

LANE DEPARTMENT OF COMPUTER SCIENCE AND ELECTRICAL ENGINEERING
CS 558 Multimedia Systems
Fall Semester 2006

Instructor: Don Adjero
Room ESB 937
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Office Hours: Tuesday 10:00 – 11:30am; Wednesday 9:00– 10:30am.

Course Schedule: Tuesday and Thursday 5:00-6:15pm, Rm. ESB G84

Course web site: <http://www.csee.wvu.edu/~adjero/classes/cs558/>

Purpose

Multimedia is concerned with the digital representation, manipulation and communication of various types of data – text, images, graphics, audio and video. One motivating factor in incorporating multimedia data in modern-day information services is the overall improvement in the quality of the information delivered to the user. However, the storage, transport, retrieval, integration and presentation requirements of multimedia data differ significantly from those of traditional data types. The difference is primarily due to the spatio-temporal constraints imposed by multimedia data, the need for simultaneous consideration of different media types, and the subjective nature of multimedia data.

This course will provide an introduction to the general problems posed by the use, manipulation and transport of multimedia data in traditional computing and communication platforms. At the end of the course, it is expected that students would have understood the special requirements needed in a multimedia computing environment and the various methodologies that have been used in an effort to meet these requirements.

Contents:

- ◆ Requirements and QoS: requirements in multimedia systems, QoS management
- ◆ Multimedia communications: multimedia transport, multimedia multicast, error resilience in multimedia transmission
- ◆ Image and video processing for multimedia: image/video analysis and techniques for multimedia systems
- ◆ Multimedia data compression and standards: audio, image, and video compression techniques, compression standards
- ◆ Multimedia information systems: indexing, retrieval, and searching; multimedia databases, digital watermarking
- ◆ Information networks

References:

Recommended texts:

1. Lu G., *Communication and Computing for Distributed Multimedia Systems*, Artech House, Norwood, Massachusetts, 1996.
2. Gonzalez R. C. and Woods R. E., *Digital Image Processing*. Addison-Wesley Publishing Co., Reading, Massachusetts, 2001.

Others:

1. Raghavan, S. V. and Tripathi, S. K., *Networked Multimedia Systems: Concepts, Architecture and Design*, Prentice Hall, 1997
2. Papers and other reference materials to be provided on need basis

| Assessment | Important Dates (Estimates) |
|---|--|
| Two Assignments: 25% (each 10%) Student Project : 25% Student Seminar : 20% Final Test : 30% | Assign. 1: Sept. 25, 2006 (due 2 weeks after) Projects : Oct. 2 (due: wk of Dec. 4, 2006) Assign. 2: Oct. 23 (due 2 weeks after) Seminar : From Nov. 13, 2006 Finals (comprehensive): Dec. 16, 2006 |

Grade Assignment

A: ≥ 85 ; B: 75 – 84; C: 65 – 74; D: 50 – 64; F < 50

Others

Academic Honesty

Students are encouraged to discuss class topics and analyze problems among themselves. However, copying assignment solutions or written reports (or parts of) is strictly forbidden. Also, while the Internet could be used as a research tool, copying materials verbatim from the Internet is plagiarism, and will not be tolerated in this class. Please, be aware that your submitted materials may be compared with each other, or with materials from the Internet during the evaluation.

Social Justice Statement

West Virginia University is committed to social justice. I concur with that commitment and expect to foster a nurturing learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with Disability Services (293-6700).

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Weekly Course Schedule

| Week | Starting | Topic | Notes |
|-------------|-----------------|---|---|
| 1 | August 21 | Introduction Requirements in multimedia systems | |
| 2 | August 28 | QoS | |
| 3 | September 4 | Multimedia communications – introduction | |
| 4 | September 11 | Multimedia communications – multimedia traffic characterization; error-resilience | |
| 5 | September 18 | Multimedia communications – multimedia multicasting | |
| 6 | September 25 | Introduction to Image processing | Assign1: (due 2 weeks after) |
| 7 | October 2 | Multimedia data compression (introduction) | Project topics: (due week of Dec. 4) |
| 8 | October 9 | Image compression | |
| 9 | October 16 | Video compression | |
| 10 | October 23 | Multimedia information systems | Assign2: (due 2 weeks after) |
| 11 | October 30 | Multimedia information systems | |
| 12 | November 6 | Information networks | |
| 13 | November 13 | Student seminar and presentations | Student Seminars |
| 14 | November 20 | Recess – Thanksgiving break | |
| 15 | November 27 | Student seminar and presentations | Student Seminars |
| 16 | December 4 | DEAD WEEK Revision | Project reports due Revision |
| | | | Finals: Sat. Dec. 16, 2006 |

Note that the above represents only an estimate of the weekly schedule. The actual date/week that a particular topic is discussed, and the specific topic sequence could vary during the semester.