect of wireless networking.
- There must be a concrete deliverable, e.g., reading X papers is not an acceptable project. Examples of deliverables include:
  - A new system design for communication, localization, etc.
  - A measurement study of how a specific wireless technology works under various conditions. This information is useful for optimization.
  - A comparison of competing wireless solutions under different wireless conditions or usage scenarios.
- It involves some notion of designing, building, and measuring a system:
  - The balance can be very different, e.g., if the focus is on measuring, but you need to design and build the measurement infrastructure
- There is a strong preference for projects that involve real wireless signals being abused by propagation through the ether.
  - Working with simplified wireless models is a lot less interesting.
  - Simulation may be a reasonable alternative in some cases.
- An ideal project proposal should have both a conservative goal that can be achieved with high probability, and one or more stretch goals that are more ambitious and exciting but be unrealistic.
- You should consider any risks associated with the project such as access to the necessary hardware or software.

Deliverables
The project has the following deliverables:

- A short e-mail listing team members, and 2-3 possible project topics, rank orders. Any additional early information (e.g., plan to use personal laptops, inspired by paper X, ...) will help the instructor provide early feedback.
- A projects proposal of 2-3 pages. The more detail you provide, the more feedback you can expect. The project should include:
• A problem statement why the project is interesting or important.
• A description of what you plan to do.
• What are the (concrete) expected results of the project and what experiments do you plan to run to evaluate them.
• What are the concrete deliverables.
• A set of milestones at 10-14 day intervals.
• Project requirements (e.g., hardware, ..) and risks.

- Checkpoints as specified in the project schedule. Details on format will be provided closer to the deadlines
- A short presentation at the end of the semester
- An extended set of slides describing the project based on feedback after the poster session. This extended slide set effectively is an information project report that provides a detailed overview not only of what you did, but also what you learned.
- Meetings with course instructor to discuss your project proposal and checkpoint.

### Milestones (approximate)

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Comment</th>
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<tbody>
<tr>
<td>Feb 19</td>
<td>Team and tentative topic</td>
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<tr>
<td>Mar 2</td>
<td>Project proposal</td>
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<tr>
<td>Mar 5-9</td>
<td>Meetings on Proposal</td>
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<td>Mar 23</td>
<td>Checkpoint 1</td>
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<td>Mar 24-25</td>
<td>Meetings on checkpoint</td>
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<td>Apr 6</td>
<td>Checkpoint 2</td>
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<td>Apr 22</td>
<td>Short project presentations</td>
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<tr>
<td>Last day of class</td>
<td>Final report</td>
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**Topics for projects**

The topic can be anything related to wireless networking as defined by:

- Topics covered in the lectures.
- Topics listed in the survey handout (not just those presented in class).

Past topics have been all over the map. See slides for topics from Fall 2018.

I have a small supply for Raspberry Pis and Arduino embedded systems that can be used for projects.