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FACULTY OF ENGINEERING & TECHNOLOGY

BCS -504 Computer Graphics & Multimedia

Lecture-27

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OUTLINE

- **IMAGES & AUDIA**

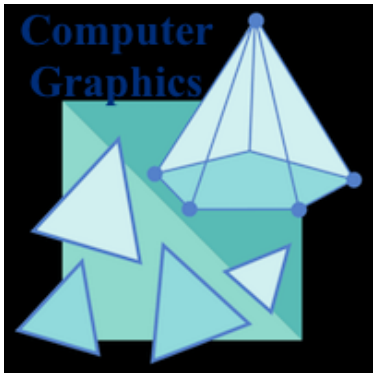
IMAGES AND AUDIO

What is an image in computer graphics?

An image is a picture that has been created or copied and stored in electronic form. An image can be described in terms of vector graphics or raster graphics. An image stored in raster form is sometimes called a bitmap. An image map is a file containing information that associates different locations on a specified image with hypertext links.

An image, digital image, or still image is a binary representation of visual information, such as drawings, pictures, graphs, logos, or individual video frames. Digital images can be saved electronically on any storage device. The following example image is a modified picture of a computer CPU with a heat sink

An image consists of a rectangular array of dots called pixels. The size of the image is specified in terms of width X height, in numbers of the pixels. The physical size of the image, in inches or centimeters, depends on the resolution of the device on which the image is displayed. The resolution is usually measured in DPI (Dots Per Inch). An image will appear smaller on a device with a higher resolution than on one with a lower resolution. For color images, one needs enough bits per pixel to represent all the colors in the image. The number of the bits per pixel is called the depth of the image.



Types of image in computer graphics

Common image file formats online include:

- JPEG (pronounced JAY-peg) is a graphic image file produced according to a standard from the Joint Photographic Experts Group, an ISO/IEC group of experts that develops and maintains standards for a suite of compression algorithms for computer image files. JPEGs usually have a .jpg file extension.

- GIF (pronounced JIF by many, including its designer; pronounced GIF with a hard G by many others) stands for Graphics Interchange Format. The GIF uses the 2D raster data type and is encoded in binary. GIF files ordinarily have the .gif extension.

- GIF89a is an animated GIF image, formatted according to GIF Version 89a. One of the chief advantage format is the ability to create an animated image that can be played after transmitting to a viewer page that moves - for example, a twirling icon or a banner with a hand that waves or letters that magically get larger. A GIF89a can also be specified for interlaced GIF presentation.

- PNG (pronounced ping) is a Portable Network Graphics) is a file format for image compression that was designed to provide a number of improvements over the GIF format. Like a GIF, a PNG file is compressed in lossless fashion (meaning all image information is restored when the file is decompressed during viewing). Files typically have a .png extension.

IMAGES AND AUDIO

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- SVG is Scalable Vector Graphics, the description of an image as an application of XML. Any program such as a browser that recognizes XML can display the image using the information provided in the SVG format. Scalability means that the file can be viewed on a computer display of any size and resolution, whether the small screen of a smartphone or a large widescreen display in a PC. Files usually have .svg extension.

- TIFF (Tag Image File Format) is a common format for exchanging raster graphics (bitmap) images between application programs, including those used for scanner images. A TIFF file can be identified as a file with a .tiff or ".tif" file name suffix.

2) A disk image is a copy of the entire contents of a storage device, such as a hard drive or DVD. The disk image represents the content exactly as it is on the original storage device, including both data and structure information.

3) Another use of the term image is for a section of random access memory (RAM) that has been copied to another memory or storage location.

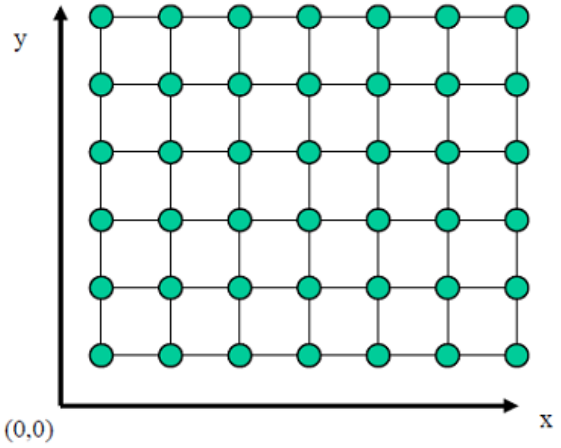
PIXELS

“Pixel is the smallest unit of a picture displayed on the computer screen.” A pixel includes its own:-

- Intensity
- Name or Address

The size of the image is defined as the total number of pixels in the horizontal direction times the total number of pixels in the vertical direction (512 x 512,640 x 480, or 1024 x 768). The ratio of an image’s width to its height, we can measure it in unit length or number of pixels, is known as the aspect ratio of the image.

For example– A 2 x 2inch image and a 512 x 512 image have an aspect ratio of 1/1, whereas a 6 x 4inch image and a 1024 x 768 image have an aspect ratio of 4/3.



RESOLUTION

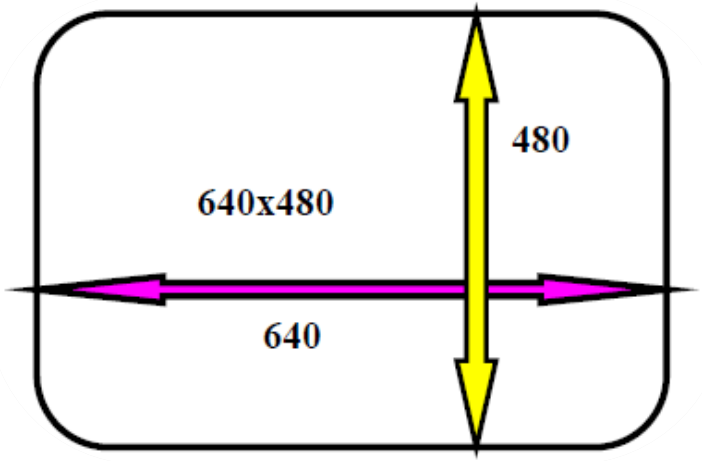
Resolution: It is the number of separate pixels display on a screen expressed in terms of pixels on the horizontal axis and vertical axis.The sharpness of the picture on display depends on the resolution and the size of the monitor.

“The number of pixels per unit is called the resolution of the image.”

It also includes-

- Image Resolution: “The distance between two pixels.”
- Screen Resolution: “The number of horizontal and vertical pixels displayed on the screen is called Screen Resolution.”

For Example– 640 x 480, 1024 x 768 (Horizontal x Vertical)



Applications of Image Processing

Some application areas of Image Processing are as follow:

1.Computerized Photography

2.Space Image Processing(e.g., Hubble space telescope image, Interplanetary probe images)

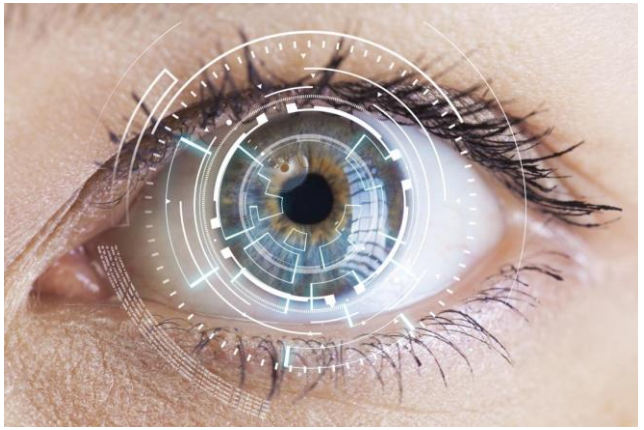
3.Medical/ Biological Image Processing

4.Automatic Character Recognition

5.Fingerprint/Face/Iris Recognition

6.Remote sensing

7.Industrial application



IMAGES AND AUDIO

AUDIO

Audio is sound within the acoustic range available to humans. An audio frequency (AF) is an electrical alternating.
In computers, audio is the sound system that comes with or can be added to a computer. ... When sound is played, the digital signals are sent to the speakers where they are converted back to analog signals that generate varied sound. Audio files are usually compressed for storage or faster transmission.

Audio is a term used to describe any sound or noise that is within a range the human ear is capable of hearing. Measured in hertz, the audio signal on a computer is generated using a sound card and is heard through speakers or headphones.

Any digital information with speech or music that can be stored on and played through a computer is known as an audio file or sound file. One of the most common types of audio file formats used today is the MP3. Clicking the triangular button on the following embedded player will play a short MP3 file in your browser.

AUDIO

To record a voice or music played outside of a computer, an audio file is created by using a microphone to record sound it detects. The sound is converted into a digital signal the computer uses to create the audio file. Audio files can also be created using software running on a computer. For example, a person could use an audio program like Audacity to record the sound played in a video file.

Types of Audio File Format

Each audio file type has unique benefits and drawbacks. Determine which one is best for specific tasks or situations to save time and reduce stressful errors. Here are seven popular audio file types and some unique differences between them.

1. M4A Audio File Type

The M4A is an mpeg-4 audio file. It is an audio-compressed file used in the modern setting due to increased quality demand as a result of cloud storage and bigger hard drive space in contemporary computers. Its high quality keeps it relevant, as users who need to hear distinct sounds on audio files will need this over more common file types. Music download software like Apple iTunes use M4A instead of MP3 because it's smaller in size and higher in quality. Its limitations come in the form of compatibility, as a lot of software are unable to recognize the M4A, making it ideal for only a select type of user.

2. FLAC

The FLAC audio file is Free Lossless Audio Codec. It is an audio file compressed into a smaller size of the original file. It's a sophisticated file type that is lesser-used among audio formats. This is because, even though it has its advantages, it often needs special downloads to function. When you consider that audio files are shared often, this can make for quite an inconvenience to each new user who receives one. What makes the FLAC so important is the lossless compression can save size and promote sharing of an audio file while being able to return to the original quality standard. The near-exact amount of storage space required of the original audio file is sixty percent – this saves a lot of hard drive space and time spent uploading or downloading.

Types of Audio File Format

3. MP3

The MP3 audio file is an MPEG audio layer 3 file format. The key feature of MP3 files is the compression that saves valuable space while maintaining near-flawless quality of the original source of sound. This compression makes the MP3 very popular for all mobile audio-playing devices, particularly the Apple iPod. MP3 continues to be relevant in today's digital landscape because it's compatible with nearly every device capable of reading audio files. The MP3 is probably best used for extensive audio file sharing due to its manageable size. It also works well for websites that host audio files. Finally, the MP3 remains popular because of its overall sound quality. Though not the highest quality, it has enough other benefits to compensate.

4. MP4

An MP4 audio file is often mistaken as an improved version of the MP3 file. However, this couldn't be further from the truth. The two are completely different and the similarities come from their namesake rather than their functionality. Also note that the MP4 is sometimes referred to as a video file instead of an audio file. This isn't an error, as in fact it's both an audio and video file. An MP4 audio file type is a comprehensive media extension, capable of holding audio, video and other media. The MP4 contains data in the file, rather than code. This is important to note as MP4 files require different codecs to implement the code artificially and allow it to be read.

5. WAV

A WAV audio file is a Waveform Audio File that stores waveform data. The waveform data stored presents an image that demonstrates strength of volume and sound in specific parts of the WAV file. It is entirely possible to transform a WAV file using compression, though it's not standard. Also, the WAV is typically used on Windows systems.

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6. WMA

The WMA (Windows Media Audio) is a Windows-based alternative to the more common and popular MP3 file type. What makes so beneficial is its lossless compression, retaining high audio quality throughout all types of restructuring processes. Even though it's such a quality audio format, it's not the most popular due to the fact it's inaccessible to many users, especially those who don't use the Windows operating system. If you're a Windows user, simply double-click any WMA file to open it. The file will open with Windows Media Player (unless you've changed the default program). If you're not using Windows, there are some alternatives to help you out. The first option is to download a third-party system that plays the WMA. If this isn't something you want to do, consider converting the WMA to a different audio format. There are plenty of conversion tools available.

Multiple Choice Question

MUTIPLE CHOICE QUESTIONS:

Sr no	Question	Option A	Option B	OptionC	OptionD
1	When both plates touch it creates voltage drop across the resistive plate that is converted into coordinate values of the selected position known as….	Optical methods	Electrical method	Acoustical method	All of these
2	In acoustical touch panel high frequency sound waves are generated in horizontal and vertical direction across a glass plates. Known as….	Electrical method	Optical methods	Acoustical method	none of these
3	Light pens are pencil-shaped device used to select positions by detecting light coming from points on the……. screen.	CRT	SRT	RAY TUBE	emerse
4	There are mainly …….. types of graphics software	3	2	4	none of these
5	General programming package uses for	common pupose	specific purpose	particular unique purpose	none of these

REFERENCES

- http://www.engppt.com/search/label/Computer%20Graphics