

ICS371

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# ICS371

Multimedia Systems include:

- Multimedia Content
- Multimedia Computing
- Multimedia Communications
- Multimedia Applications

# Computer Requirements

- A multimedia system requires hardware and software.
- To deliver multimedia content the computer needs to fulfill a number of requirements:
  - Processor power
  - Graphics capability
  - Memory (primary storage)
  - Disk space (secondary storage)
  - Interface to audio and visual output devices
  - OS and application/player software

# Multimedia processors

- Since the mid nineties the market for computer processors with multimedia capabilities has grown exponentially.
- Multimedia processors have dedicated circuitry for playing back multimedia content.
- Processor architectures that support multimedia can be divided into:
  - Dedicated multimedia processors
  - General purpose multimedia processors

# Multimedia processors

Dedicated multimedia processors:

- These are specific chips that have media decoders onboard. Their job is to encode and decode audio and video (content).
- They are sometimes called Video Codecs.
- Examples are:
  - AT&T AV6110 MPEG-2
  - LSI Logic L64002 MPEG-2 decoder

Source: Handbook of Multimedia Computing by Borivoje Furht

- MPEG-2 is a standard for the generic coding of moving pictures and associated audio information.

# Multimedia processors

## General purpose multimedia processors

- General purpose processors are computer CPU's that provide support for multimedia content.
- They don't perform specific multimedia functions, but they are designed to support generic operations.
- Examples are:
  - Intel Pentium MMX (first multimedia PC CPU)

# Graphics capability

- Video cards function to generate and output images to a display.
- Some video cards offer added functionalities, such as video capture, TV tuner adapter, MPEG-2 and MPEG-4 decoding (using dedicated multimedia processors)
- A video card may contain a GPU - a dedicated graphics microprocessor optimized for floating point calculations which are fundamental to 3D graphics rendering.



# Memory (primary storage)

- Digital images, video and audio contain a huge amount of information.
- To retrieve, store and output multimedia in real-time requires that there is enough room to hold this information.
- Lots of memory (RAM) is required to provide uninterrupted playback of multimedia content.
- Most video cards have onboard memory to ease the burden on the computers main RAM.

# Disk space

- Unless the multimedia content is stored on a CDROM or DVD the computer will require somewhere to store the content.
- Multimedia content can take up large amounts of disk space.



# Interface to output devices

- A computer needs to be able to output its sound, video, motion etc to external devices such as speakers, monitors, joysticks etc.
- To do this a hardware interface is used.
- This piece of equipment is different for each output, but each of them converts the signals/commands from the computer into signals/commands that the outside hardware (speakers, monitors etc) can understand.

# Software

- In addition to the hardware a computer requires the software to play the content.
- The operating system must support the dedicated hardware and interface devices.
- The operating system must also run the software that plays or presents the content.
- Software is also required to instruct the OS or applications on how to interpret the content (codecs).

# Examples of Multimedia

Class Demonstration