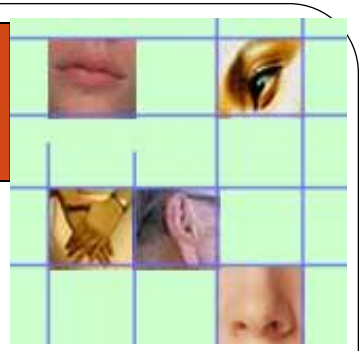
Introduction to Multimedia

What is multimedia?



- **Multi**: more than one
- **Medium** (singular): middle, intermediary, mean
- **Media** (plural): means for conveying information

- Media in the press, newspaper, radio and TV context - mass media
- Media in communications: cables, satellite, network – transmission media
- Media in computer storage: floppy, CD, DVD, HD, USB – storage media
- Media in HCI context: text, image, audio, video, CG – interaction media

Multimedia is a ***presentation of a computer application incorporating (دمج)media elements such as text, graphics, animations , audio, and video.***

What is Multimedia in terms of Computing

Computing: Computer-based technologies and applications

→ What computers? →Various forms of computers/devices!

In terms of computing, four fundamental multimedia attributes:

- Digitized: All media including audio/video are represented in digital format
- Distributed: The information conveyed is remote, either pre-produced and stored or produced in real-time, distributed over networks
- Interactive: When the user is given the option of controlling the elements of the multimedia project .
- Integrated: The media are treated in a uniform way, presented in an orchestrated way, but are possible to manipulate independently

Definition of Multimedia:

Computer-based techniques of text, images, audio, video, graphics, animation, and any other medium where every type of information can be represented, processed, stored, transmitted, produced and presented digitally.

Multimedia can be classified

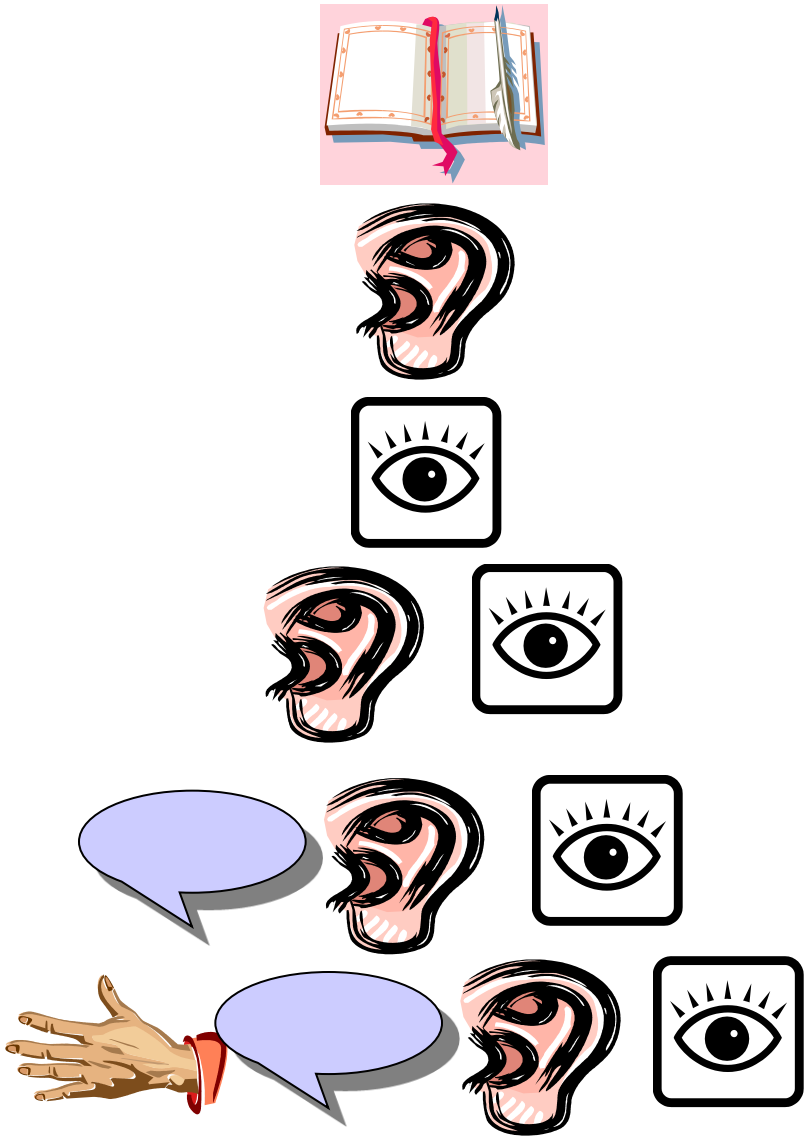
LINEAR

- 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

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

Benefits of Multimedia



10% of what they read

20% of what they hear

30% of what they see

50% of what they hear and see

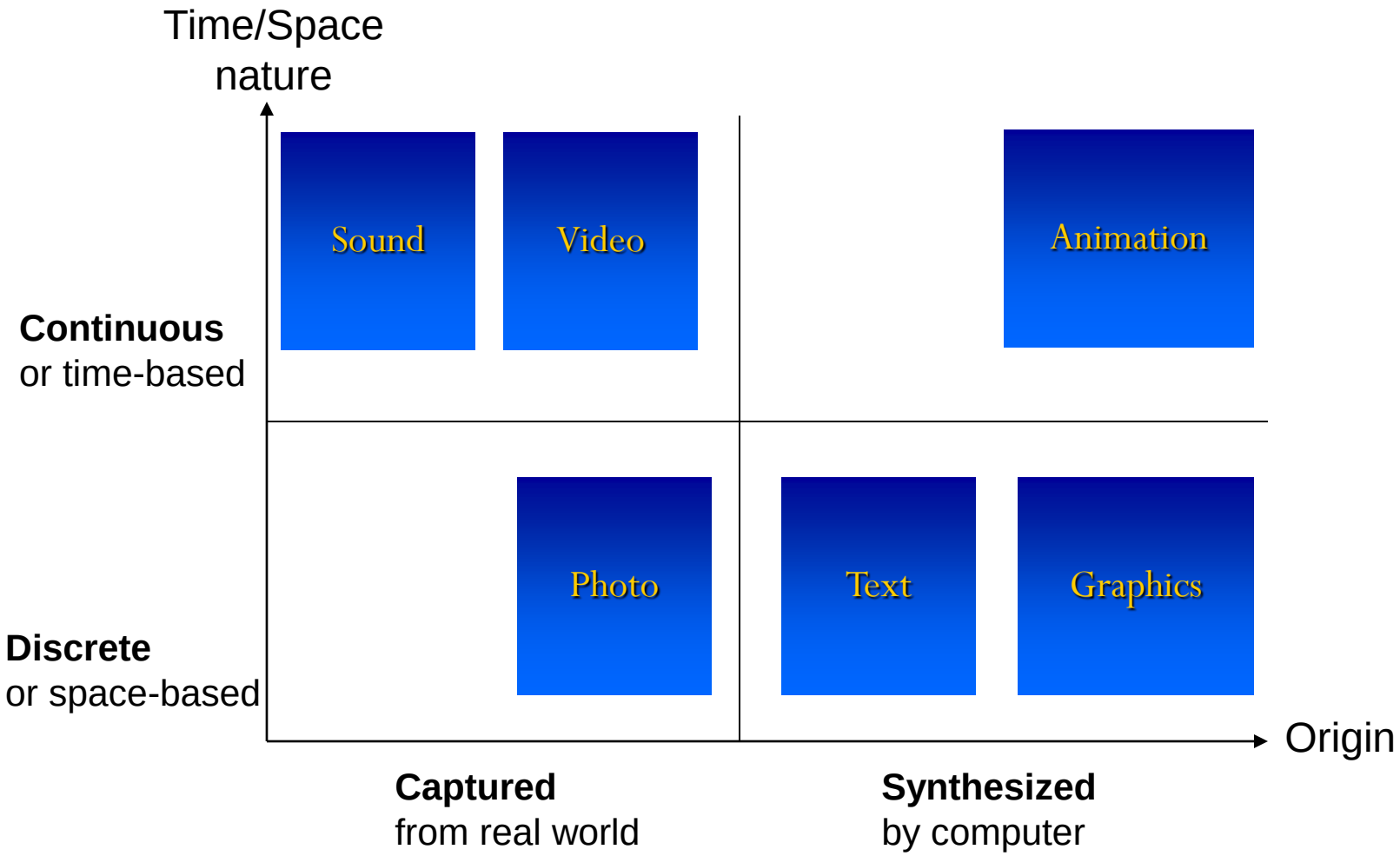
80% of what they hear, see and say

90% of what they hear, see, say and touch

What are the media components?

- Text - ASCII/Unicode, HTML, Postscript, PDF
- Audio – Sound, music, speech, structured audio (e.g. MIDI)
- Still Image - Facsimile, photo, scanned image
- Video (Moving Images) – Movie, a sequence of pictures
- Graphics – Computer produced image
- Animation – A sequence of graphics images

Classification of media types



Captured Versus Synthesized Media

- ***Captured media*** refers to information types captured from the real world (e.g. Still pictures, moving pictures, and sound).
- ***Synthesized (تأليف) media*** refers to information types synthesized by the computers (e.g. Text, graphics and computer animation).

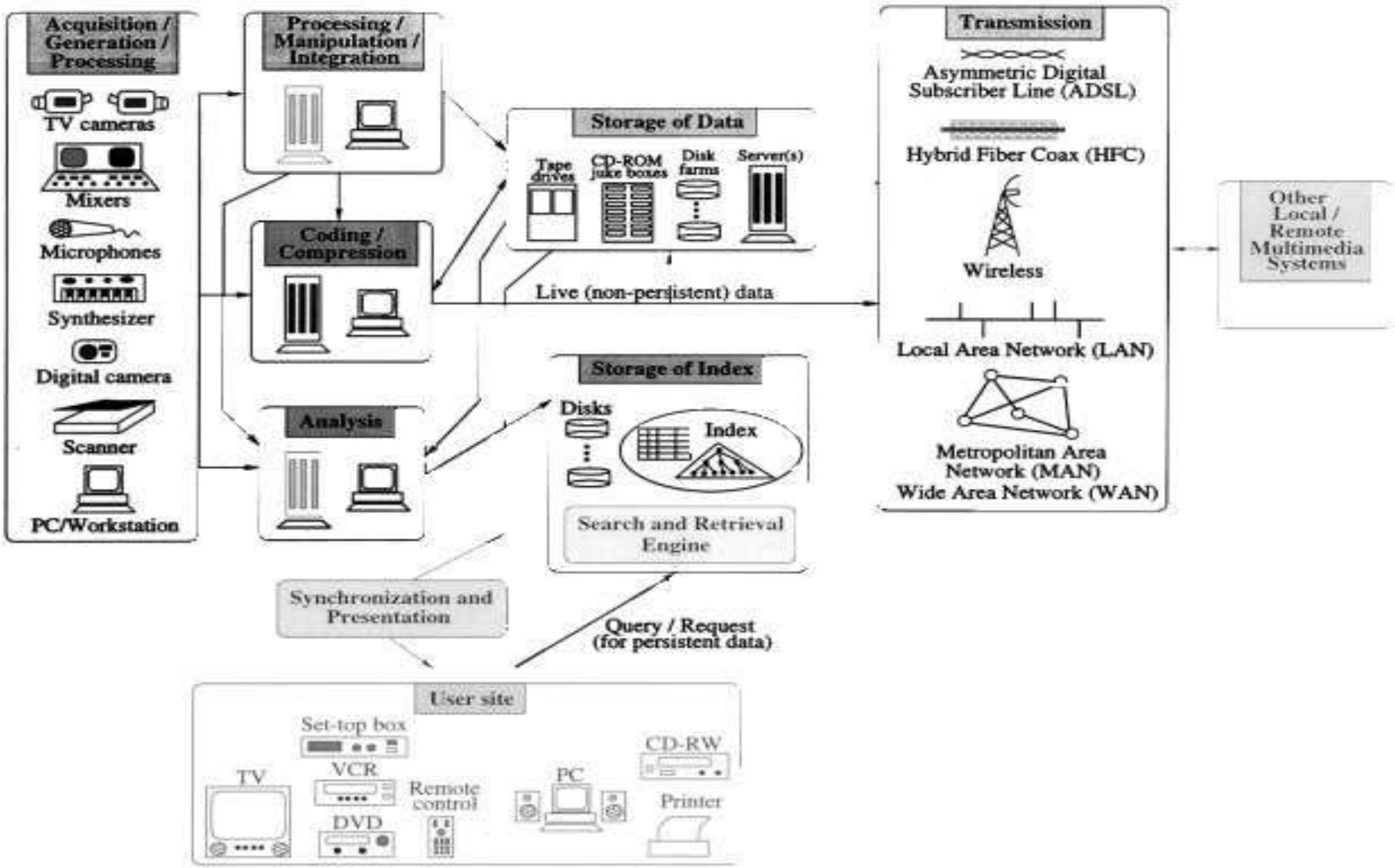
Discrete Versus Continuous Media

- ***Discrete media*** refers to media involving space dimension only (e.g. Still images, text and graphics). Discrete media is also referred to as static media or non-time-based media or non-temporal media or space-based media.
- ***Continuous*** (time based) media refers to time-based media (e.g. Sound, moving images, and animation). Continuous media is also referred to as dynamic media or time-based media or temporal media.

Characteristics of Multimedia System

1. They must be computer-controlled.
   User is able to view, hear, and see using a Multimedia PC System.
2. They are integrated.
   At least one discrete and one continuous media combined for information presentation
   design sharing
3. The information they handle must be represented digitally.
   Consists of various form of media i.e. text, graphics, audio, video, and animations; created, stored, processed, and transmitted DIGITALLY.
4. The interface to the final user may permit interactivity.
   User is able to navigate, interact, create, and communicate.

General Overview of a Multimedia System



Benefits of using multimedia in software

- Ease of use
  - User friendly, increase user's effectiveness
- Intuitive Interface
  - Allows user to determine functions of an application by their own intuition
- Immersive Experience
  - Software application takes over the entire computer screen, allows user to focus on application

Benefits of using multimedia in software

- Self-paced interaction and better retention

  - allows information processing at one's own pace

- Better understanding

  - simultaneous presentation of different media provides richer & broader range of information.

- Cost effectiveness

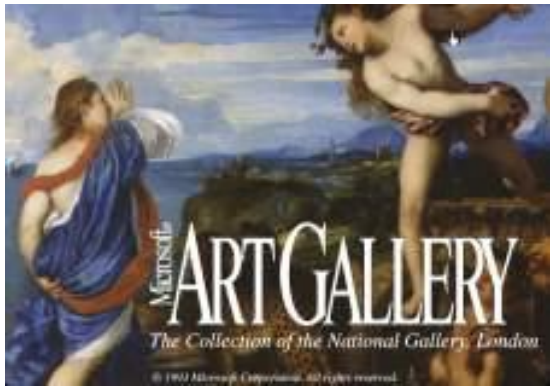
  - less training, less technical support

Problems with Multimedia

- **Investment (استثمار) costs**
  - multimedia involves high volume of content
  - expensive copyright and royalty
- **Technical barriers (accessibility issues)**
  - upgrade IT and PC infrastructure
- **Socio psychological barriers**
  - Generation gap
  - Learning rates
  - Learning in group/individual
  - Importance of teacher
- **Legal problems**
  - Copyright

Where to use multimedia ?

- Business
- Government
- Education
- Broadcasting and Entertainment
- Research and Development
- Health



Business

Interactive Multimedia Merchandising

- Online-shopping Kiosks
- Virtual shopping / home shopping

  http://www.thevirtualmall.co.uk/

Desktop Videoconferencing

- Due to the high cost of transportation and the large amount of employee time spent traveling to meetings, videoconferencing is on the rise.

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Multimedia Travel Systems

- These systems enable the travel agents to show their customers about where they will travel, what will be their accommodation like, and what they will be able to do at their destinations.

www.visitmalaysia.com.my

Real Estate

- Multimedia systems enable buyers to visit hundreds of properties virtually, view on screen photos of homes, inspect floor plans, see street maps, and study neighborhood demographics.

www.penangtimessquare.com

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Corporate Training

- Many corporations have used multimedia to reduce training cost and improve employee productivity.

Advertising and Electronics Brochures

- The electronic brochure is an advertising and marketing tool that usually consists of single diskette or CD-ROM sent to targeted audiences. Corporations are also beginning to offer shareholders annual reports on CD-ROM.

www.porsche.com

Government

Public Service Kiosks

- Multimedia kiosks convey public service information such as jobs and employment opportunities.
- City-info kiosks offer to citizens and travelers the ability to find information on addresses, points of interest, shops, restaurants, public transportation, hours of opening, guided tours, city transport info.

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Politics

- Multimedia in general and internet in particular are playing a big role in politics and virtual campaigning where every political candidate contesting in an election has a web site.

Consumer Information

- Multimedia based CD-ROMs are available which contains government information on a wide variety of topics: government forms, list of government offices in each state, tax preparation etc.

Education

Computer Aided Learning

- To assist student through simulation for better understanding such as volcano eruption, corrosion, language pronunciation, etc.

www.quiz-tree.com

Virtual Campus

- Learning takes place in a virtual classroom using video conferencing and online lecture so that students all around the world can attend.

Broadcasting and Entertainment

Electronic catalogue

- Product features and descriptions are advertised through web, CD and mobile devices.
- **Interactive Movie**
- Viewers can decide the direction of the plot of the movie and camera angle.

On-demand News or movies

- News, movies and TV series can be watched on demand through web and mobile devices.

http://soccernet.espn.go.com

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3D or animated movies

- Movies created through advance 3D technology and animation techniques.

Video Games

- Advances in the field of multimedia have led to more attractive video and computer games being available now in the consumer market.

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Virtual Reality

- Virtual Reality refers to the use of a computer to immerse the user into a simulated experience that it seems real. Virtual reality systems often use special hardware to enhance the experience, including visual displays.

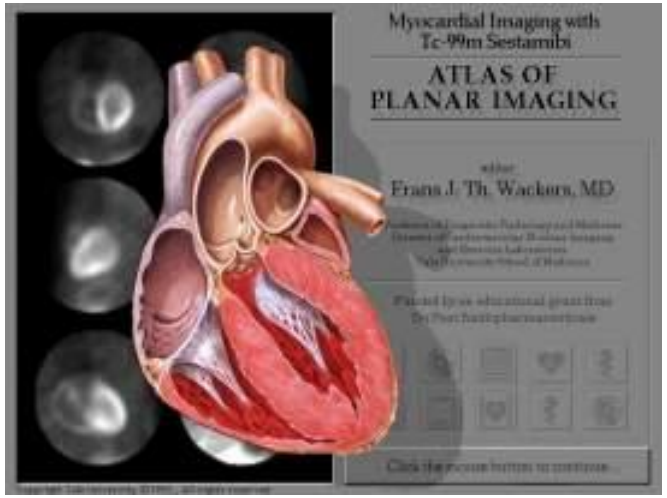
Cyber Sports

- Cyber Sports is the use of virtual reality to provide computer users with a realistic sports experience. Two new interactive virtual reality devices let you “Swing” and “Hit” balls at your PC.

Medicine

Virtual Surgery

- Virtual surgery authoring system has been created for producing surgical training simulation.
- Surgeons can use 3-D images created from magnetic resonance imaging (MRI) scans of the human body to practice complicated procedures such as brain tumor removal and reconstructive surgery.



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Video Conferencing and Image Retrieval

- The use of imaging techniques (X-Rays, CT, MRI etc) is growing in health care. The collection, maintenance, processing and distribution of these records can be significantly improved by using computer based storage and multimedia networking. Once these records are integrated with the on-line patient information and easily shared by both local and remote physicians, it results in a large number of benefits like reduced cost and improved care.

Multimedia Products

- **Briefing**

  eg: *corporate presentation, sales presentation and educational lectures.*

- **Reference**

  eg: *encyclopedias, dictionaries*

- **Database**

  eg: library system, phone directory

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- **Education and Training**

  eg: **-** *Instructor support products – Resource materials for instructors*

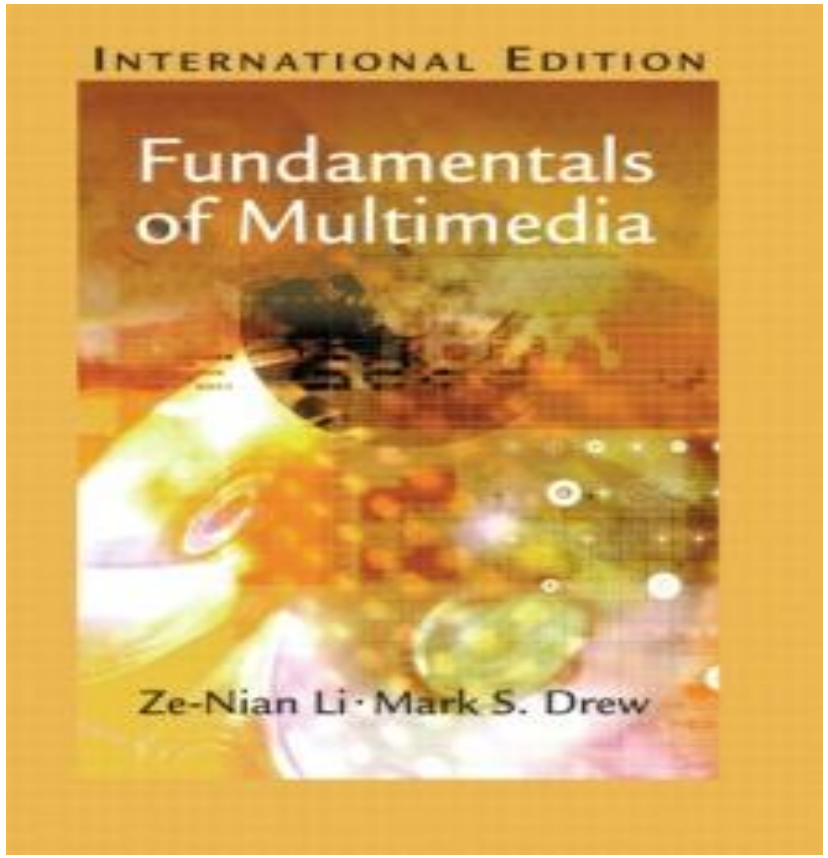
  - Standalone or self-paced products – Learning bmaterials for students to study at their own pace

- **Kiosk**

  eg: *bank machines, mall information centers.*

- **Entertainment and Games**

  eg: *computer games and movies.*


INTERNATIONAL EDITION
Fundamentals of Multimedia
Ze-Nian Li · Mark S. Drew