San Diego State University

Spring 2015

Course Number and Title: CompE665: Multimedia Wireless Networks

Catalog Description: Multimedia source characteristics, bitstreams, error resiliency, quality of service, video telephony, multimedia QoS-aware WLAN, peer to peer networks, cross layer design, multimedia broadcast multicast services, role of processing and power consumption.

Credits: 3

Prerequisites: Computer Networks (CompE560) or Multimedia Communication Systems (CompE565).

Instructor: Dr. Sunil Kumar, Office: E202A, Tel. 619-594-7012, Email: skumar@mail.sdsu.edu

Class Schedule       MW 4:00 – 5:15 pm, GMCS-308
Office Hours         MW 3:00 – 4:00 pm and TTh 4:00- 5:00 pm (for other times, please send email for appointment)

Course Learning Outcomes:
- Learn multimedia source characteristics for generating acceptable quality at the receiver end.
- Develop an understanding of the bitstream characteristics of network-friendly H.264 video standard.
- Learn the error resiliency schemes and their impact on Quality of Service.
- Learn mutual relationships and dependencies between source characteristics, compressed bitstreams, error resiliency and network protocols.
- Develop an understanding of cross layer design of wireless network protocols to support diverse QoS-needs of multimedia traffic, in the light of unreliable nodes and links, limited processing capacity and power constraints.

Textbook(s) and References:
- Research Papers and Lecture Notes distributed by the Instructor.

Topics Covered:
- Introduction to multimedia source characteristic: CBR, VBR, Loss tolerance, delay sensitivity, different bandwidth requirements.
• **Error resiliency**: Study of various error resiliency schemes for loss-tolerant transmission of multimedia data in the presence of bit and packet errors.

• **Quality of Service Issues**: Study of various QoS issues pertaining to the user requirements, source characteristics, application and other networking layers.

• **Video Telephony**: EVDO and 3G video telephony, QoS, packet scheduling, user satisfaction.

• **Multimedia QoS-aware WLAN and Ad Hoc and Peer to Peer Network Protocols**: Cross layer protocols to support diverse QoS-needs of multimedia traffic.

• **Multimedia QoS-aware Wireless Network Protocols**: Cross layer protocols to support diverse QoS-needs of multimedia traffic, in the light of unreliable nodes and links, limited processing capacity and power constraints.

**Grading**: There will be a large, class project that will account for 30% of the course grade. Each group will submit separate IEEE conference paper style reports at the end of the course.

  - Class Project: 30%
  - Midterm: 35% (March 18, closed book/notes)
  - Final exam: 35% (May 11, 3:30-5:30 pm, closed book/notes)
  - Bonus: 5% (for participating in the class-room discussions during lecture)

Written request for regrading the homework and exams must be submitted during the class on the same day they are returned.

**Missed Exams**: Missed exams can be made up only under unavoidable circumstances. Please see the instructor as soon as you know you will be unable to attend an exam. Make-up exams will be given by prior arrangement only.

**Plagiarism**: There is strong penalty for cheating and plagiarism in home assignments and exams. Please see SDSU policy for details on cheating and plagiarism.

The use of laptops and other electronic gadgets is not permitted during lectures.