Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Technology, Pune-37
(An Autonomous Institute Affiliated to Savitribai Pune University)
Department of Electronics & Telecommunication Engineering

ET3221: Computer Vision

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Tutorial No.1

- Portable networks graphics (PNG) format allows for lossless compression, gamma and chromaticity correction, and two-dimensional interlacing, making retrieval faster along with gamma and chromaticity correction.
- Bit-mapped images (also known as raster images) make use of pixels, or picture elements, to define an image as a matrix made up of rows and columns of pixels. The advantage of using bit mapped images in digital teaching files is that they are specifically designed to handle computed tomographic, magnetic resonance, and photo graphic images. The disadvantage of using pixel based images is that they are resolution dependent, so that overall image quality is degraded if resolution is altered.
- Graphic Interchange Format/GIF was created in 1987 (4). As one of the first solutions to the problem of electronic image storage, it is the oldest and most widely supported and used Web-based graphic file format.The primary strength of GIF is its lossless compression algorithm (4–6), known as the Lempel Ziv-Welch (LZW) linear compression routine. Disadvantage is it is limited to 256 colors or shades of gray in an image.
- JPEG is not actually a file format, but the name of the compression algorithm developed by the Independent JPEG Group. The JPEG file format is referred to as the JPEG file interchange format (JIFF)
- With JPEG, the algorithm mathematically compares each pixel with adjacent pixels, allowing the user to adjust the compression level. Image compression to as little as 1/20 of the original file size can be achieved

- The primary weakness of JPEG is that it is a lossy compression technique that results in a loss of data with each compression, which may translate into image degradation.
- TIFF was created primarily by imaging developers of input and output devices such as printers, monitors, and scanners; as a result, it is specifically designed to be compatible with different image processing devices. Another strength is its use of different compression techniques. Lossless compression allows TIFF files to maintain image

Feature	JPEG	PNG	GIF	TIFF	WebP	BMP	SVG
Compression	Lossy	Lossless	Lossless	Lossless	Lossy	Lossless	N/A
File Size	Small	Variable, often large	Small	Very large	Smaller than JPEG	Very large	N/A
Image Quality	Good with minimal artifacts at moderate compression	Excellent, preserves all details	Limited to 256 colors, dithering can introduce artifacts	High, often used for archival purposes	Good, similar to JPEG but smaller	High, but can be pixelated at high zoom	Vector, perfect for sharp lines and text
Transparency	No	Yes	Yes (indexed)	Yes, with alpha channel	Yes	No	Yes
Color Depth	True color (16.7 million)	True color (16.7 million), also grayscale and indexed	Limited to 256 colors	True color (16.7 million), also grayscale	True color (16.7 million)	True color (16.7 million)	Unlimited (millions of colors)
Animation Support	No	No	Yes (limited frames and palette)	No	No	No	N/A
Application	Photographs, web graphics, general use	Logos, icons, screenshots, graphics with text	Web graphics with limited color, simple animations	Archiving, high-resolution images, professional photography	Web graphics with balance of quality and size	Screenshots, pixel art, basic graphics	Scalable graphics, illustrations, logos