ECE 624 Multimedia Systems

Outline:

1. Introduction to multimedia applications in business, education, manufacturing, CAD/CAE/CAI, medicine, entertainment, etc. Case studies of various existing multimedia and digital library projects. **(1.5 Weeks)**

2. Multimedia Database Management (Logical Modeling). Spatio-temporal synchronization requirements and models. Image, video and audio databases management. Conceptual modeling for object composition using Petri-nets, XML, and object-oriented paradigm. Semantic Modeling of video data. Multimedia query languages. Multimedia information security. Case studies of some existing multimedia database systems. **(2.5 Weeks)**

3. User Interface, tools and methodologies. User functions such as browsing, visualization, panning, zooming, object editing. Interface standards. Multimedia query languages. Case studies. **(1.5 Weeks)**

4. Multimedia Database Management (Physical Management) and OS support for real-time multimedia communication. Assessment of various storage technologies. Issues in physical layout of multimedia data. Data compression algorithms. Performance requirements for I/O subsystem and operating system. Video server design. **(1.5 Weeks)**

5. Broadband multimedia communication. Communication requirements for real-time multimedia traffic, videoconferencing. End-to-End Quality of Service requirements and adaptation. High speed network architectures. Broadband technology for wide and local area networks. Stream synchronization. Multimedia Transport Protocols, TP4, RTP, IPv6. Middleware design. Multimedia connection management and resource allocation for ATM, Internet, wireless, ad hoc and sensor networks. Performance evaluation. Case studies of various experimental networks. (**5 Weeks)**

5. Distributed multimedia systems. Distributed object management. Coordination Architectures, Real-time information distribution, fusion and spatio-temporal composition. Performance considerations and trade-offs. **(2 Weeks)**

7. Test and Presentation of Term Papers. **(1 Week)**