CSci 8980, Spring 2015

Take-home Midterm

This exam is due Friday March 5, at 12 noon. Please bring a printed copy of your answers to my office 4-225F KH (you may place the exam under my door). You may not collaborate or interact with your classmates or anyone else AT ALL. You may consult only myself and access material on the class website, your notes, anything mentioned in this exam, and within the papers we’ve read. No other sources (incl. Internet sources) or other papers are permitted. The total solution length should be in the 3-5 page range and appear as a professional formatted document. You may check the Announcements part of the class web page for any clarifications during the exam window.

1. Outsourcing:
Mobile agents are a form of outsourcing where specialized code is dispatched into the network to work on behalf of a client. Such code can move from server to server. Imagine that such an agent could perform specialized data processing on behalf of a mobile device for data that exists at a server. Explain specifically how such an agent could benefit the mobile user? What are the potential problems? For some background on mobile agents, consult: mobile agent paper.

2. Crowd Sensing:
One of the difficulties with crowd sensing is how to ensure that the sensed data is correct, that is, it represents an accurate measurement. Describe how you might design a solution to this problem. Present the pros and cons of your approach.

3. Privacy:
We have talked about the issue of mobile privacy in the event that data or computation are outsourced. To date, solutions appear to be limited. Either nothing is private, or the user has to opt-in for every data transfer, or everything is private. Describe a different solution to this problem that you believe has better properties. Better can be more flexible, more private, more efficient, etc. Compare your approach to the opt-in approach listed above. What are the advantages and limitations of your approach? You may illustrate your approach using a single type of data or application if you wish.

4. Be creative:
Suppose the cloud has learned a mobile device user’s patterns of activity – the web sites they visit, the apps they run, the data they collect (e.g. turning on the mic, taking a picture, etc.), the people they electronically interact with, based on location, day of the week, and time-of-day. Further, suppose that the cloud can also know when the user’s device is plugged in or not, and when it is able to use Wi-Fi. Suppose further that the cloud knows this information for a large number of users, and has knowledge of the user’s social network. Describe how the cloud can optimize the mobile user’s experience. You may answer this in any way you choose. One way would be to focus on metrics, another way could be to think about the kinds of applications that would be possible.