Wireless Internet and Pervasive Computing

This course covers the design principles and applications of wireless Internet access technologies, pervasive computing device architecture, network security features for mobile E-commerce, and development of information appliances in digital society applications. Important topics covered include 2.5G and 3G digital cellular radio technology; WAP, Bluetooth, IrDA, and wireless LAN (IEEE 802.11); wireless and media gateways; mobile devices architecture, OS, and software tools; smart phones, smart cards, PDA, and handheld computers; IPSec, PKI, IDS, and firewalls for Internet/Intranet security; UPnP and JINI for service discovery in ad hoc networks; Java, cluster computing; metacomputing grids; and middleware for pervasive and Internet computing.

Prerequisite: EE 450 (Introduction to Computer networks) or equivalent course

Course Syllabus: (Topics in order of 14-week lectures, 2 lectures per week)

1. Networking Technologies and Security Issues
2. Intrusion Detection and Response Systems (IDS, IRS)
3. Firewalls Architectures for Host and Network Security
4. Public-Key Infrastructure (PKI) and Interoperability
5. 2.5G and 3G digital Cellular Radio Technology
6. Wireless application protocols (WAP) architecture
7. Wireless LAN (IEEE 802.11) and Ad Hoc Networks
8. Pervasive Services Discovery (UPnP and JINI)
9. Smart Phones, Java cards, and Smart cards, etc.
10. Handheld Computers, PDA, and Mobile Devices
11. Palm OS and Middleware for Pervasive computing
12. IPSec, SSL, Kerberos, and AAA Security Systems
14. SAN, Gateways, WPKI, and Recent Advances
Required Textbooks:

Two books are required as listed below. In addition, we will cover handout material selected from published papers, technical reports, and Web sites of leading research centers.


Grading Policy and Class Procedures:

1. This is a research-oriented course. You need a good background in computers and networks to take the course with a rewarding experience. I will give you a diagnostic test at the very first lecture to determine your proficiency. Based on the test results, you will be advised on the second lecture to take or to withdraw the course. The course grade will be determined by five aspects: lecture attendance (10%), class-note documentation (15%), individual study written report (35%), team project written report (30%), and final project presentation (10%). There are no homework drills, no in-class exams, or any other additional requirements.

2. The class notes will be documented and put on the class web page by 26 note-taking groups in 26 lectures, 2 or 3 students per group. Each lecture note must be typed in a Word document of about 5-10 pages and submitted by E-mail attachment to the TA within one week after the lecture date. The notes must be well documented with figures, tables, illustrations, and one page of reference listing. You must provide at least 4 web links of key referenced papers or technical reports, that are most relevant to the two lectures your group has documented. Those web links will be posted on the class web page by the TA within two weeks after the lecture. Every student can down-load the notes and references for their purpose.

3. Individual study report will be counted as the mid-term grade. It will be collected at the 9-th week on **Oct. 24, 2002**. A list of topics will be handed out shortly for you to select from. The individual report will be limited to 20-25 pages in a word document. Follow the same format of the handout paper by Tanachaiwiat, et al, including original written text, figures, tables, and updated reference listing. Hard copies of two most recent and relevant references that are published in 2000-2002 must be attached as Appendices in your report. The Web links of the attached references must be given in the reference listing as well.

4. The final team project will be related to network security. It will be done by groups of 6-8 students per team. This will be a computer simulation project, requiring some programming and benchmark experiments on the Trojan cluster we have built on campus. The Team Project description will be handed out in the 5-th week. The final report will be due the 14-th week on **Nov. 26, 2002**. In addition to the Final Project Report (about 25-30 pages and weighted 30%), each group must give a 20-minute PowerPoint presentation (weighted 10%) of their research findings in the last week (Dec. 3 and 5, 2002) before the final-exam week. Presentation schedule of all groups will be announced later.

5. Visit the class Web page: [http://www-classes.usc.edu/engr/ee-s/599h/](http://www-classes.usc.edu/engr/ee-s/599h/) frequently to check any news announcement and supplement material posted. Email is the best way for you to contact the Prof. Hwang or the TA. We reply Emails on the same day. First check with the TA on any problems associated with class note taking, individual reports, and final project reports, before you come to see Prof. Hwang during his office hours.