Intelligent Signal Processing

Introduction
to
Multimedia Systems

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Multimedia

- Multimedia literally means more than one medium

- Most people use the term Multimedia to mean a document containing two or more media and modalities
  - text
  - Images
  - drawings
  - graphics
  - animation
  - video
  - sound (including speech)
  - interactivity …

Multimedia content

- Multimedia content is

  - recorded and played

  - displayed

  - accessed by digital information content processing devices

    - smartphones, tablets, laptops, personal computers, smart TVs, game consoles

  - distributed by servers and datacenters

    - tapes, harddrives, disks, wired and wireless networks, …

Multimedia research topics

- Multimedia processing and coding
  - audio/image/video processing, compression algorithms, multimedia content analysis, content-based multimedia retrieval, multimedia security, and so on

- Multimedia system support and networking
  - network protocols, Internet and wireless networks, operating systems, servers and clients, and databases

- Multimedia tools, end systems, and applications
  - hypermedia systems, user interfaces, authoring systems, multimodal interaction, integration, multimedia education, collaborative learning and design, applications of virtual environments

Multimedia research topics

- Multimedia research touches almost every branch of Computer Science

    - For example data mining is an important current research area, and a large database of multimedia data objects is a good example of just what big data we may be interested in mining (e.g., telemedicine applications)

- Multimedia research is highly interdisciplinary

    - involving such other research fields as electric engineering, physics, and psychology

Requirements of Multimedia Kernels

- Multimedia applications often require levels of service from the operating system that differ from the requirements of traditional applications

  - Timing and rate requirements

- Tasks that request data at constant intervals are known as periodic processes

  - MPEG-1 video might require a rate of 30 frames per second during playback

  - a frame is delivered approximately every 3.34 hundredths of a second

QoS

- Rate requirements and deadlines are known as Quality of Service (QoS) requirements

- QoS must be guaranteed by
  - Operating Systems
  - Networking communications