

# CIS 4930/6930, Spring 2015

## Experiment 2: Mobile Simulations

Due Date: April 14, 8:45am (beginning of class).

The goal of this experiment is to familiarize you with a mobile network simulator, and to get you to use it to analyze protocol's performance due to various parameters, such as mobility.

You are free to choose one of the simulators discussed in class, mainly during the workshop, including ONE, Omnet++, NS-3, NS-2, VanetMobiSim, Sumo, or a meaningful combination thereof. You can use another if you want after consulting with the instructor. [Mongoose does not seem to be available at this time]. [There is a post from Mimonah, Rohit and Satya about several simulators and pointers to the simulation packages on the Google+ Mobile Networking Discussions group].

You can also choose mobility models and protocols that you may be using for your project, allowing you to benefit from this experiment directly for your project report.

1) Choose *two* different mobility models, and compare *two* different routing protocols/algorithms using those two models. Plot your results, and explain them. Why does one routing protocol outperform the other using the same mobility model? Why does the same routing protocol perform different/same using the different mobility models?

2) Choose *one* simulation scenario from (1), and use the same mobility model and routing protocol but change three different simulation parameters. For example, change the pause time, area, speed, number of nodes. Run the simulator and compare the result and explain why it is similar or different.

3) Develop worst-case and best-case mobility test scenarios for the protocols you have used. Argue as to why your tests constitute the worst or best cases. Comment on your answer.

---

## Experiment III: CIS 4930/6930, Spring 2015

### **Experiment 3: Mobile Implementation**

Due Date: April 14, 8:45am (beginning of class).

The goal of this experiment is to familiarize you with mobile computing/networking implementation, and to get you to use it to analyze mobile protocol and/or algorithm performance in various situations.

You are free to choose a common mobile platform (Android, iOS) to elaborate on an implementation of a mobile algorithm or protocol of your choice. Examples include, but are not limited to: Bluetooth scanning and/or connection, activity recognition, ad hoc connection, location-based services and/or geo-fencing, or other mobile sensing, query, computation or networking.

You can choose a mechanism that you are already planning to use for your project.

Answer the following:

1) Describe your protocol/algorithm and its mobile implementation. Describe the testing/evaluation environment.

2) Choose two different metrics/measures of performance in addition to power consumption. Evaluate your implementation with respect to those three metrics. Generate the results (in tables, or plotted graphs) and comment on these results.

3) Vary your implementation to achieve potential improvement in one (or more) of the above metrics. Discuss the trade-offs in your improvement and discuss the effect of improving one metric on the other metrics.

4) Develop worst-case and best-case mobility test scenarios for the protocols you have used. Argue as to why your tests constitute the worst or best cases. Comment on your answer.