Brooklyn College
Department of Computer and Information Sciences

CISC3645 [50.1] Multimedia Security

3 hours; 3 credits

Information security objectives: confidentiality, data integrity, authentication, non-repudiation. Overview of cryptography and watermarking. Technical measures: conditional access systems for satellite, cable and terrestrial television networks; digital rights management systems for the Internet; copy protection systems for digital home networks. Legal measures: intellectual property protection, international treaties and national laws. Selective encryption for multimedia data. IP multicast security. Security of wireless LANs.

Syllabus:

1. Intellectual property protection
2. Copyright industries
3. Information security objectives: confidentiality, data integrity, authentication, non-repudiation
4. Overview of cryptography
    a. Classification of ciphers
    b. Types of authentication
    c. Digital signatures
5. Overview of watermarking
    a. Requirements for a watermarking scheme
    b. Classification of watermarking schemes
    c. Common attacks
6. Conditional access (CA) systems for satellite, cable and terrestrial television networks
7. Digital rights management (DRM) systems for the Internet
8. Copy protection (CP) systems for digital home networks
    a. DVD protection
    b. Digital interface protection
9. World Intellectual Property Organization (WIPO)
10. U.S. laws for copyright protection
11. Selective encryption for multimedia data
12. IP multicast security in wired networks
13. IP multicast security in wireless networks
14. Security of wireless LANs

Bibliography:

1. A. J. Menezes, P. C. van Oorschot, and S. A. Vanstone, Handbook of Applied Cryptography, CRC Press, 1997.

2. B. Schneier, Applied Cryptography, John Wiley and Sons, Inc, 1996.

3. I. J. Cox, M. L. Miller and J. A. Bloom, Digital Watermarking, Morgan Kaufmann Publishers, 2001.

4. S. Katzenbeisser and F. A. P. Petitcolas (Editors), Information Hiding Techniques for Steganography and Digital Watermarking, Artech House, Inc., 2000.

5. F. Halsall, Multimedia Communications, Addison-Wesley, 2001.

6. K. R. Rao, Zoran S. Bojkovic, Dragorad A. Milovanovic, Multimedia Communication Systems, Prentice Hall, 2002.

7. R. Steinmetz, K. Nahrstedt, Multimedia Fundamentals, Prentice Hall, 2002.

8. M. Arnold, M. Schmucker, S. D. Wolthusen, Techniques and Applications of Digital Watermarking and Content Protection, Artech House, 2003.

9. Mark S Drew, Ze-Nian Li, Fundamentals of Multimedia, Prentice Hall, 2004.

10. The Digital Dilemma: Intellectual Property in the Information Age, National Research Council, the National Academy Press, 2000.