

Welcome students this is Bachelor of Science. Third year in the subject of Computer Science, Semester 6 for the course code CSD-106, which is Multimedia techniques.

I am Ms Shilpa Naik, Assistant professor from Dhemphe College of Arts and Science and will be covering the modules Raster graphics file formats and manipulation which are a part of Unit 3 Computer Graphics of the paper Multimedia techniques.

Here is the outline raster, graphics file formats and raster graphics manipulation.

Here are the learning outcomes. The students will be able to explain the various file formats that are used in raster graphics and explain the image manipulation in raster graphics.

Let us look at some of the commonly used raster graphics file formats. We have the graphics interchange format, the joint Photographic Experts Group that is JPEG, the portable network graphics that is PNG. The bitmap image given by BMP and the tagged image file format given by the TIFF.

Let us begin with the graphics interchange format. The gif was devised by Unisys Corporation, an CompuServe for transmitting graphical images over phone lines. The GIF standard is limited to an 8 bit or 256 color image. It can be animated and can save transparency. The GIFs use lossless compression and are typically smaller in size and very portable. They're well suited for similar images. An animated graphics like banner, ads, email images, and social media memes. However, the GIF images do not contain sound as they are a collection of images that are played very fast.

The next is a commonly used file format which is the JPEG file format. JPEG stands for joint Photographic Experts Group and was created by the same. It supports 8 bit grayscale images and 24 bit color images. However, the JPEG files do not support transparency. That is, each pixel must contain some color. Also it does not support animation. As you can see in the image. The image is having a very less quality and the quality increases as we move from the top left corner to the bottom right corner. JPEG uses a lossy raster format and the degrees of compression can be chosen while compressing an image, but this increases the pixelation. The more the image is compressed. The amount of compression can be chosen while saving an image in a JPEG format and editing it using programs like Adobe Photoshop and GIMP. JPEG is the most widely used formats online. It is used for photos, email, graphics, large web images and a popular format for digital cameras making it ideal for web use and non professional prints.

Next is the portable network graphics. As the name suggests, this type of files are portable and commonly used for sharing purpose. They are created as a free open source alternative to the gif. This support 8 bit paletted images with optional transparency and 24 bit true color images with 16 million colors or 48 bit true color. They have built-in transparency, but can also display higher color depth, which can translate up to 16 million colors. PNG uses a lossless format and has more advanced compression schemes than the gif. It works well in online viewing applications like web browsers and can be fully streamed with the progressive display option. It is a robust format providing full file integrity checking and simple detection of

common transmission errors. However, the PNG format does not support animation. The animated formats that are derived from PNG which is backward compatible with the PNG and are supported by most of the browsers.

The next commonly used format is the bitmap or the BMP format. This is developed by Microsoft. for Windows it is capable of storing 2 dimensional digital images that are both monochrome as well as color with various color depths, an optionally with the data compression, Alpha channels or color profiles. There is no much compression here, and thus there is no information loss. However, the file size is high due to no compression. The bitmap has a symbol structure and a wide acceptance. In Windows programs it is used best for high quality scans and archival copies.

The next in the list is the TIFF. format TIFF stands for Tagged image file format and was developed by the

Elders Corporation in the 1980s. Later on, supported by Microsoft. It's a flexible, adaptable file format to handle images and data within a single file. It includes header tags that mention the size, definition, image, data arrangement and applied image compression techniques that are defined along with the images geometry that if follows last, less or no compression, which results in very high quality images. They are used for scanning, faxing, word processing, high quality prints, professional publications, an archival copies. We next move on to the image manipulation. bitmap image is explicitly a collection of pixels. Thus, if we want to manipulate a bitmap image, we need to manipulate individual pixels. Editing individual pixels is time-consuming and also confusing. Thus for convenient image editing it is necessary to provide editing at a higher level than that of altering a single pixel.

There are two broad reasons for an image manipulation. The first one is to correct the deficiencies in an image that are caused by poor equipment or technique used in the creation or the digitization. For example, removal of red eye. The red glow that we sometimes see in the photographs in the eyes of the person whose portrait has been taken face on with the camera using a flash which is too close to the lens. This can be removed using the image manipulation software.

The second reason for image manipulation is to create images that are difficult or impossible to make naturally. That is, additional special effects such as a glow around an object. In order to manipulate an image, we need to select an area in an image and then apply the changes to that image. As we know, a bitmap image is an array of pixels. There is no identity of a shape here as everything is considered in terms of pixels. You're to select the parts of an image. You have to select an area within an image. The simplest selection tools use your are rectangular and elliptical marquee tools which let you to select an area by dragging a rectangle or an ellipse, just as you would draw these allows selection to be outlined with considerable precision and flexibility, and the Magic Wand tool that is used to select areas on the basis of the color.

The Magic Wand tool, once selected, causes all the pixels edges and to the cursor which are similar in color to the pixel under the cursor to be selected. A masked image manipulation is an area in the image that is not selected at all. Thus there are no changes applied to this area. Masked area itself can be

considered as an array of pixels, like being another image. We can have one or more masks in an image, and this can be remembered and used for more than one operation. In a photographic mask, the white parts of the image are considered to be transparent, while the black ones are considered to be opaque. Multiple bits can be used in a mask, thus making it a grayscale image with various degrees of transparency.

An Alpha channel is like a stencil made out of a material that allows varying amounts of paint or light to pass through it depending on the transparency value of each point. It is used to produce a soft edge around a cut-out shape. The edge of the selection can be feathered, which means that the hard transition from a black to white in an Alpha channel is replaced by a slow gradient passing through intermediate Gray values and corresponding to partial masking. Applying anti-aliasing to the edge of the mask reduces the jagged effect.

Here are the references used in this presentation.

Thank you.