ECE 5990 RFID Systems Fall 2014

Project Proposal

Due on 5pm 10/23/2014

Your project proposal is limited to three pages, with 11 pt font and 1.5 line spacing. Ideally there should be 2 – 3 persons in a project. Any exception should be discussed with the lecturer individually. The proposal should include the following:

Project Team Member Names:

Email Addresses:

Project Title:

Project Description (around 600 words): Your project can have one or more of the following three focuses in an RFID-relevant topic. You will need to include a **feasibility assessment** and at least one **technical objective** (often coinciding with the quantitative analysis) in this project proposal. Most proposals will cover **only one** of the following foci.

- Application focus: You will need to describe the technical specification (range, reader size/power, tag size, protocol, etc.) required by the application. The feasibility assessment should include estimates on cost, marketability, deployment and maintenance. Example: I would like to do an airport luggage tracking system which can have higher read rate than the present UHF tags…
- System focus: You can set a system goal that is useful for generic RFID applications. You will need to give a block diagram for the components in your technical objective, including all of the signals (for the present status, guess their bandwidth, power level, etc.) in the block connection. Example: I would like to design a UHF system that can minimize the tag collision to achieve faster read in an unknown environment…
- Component focus: You will design or optimize one of the reader/tag components (for example, RF-to-DC converter with voltage regulation, SNR/NF studies in modulator/ demodulator, etc.), describe how the component will fit into the generic RFID system, and make projections on why your technical objective can improve some aspects of the system performance. Example: I would like to study the noise limitation in the receiver demodulator when I can get the local oscillator signal before the transmitting antenna…

Quantitative analysis: You need to describe at least one quantitative analysis for your proposed technical objective. This can be system optimization (analytically or numerically by tools like Maple or Matlab), simulation verification (such as in SIMULINK, SPICE, ANSYS, or other tools) or market analysis (such as regression analysis on a market forecast). The quantitative analysis should roughly have work appropriate for 40 – 50 man-hours of ECE graduate students.

References: You need to give at least **three** references that form the starting point of your work. Textbook and class notes do not count. Most popular conferences on RFID include *IEEE RFID Conference* (on system and applications), *IEEE MTT-S Symposium* (on electromagnetics), *ISSCC* (on circuit components) and *IEEE Globalcom* (on protocols). The textbooks in syllabus also give reasonable collection of previous works.

Submission: You will submit an MS Word file directly as an email attachment to kan@ece.cornell.edu. Feedback will be given in a week so that you can start your project. Further modification in technical objectives is surely allowed after feedback.

Grading: Project proposal will be 10% of your total grading, and will have the following guidelines:

- Writing (2%)
- Understanding of the RFID system in the project proposal (3%)
- How feasible and specific the technical objectives are described, including the quantitative analysis (4%)
- Whether the references are appropriate (not how comprehensive or complete, but sufficient starting materials) (1%)

Project Presentation Grading Guidelines (11/20 and 11/25):

Each group has 20 mins for presentation + 5 mins for Q&A. Please prepare your talk in ppt or pdf, to be shown in my computer if possible. Each group will get one grade (15% of your total grade), with the following criteria:

- Clarity and logic of goals and approaches (5%)
- Technical rigor (5%)
- Success in soliciting interest and question answering (3%)
- Team responsibility delegation (2%): best: equally delegated; worst: one-man work