Lecture No: 1 Chapter1: Fundamental of multimedia

1- Introduction

Multimedia means computer information that can be represented through text, graphics, images, audio, video and animation in addition to traditional media. **Video** can be considered as an **integrated Multimedia** because it contains all the components of multimedia (images, sound and text). **Frame** is any number of images in a time period (30 images per second), those images are similar (identical) in characteristics. A good definition for this field is:

Multimedia is the field concerned with the computer controlled integration of text, graphics, drawings, still and moving images (Video), animation, audio, and any other media where every type of information can be represented, stored, transmitted and processed digitally. **Digital multimedia** is any combination of two or more media, represented in a digital form, sufficiently well integrated to be presented via a single interface, or manipulated by a single computer program.

A Multimedia Application is an application which uses a collection of multiple media sources e.g. text, graphics, images, sound/audio, animation and/or video.

A Multimedia System is a system capable of processing multimedia data and applications and supports more than a single kind of media **Multimedia System** is characterized by the processing, storage, generation, manipulation and rendition of Multimedia information.

The development of powerful multimedia computers and the evolution of the Internet have led to an explosion of applications of multimedia worldwide. These days' multimedia systems are used for **education, in presentations, as information kiosks** (أكشاك المعلومات) [In information technology, a kiosk is a small physical structure (often including a computer and a display screen) that displays information for people walking by, and in the **gaming industry**. In fact, multimedia has applications everywhere: in businesses, at schools and universities, at home, and even in public places.

The word **multimedia** is a combination derived from **multiple and media**. The word medium (the singular of media) means a transmission channel. For example, sound is transmitted through the medium of air, or electricity is transmitted through the medium of wires.

Element of Multimedia

We have seen that a multimedia system consists of several elements such as images, sound, graphics, text, and video. We now describe what each one contains.

1-image

The digital image I (r, c) is represented as a two- dimensional array of data, where each pixel value corresponds to the brightness of the image at the point (r, c). in linear algebra terms , a two-dimensional array like our image model I(r, c) is referred to as a matrix , and one row (or column) is called a vector.

The image types we will consider are:

Binary image

Binary images are the simplest type of images and can take on two values, typically black and white, or '0' and '1'. A binary image is these types of images are most frequently in computer vision application where the only information required for the task is general shapes, or outlines information.

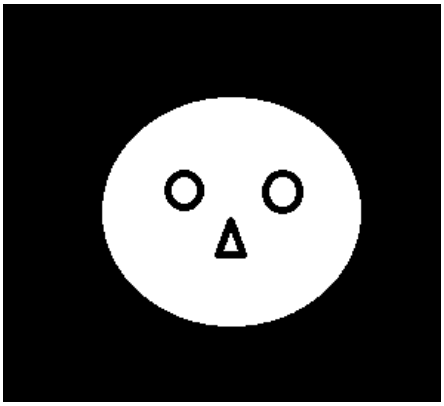

Figure 1 sample of binary image

Gray Scale image

Gray _scale images are referred to as monochrome, or one-color image. They contain brightness information only brightness information only, no color information. The number of different brightness level available. The typical image contains 8 bit/ pixel (data, which allows us to have (0-255) different brightness (gray) levels. The 8 bit representation is typically due to the fact that the byte, which corresponds to 8-bit of data, is the standard small unit in the world of digital computer.

Figure 2 sample Gray scale image

Color image

Color image can be modeled as three band monochrome image data, where each band of the data corresponds to a different color. The actual information stored in the digital image data is brightness information in each spectral band. When the image is displayed, the corresponding brightness information is displayed on the screen by picture elements that emit light energy corresponding to that particular color. Typical color images are represented as red, green, and blue or RGB images .using the 8-bit monochrome standard as a model, the corresponding color image would have 24 bit/pixel – 8 bit for each color bands (red, green and blue). The following figure we see a representation of a typical RGB color image.

Figure 3 sample of color image