TCN-6275 Mobile Computing

Catalog Description
Enabling technologies and impediments of mobile computing. (3 credits)

Prerequisites
Graduate Standing / permission of the instructor.

Type
Required for MSTN

Course Objectives
The course explores enabling technologies and impediments of mobile computing Cellular systems are described in multiple generations (2G, 3G, 4G) including emerging fifth-generation, providing a range of mobility management solutions. Impediments of the mobile environment will be covered. The course also explores research issues in pervasive computing and its close relative, ubiquitous computing. It examines a young but rich body of exciting ideas, solutions, and paradigm shifts. Many traditional areas of telecommunications, networking, computer science and engineering, information technology and others are impacted by the constraints and demands of mobile and pervasive computing including but not limited to energy management. Hence problems and limitations due to such impediments will be explained. We will review recent literature in each of these categories and will identify problems that we will attempt to solve. The course will be to understand the literature, define new problems, provide solutions, and finally provide evaluation of the solutions. The objective of the course is threefold: (1) expose you to important prior results in the field. (2) illustrate current trends, advancements and future direction (3) give you practical experience in the area through the design and execution of a modest research project.

Topics include mobile networking, personal communication systems, smart devices, and mobile applications

Topics
1. Introduction
2. Research Road Map
3. Constraints and Demands of Mobile Computing
4. Emerging mobile computing paradigms
5. Personal Communication Systems
6. 2.5 Generation Cellular Systems (GSM)
7. Mobility Management
8. Location Tracking Systems
9. Evolution to 3G, 4G systems (UMTS, LTE)
10. 5G Cellular Systems
11. Wireless networks and location management
12. Ad-hoc networks
13. Security issues in mobile ad-hoc networks
14. Pervasive/Ubiquitous Computing
15. Case Studies
16. Emerging Standards

Textbook
This course has no textbook; instead, we will cover a number of original research papers. It is very important that you read and digest each paper. The class website contains links to references and other material that will help the student digest the material presented in class.

Last Update
Dr. Niki Pissinou 9/1/2012