

# Introduction to Multimedia Computing

Introduction

# Topics

- ▶ Media and Multimedia
- ▶ Media Types
- ▶ Course Syllabus
- ▶ Evaluation

# Media and Multimedia

- ▶ **Definitions:**
  - **Data:** is information that may be valuable for an end-user
  - **Media:** tools used to store and deliver information or data (e.g. Image to store/deliver visual data)
  - **Multimedia:** communications that include multiple forms of information

# Sample Media Types

- ▶ Text
- ▶ Image
- ▶ Graphics
- ▶ Animation
- ▶ Audio
- ▶ Video

# Text

- ▶ Any form of written material



# Image

- ▶ Images are two-dimensional data seen by people, such as a photograph, and screen display. They may be captured by optical devices such as cameras.



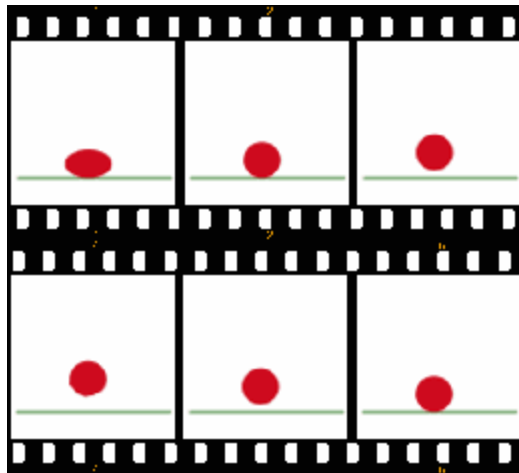
# Graphics

- ▶ Graphics are visual presentations on some surface, such as a wall, canvas, computer screen, paper, etc.



# Animation

- ▶ **Animation** is the rapid display of a sequence of 2-D images to create an illusion of movement





# Audio

- ▶ Audio is sound within the hearing range of humans. Audio frequency should be within the range of 20 to 20,000 hertz.

# Video

- ▶ Video is the technology that captures moving images electronically. Those moving images are in fact a series of still images that change so fast that it looks like the image is moving.



# Course Syllabus

## ▶ Introduction

- Introduction to Multimedia, Motivation and Applications
- Signals and Waves
- Analog and Digital Data
- Sampling and Quantization

## ▶ Audio

- Introduction to Digital Audio
- Representing Audio Data
- WAV Audio Format

# Course Syllabus

## ▶ Image

- Image Data Representation
- Color Models
  - RGB
  - YCbCr
- Main Image File Formats
  - Bitmap Files
  - Lossless Image Compression
    - Run-length Coding (pcx )
  - Lossy Image Compression
    - Cosine Transform Based Coding (jpeg)

# Course Syllabus

- ▶ Video
  - Video Data and the Need for Compression
  - Video Compression Standards
    - MPEG
    - H263
    - H264
- ▶ Streaming Multimedia over the Internet

# Text Books

- ▶ Multimedia Information Systems, Kluwer International Series in Engineering and Computer Science, Multimedia Systems and Applications. By: Angelides, Marios C.; Dustdar, Schahram. Published by: Springer Science & Business Media. ISBN: 0792399153
- ▶ H.264 and MPEG Video Compression, Video Coding for Next-generation Multimedia. By Iain E. G. Richardson, The Robert Gordon University, Aberdeen, UK. Publisher John Wiley & Sons Ltd, ISBN: 0-470-84837-5

# Assignments

- ▶ *Four research assignment from*
  - *Audio*
  - *Image*
  - *Video*
  - *Streaming Multimedia*

# Evaluation

- ▶ 4 Assignments (30%)
- ▶ Term Project (30%)
- ▶ Final Exam (40%)



# Questions?