

CPE 592

Multimedia Network Security

Instructor

Siva Somasundaram

Course Description:

While there has been lot of activity in “information security” this course deals with the notion of “information insecurity!” The objective of this course is to analyze and test current multimedia storage and communication networks for security loop-holes. Both wired and wireless networks will be considered. The course is designed to emphasize practical aspects of multimedia security along with relevant theory and software tools. Students will be expected to implement algorithms and perform experiments with different attacks and counter-measures. Secure storage and transfer of audio, image, and video data will be the focus of this course.

Course Syllabus:

Following is the projected course syllabus. Basic introduction to encryption and steganography, digital signatures, authentication, IP security, digital watermarking, covert communications, security issues related to multimedia protocols, hacking, and jamming. Applications such as security features in multimedia compression standards like MPEG-4, secure media streaming, wireless multimedia networking, copy control, and copyright protection applications will be discussed.

Pre-requisite :

Basic C/C++/MATLAB programming and working knowledge of probability. If you do not the pre-requisite, permission to register for this course can be obtained with the consent of the instructor.

Student Assessment:

Homework assignments (programming and theory): 20%, Three mid-term exams : 60%, Final Project : 20%.

Other Points:

1. Homework must be done individually.
2. Final project will focus on the security issues in state-of-the-art multimedia protocols, applications, and systems (wired and mobile wireless). This can be done in groups (max. 3 per group).
3. A list of projects will be given. Each student can choose one from this list on a first-come-first-served basis or choose one on their own with the consent of the instructor. A written report of the project is expected at the end of the semester with contributions of each member in the team made clear. Grades for the project will be based on criteria such as innovativeness, presentation/organization of project report, and completeness of implementation.
4. Currently there is no single book that deals with the goals of this course. Notes and articles given in the course website will be the basis of this course. References to articles from journals and magazines will be extensively used.
5. Knowledge in C and/or MATLAB will be assumed. Knowledge of basic probability will also be assumed. Course is open to graduate students and senior level undergraduates interested in information insecurity and want to have fun analyzing the insecurity of information systems.

Reference Texts :

Digital Watermarking, I.J. Cox, M.L. Miller, and J.A. Bloom, Morgan Kaufman Publishers/Academic Publishers, 2002.

Information Hiding: Steganography and Watermarking-Attacks and Countermeasures, N.F. Johnson, Z. Duric, and S. Jajodia, Kluwer Academic Publishers, 2000.