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DEPARTMENT OF GRAPHICS AND CREATIVE DESIGN

COURSE NAME : VISUAL EFFECTS DESIGN

III YEAR /VI SEMESTER

Unit 1- DIGITAL FORMATS

DATA FORMATS

- In multimedia, data formats refer to the specific structures used to encode and store various types of multimedia content such as images, audio, video, and animations.

These formats determine how the data is organized, compressed, and presented in digital form, ensuring compatibility across different devices and applications.



Image Formats

JPEG (Joint Photographic Experts Group): Suitable for photographs with lossy compression.

PNG (Portable Network Graphics): Lossless compression, often used for images with transparency.

GIF (Graphics Interchange Format): Supports animations through multiple images.

Audio Formats

MP3 (MPEG Audio Layer III): Compressed audio format, commonly used for music.

WAV (Waveform Audio File Format): Uncompressed audio format, maintaining high quality.

FLAC (Free Lossless Audio Codec): Lossless compression while retaining high-quality audio.

Video Formats

MP4 (MPEG-4 Part 14): Commonly used for videos, supporting various codecs.

AVI (Audio Video Interleave): Older format supporting multiple streams of audio and video.

MKV (Matroska Multimedia Container): Versatile format supporting multiple tracks for video, audio, and subtitles.

Animation Formats

SWF (Small Web Format): Adobe Flash file format used for interactive multimedia content.

APNG (Animated Portable Network Graphics): An extension of PNG supporting animated images.

3D Model Formats

STL (Stereolithography): Common for 3D printing, representing surface geometry.

OBJ (Wavefront Object): Stores 3D model data including geometry and materials.

FBX (Filmbox): Enables interchange of 3D model data across different software.

Characteristics of Multimedia Formats

Compression: Many formats use compression to reduce file sizes without significant loss of quality.

Codecs: Encoders/decoders used to compress and decompress audio and video data within formats.

Compatibility: Ensuring that the format can be played or used across different devices and software.

Quality: Balancing between file size and maintaining high-quality multimedia content.

Metadata: Some formats allow embedding additional information like titles, descriptions, and copyright details.

Data Transfer

Data transfer refers to the movement or transmission of data from one location or device to another.

It involves the process of sending, receiving, or sharing digital information, which can include various types of content such as text, files, images, videos, or any other digital data.

File Formats: These determine how data is organized and stored in a file. Examples include DOCX for documents, MP3 for audio, and JPG for images.

Protocols: Define rules for data transmission between devices or systems. TCP/IP, FTP, HTTP, and SMTP are examples used for internet communication.

Color Depth

Color depth, also known as bit depth, refers to the number of bits used to represent the color of a single pixel in a digital image or display.

It quantifies the range of colors that can be displayed or stored in an image, determining the precision and richness of color rendition.

Bits per Pixel (bpp): Represents the number of bits used to represent the color of a single pixel in an image.

Common depths include:

8-bit: 256 colors

16-bit: 65,536 colors

24-bit: True Color (16.7 million colors)

32-bit: Adds an alpha channel for transparency

Color Spaces: Define the range and gamut of colors that can be displayed or reproduced. Examples include RGB, CMYK, and LAB.

Compression Formats

Compression formats are methods used to reduce the size of files or data for efficient storage, transmission, and processing while aiming to maintain acceptable quality.

Lossless Compression: Reduces file size without losing data quality. Formats like ZIP, PNG, and FLAC use this method.

Lossy Compression: Reduces file size by removing some data, which may result in a loss of quality. JPEG, MP3, and MPEG use this method.

Vector vs. Raster Compression:

Vector: Stores shapes and lines using mathematical equations, allowing scaling without loss of quality (e.g., SVG).

Raster: Stores images as a grid of pixels (e.g., JPEG, PNG) and can lose quality when scaled up.

THANK YOU