CSCI 5900: Advanced Mobility and Cloud Computing, Spring 2012

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Course Overview

We will offer again in partnership with Microsoft Research, Project Hawaii in spring 2012 this multidisciplinary course aiming to explore the potentials of future mobile and cloud computing and their interplay. We will discuss such potentials from technical, economical, security and social aspects. Microsoft will support the course with Windows Phones and several cloud services, such as existing Microsoft offerings and some prototype services including Windows Azure for computation and data storage, Bing Maps for mapping services, and Windows Live ID for user identification, support location awareness and notification. Of course the course will be open to other mobile and cloud platforms. The students will have a unique opportunity to combine theoretical knowledge with hands-on practice.

Besides multidisciplinary lectures and discussions of the latest research works, one of the most interesting aspect of the course implemented in spring 2011 were the projects developed and implemented by students using smartphones and cloud computing resources. The wide range of very interesting projects developed personal, financial and software automating tools; healthcare utilities; games; security devices and many others. Some of these works are submitted as research papers for publication in professional conferences and journal.

Mobile phones, originally conceived as purely for communication, are now transitioning to smart mobile devices that integrate mobility, communication and computation. Furthermore, several billions of such devices are being connected to the Internet. At the same time cloud computing is offering a paradigm shift in Internet computing. The combination of all such technologies opens unlimited opportunities for new services, but also brings many new questions, such as:
How are mobile services built?
What quality of service will be required?
How will the services be offered?
How to design services such that they are both economically viable and secure?
What are the social effects of such mobile services?

Course Topics
The course will be a combination of lectures and paper presentations on mobile, cloud computing and their security; invited lectures on viable economic models for mobile-cloud services and on their social effects. Some topics to be covered are:
- Introduction and background in mobile and cloud computing.
- Mobile phones, applications, localization
- Naming, addressing, routing and mobility
- Applications in various fields and their social effects.
- Security and privacy issues in mobile and cloud computing
- Economics of mobile and cloud computing

Grading
Presentations (20%): Each student will present 1-2 papers from a selected reading list.
Class discussions (20%). Each student should be prepared to discuss in class. Project (60%): In the course project, a student (or teams) will be required to develop a mobile application or system that uses the cloud or the Internet infrastructure in an interesting and novel manner. Furthermore, the security, economic viability and the potential social impact of the developed application should be included in the project.