Multimedia Course Overview

Sistem Multimedia

Universitas Negeri Jakarta

MM Objectives

1. To provide an overview to the subject
2. To describe a number of fundamental concepts
3. To discuss the elements of multimedia systems
4. To explain the application of multimedia
5. To give a global structure of multimedia
   - Multimedia data representation
   - Multimedia data processing
   - Multimedia data compression
   - Multimedia data security
   - Multimedia data transmission
   - Multimedia mobile games
   - Multimedia human computer interaction
What is Multimedia?

- Multi- means many; much; multiple
- Medium means:
  - An intervening substance through which something is transmitted or carried on
  - A means of mass communication such as newspaper, magazine, or television

- Multimedia is the combinations of text, graphic art, sound, animation, video and other kinds of elements.
- When a viewer of a multimedia presentation is allowed to control what elements are delivered and when, it is interactive multimedia.
- Multimedia is an inter-disciplinary subject because it involves a variety of different theories and skills:
  - these include computer technology, hardware and software;
  - arts and design, literature, presentation skills;
  - application domain knowledge.

Overview of Multimedia Software Tools

- The categories of software tools briefly examined here are:
  1. Music Sequencing and Notation
  2. Digital Audio
  3. Graphics and Image Editing
  4. Video Editing
  5. Animation
  6. Multimedia Authoring
Multimedia Global Structure

Application domain — provides functions to the user to develop and present multimedia projects. This includes Software tools, and multimedia projects development methodology.

System domain — including all supports for using the functions of the device domain, e.g., operating systems, communication systems (networking) and database systems.

Device domain — basic concepts and skill for processing various multimedia elements and for handling physical device.

Multimedia and Computer Science:
- Graphics, HCI, visualization, computer vision, data compression, graph theory, networking, database systems. Multimedia and Hypermedia

- Multimedia involves multiple modalities of text, audio, images, drawings, animation, and video.

- Examples of how these modalities are put to use:
  - Video teleconferencing.
  - Distributed lectures for higher education.
  - Tele-medicine.
  - Co-operative work environments.
What is a Multimedia System?

A system that involves:
- generation
- representation
- storage
- transmission
- search and retrieval
- delivery
  of multimedia information

Multimedia Computing

- Multimedia systems involve some basic enabling techniques:
  - Multimedia data representation and compression.
  - Multimedia data processing and analysis.
  - Transmitting multimedia data through communication networks.
  - Multimedia database, indexing and retrieval.
Challenges of Multimedia Computing

- Developing a successful multimedia system is non-trivial.

- Continuous media types such as video need a lot of space to store and very high bandwidth to transmit.
- They also have tight timing constraints.
- Automatically analyzing, indexing and organizing information in audio, image and video is much harder than from text.
- Multimedia involves many different research areas and needs more complex and more efficient algorithms and hardware platforms.

Linear VS Non-Linear

**LINEAR**

- A Multimedia Project is identified as Linear when:
  - It is not interactive
  - User have no control over the content that is being showed to them.
- Example:
  - A movie
  - A non-interactive lecture / demo show
Linear VS Non-Linear

A Multimedia Project is identified as Non-Linear when:
- It is interactive
- Users have control over the content that is being showed to them.
- Users are given navigational control

Example:
- Games
- Courseware
- Interactive CD

Hypermedia and Multimedia

- A hypertext system: meant to be read nonlinearly, by following links that point to other parts of the document, or to other documents (Fig. 1.1)

- HyperMedia: not constrained to be text-based, can include other media, e.g., graphics, images, and especially the continuous media – sound and video.
  - The World Wide Web (WWW) — the best example of a hypermedia application.

- Multimedia means that computer information can be represented through audio, graphics, images, video, and animation in addition to traditional media.
Multimedia Application

- Digital video editing and production systems.
- Electronic newspapers/magazines.
- On-line reference works: e.g. encyclopaedia, games, etc.
- Home shopping.
- Interactive TV.
- Multimedia courseware.
- Video conferencing.
- Video-on-demand.
- Interactive movies.
- ........
Importance of Multimedia

- There are a number of fields where multimedia could be of use. Examples are:
  - Business
  - Education
  - Entertainment
  - Home
  - Public Places

Importance of Multimedia

- **Business**
  - Use and Applications
    - Sales / Marketing Presentation
    - Trade show production
    - Staff Training Application
    - Company Kiosk
Importance of Multimedia

**Education**
- Use and Applications
  - Courseware / Simulations
  - E-Learning / Distance Learning
  - Information Searching

**Entertainment**
- Use and Applications
  - Games (Leisure / Educational)
  - Movies
  - Video on Demand
    - Online
Importance of Multimedia

- **Home**
  - Use and Applications
    - Television
    - Satellite TV
    - SMS services (chats, voting, reality TV)

- **Public Places**
  - Use and Applications
    - Information Kiosk
    - Smart Cards, Security
Group Discussion