Overview

- Creation of multimedia images.
- Creation of still images.
- Colors and palettes in multimedia.
- Image file types used in multimedia.

Creation of Multimedia Images

Before commencing the creation of images in Multimedia, one should:

- Plan their approach using flow charts and storyboards.
- Organize the available tools.
- Have multiple monitors, if possible, for lots of screen real estate.

Creation of Still Images

- Still images may be the most important element of a multimedia project.
- The type of still images created depends on the display resolution, and hardware and software capabilities.

Creation of Still Images

- Types of still images.
- 3-D drawing and rendering.

Types of Still Images

Still images are generated in two ways:

- Bitmaps.
- Vector-drawn graphics.

Bitmaps

- Bitmap is derived from the words ‘bit’, which means the simplest element in which only two digits are used, and ‘map’, which is a two-dimensional matrix of these bits.
- A bitmap is a data matrix describing the individual dots of an image.

Bitmaps

Bitmaps are an image format suited for creation of:

- Photo-realistic images.
- Complex drawings.
- Images that require fine detail.

Bitmaps

- Bitmapped images are known as paint graphics.
- A bitmap is made up of individual dots or picture elements known as pixels or pels.
- Bitmapped images can have varying bit and color depths.

Bitmaps

Bit Depth	Number of Colors Possible	Available Binary Combinations for Describing a Color
1-bit	2	0, 1
2-bit	4	00, 01, 10, 11
4-bit	16	0000, 0001, 0011, 0111, 1111, 0010, 0100, 1000, 0110, 1100, 1010, 0101, 1110, 1101, 1001, 1011

Available binary Combinations for Describing a Color

Bitmaps

Bitmaps can be inserted by:

- Using clip art galleries.
- Using bitmap software.
- Capturing and editing images.
- Scanning images.

Using Clip Art Galleries

- A clip art gallery is an assortment of graphics, photographs, sound, and video.
- Clip arts are a popular alternative for users who do not want to create their own images.
- Clip arts are available on CD-ROMs and on the Internet.

Using Bitmap Software

The industry standard for bitmap painting and editing programs are:

- Adobe's Photoshop and Illustrator.
- Macromedia's Fireworks.
- Corel's Painter.
- CorelDraw.
- Quark Express.

Capturing and Editing Images

- Capturing and storing images directly from the screen is another way to assemble images for multimedia.
- The PRINT SCREEN button in Windows and COMMAND-CONTROL-SHIFT-4 keystroke on the Macintosh copies the screen image to the clipboard.

Capturing and Editing Images

Image editing programs enable the user to:

- Enhance and make composite images.
- Alter and distort images.
- Add and delete elements.
- Morph (manipulate still images to create animated transformations).

Scanning Images

- Users can scan images from conventional sources and make necessary alterations and manipulations.

Vector-Drawn Graphics

- Applications of vector-drawn images.
- How vector-drawn images work?
- Vector-drawn images v/s bitmaps.

Applications of Vector-Drawn Images

Vector-drawn images are used in the following areas:

- Computer-aided design (CAD) programs.
- Graphic artists designing for the print media.
- 3-D animation programs.
- Applications requiring drawing of graphic shapes.

How Vector-Drawn Images Work

- A vector is a line that is described by the location of its two endpoints.
- Vector drawing makes use of Cartesian co-ordinates.
- Cartesian coordinates are numbers that describe a point in two or three-dimensional space as the intersection of X, Y, and Z axis.

Vector-Drawn Images v/s Bitmaps

- Vector images use less memory space and have a smaller file size as compared to bitmaps.
- For the Web, pages that use vector graphics in plug-ins download faster, and when used for animation, draw faster than bitmaps.

Vector-Drawn Images v/s Bitmaps

- Vector images cannot be used for photorealistic images.
- Vector images require a plug-in for Web-based display.
- Bitmaps are not easily scalable and resizable.
- Bitmaps can be converted to vector images using autotracing.

3-D Drawing and Rendering

- 3-D animation tools.
- Features of a 3-D application.
- Panoramas.

3-D Animation Tools

3-D animation, drawing, and rendering tools include:

- Ray Dream Designer.
- Caligari True Space 2.
- Specular Infini-D.
- Form*Z.
- NewTek's Lightwave.

Features of a 3-D Application

- Modeling - Placing all the elements into 3-D space.
- Extrusion - The shape of a plane surface extends some distance.
- Lathing - A profile of the shape is rotated around a defined axis.
- Rendering - Use of intricate algorithms to apply user-specified effects.

Panoramas

- Panoramic images are created by stitching together a sequence of photos around a circle and adjusting them into a single seamless bitmap.
- Software such as ULead Cool 360, and Panorama Factory are required in order to create panoramas.

Colors and Palettes in Multimedia

- Understanding natural light and color.
- Color palettes.

Understanding Natural Light and Color

- Light comes from an atom where an electron passes from a higher to a lower energy level.
- Each atom produces uniquely specific colors.
- Color is the frequency of a light wave within the narrow band of the electromagnetic spectrum, to which the human eye responds.

Understanding Natural Light and Color

- Additive color.
- Subtractive color.
- Monitor-specific color.
- Color models.

Additive Color

- In the additive color method, a color is created by combining colored light sources in three primary colors - red, green, and blue (RGB).
- TV and computer monitors use this method.

Subtractive Color

- In the subtractive color method, color is created by combining colored media such as paints or ink.
- The colored media absorb (or subtract) some parts of the color spectrum of light and reflect the others back to the eye.

Subtractive Color

- Subtractive color is the process used to create color in printing.
- The printed page consists of tiny halftone dots of three primary colors- cyan, magenta, and yellow (CMY).

Monitor-Specific Colors

- Colors should be used according to the target audience's monitor specifications.
- The preferred monitor resolution is 800x600 pixels.
- The preferred color depth is 32 bits.

Color Models

Models used to specify color in computer terms are:

- RGB model - A 24-bit methodology where color is specified in terms of red, green, and blue values ranging from 0 to 255.
- HSB and HSL models – Color is specified as an angle from 0 to 360 degrees on a color wheel.
- Other models include CMYK, CIE, YIQ, YUV, and YCC.

Color Palettes

- Palettes are mathematical tables that define the color of pixels displayed on the screen.
- Palettes are called 'color lookup tables' or CLUTs on Macintosh.
- The most common palettes are 1, 4, 8, 16, and 24-bit deep.

Color Palettes

Dithering:

- Dithering is a process whereby the color value of each pixel is changed to the closest matching color value in the target palette.
- This is done using a mathematical algorithm.

Image File Types used in Multimedia

- Macintosh formats.
- Windows formats.
- Cross-platform formats.

Macintosh Formats

- On the Macintosh, the most commonly used format is PICT.
- PICT is a complicated and versatile format developed by Apple.
- Almost every image application on the Macintosh can import or export PICT files.
- In a PICT file, both vector-drawn objects and bitmaps can reside side-by-side.

Windows Formats

- The most commonly used image file format on Windows is DIB.
- DIB stands for Device-independent bitmaps.
- The preferred file type for multimedia developers in Windows is Resource Interchange File Format (RIFF).

Windows Formats

Bitmap formats used most often by Windows developers are:

- BMP - A Windows bitmap file.
- TIFF - Extensively used in DTP packages.
- PCX - Used by MS-DOS paint software.

Cross-Platform Formats

The image file formats that are compatible across platforms are:

- DXF - Used by CAD applications.
- Initial Graphics Exchange Standard (IGS or IGES) - Standard for transferring CAD drawings.
- JPEG and GIF - Most commonly used formats on the Web.

Summary

- The computer generates still images as bitmaps and vector-drawn images.
- Images can be incorporated in multimedia using clip arts, bitmap software, or by capturing, editing, or scanning images.
- Creating 3-D images involves modeling, extruding, lathing, shading, and rendering.
- Color is one of the most vital components of multimedia.