# Formats for Digital images and movies

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## PPM Portable Pixmap

- Simple uncompressed family of formats
- Four basic types (I know, maybe more?):
- 1. P1: Ascii black and white
- 2. P3: Ascii color
- 3. P5: Binary BW
- 4. P6: Binary Color

# Image file formats

- There are many image formats
  - .ppm/pgm (generic unix)
  - .bmp, wmf (PC)
  - .pict (Mac)
  - .tiff (scanned)
  - .psd (Photoshop)
  - .gif, jpg, .png (Web)
- To deliver images over network, we need
  - cross-platform formats
  - compression

### PPM file layout

- 1. Magic number P1-P6
- 2. <width> <height> as ascii numbers
- 3. 255 (Max pixel value)
- 4. # <Comments>
- 5. <image data> ie lines of ascii numbers for P1-P3 or binary data for P5-P6

#### Matlab routine

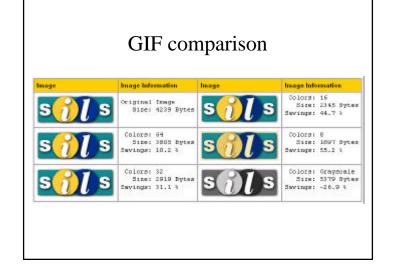
# Properties of GIF-encoded images

- Lossless compression scheme
- 8-bit, 256 colors maximum
- Compression sensitive to large blocks of the same color
- Reducing the number of colors is a major issue in reducing file size

#### **GIF**

#### **Graphics Interchange Format**

- Two versions: 87a and 89a
  - 87a interlacing, transparency
  - 89a interlacing, transparency, animation
- Uses indexed color
  - computer uses an index to map the colors
- Invented by CompuServe for BBS download
  - based on patented Lempel Zev Welch (LZW) compression



### JPEG (JPG)

Joint Photographic Experts Group

- "Lossy" compression
  - Some information is lost during compression
  - When saving, you can set the quality (ie. the amount of loss you are willing to accept)
  - Higher the quality, larger the file
  - jpg compression is best for images that are photorealistic
- True color (24-bit)
- Requires decompression to view
  - more CPU cycles to process than gif

#### JPG comparison Image Information Image Information Quality: 40 3 iginal Image Size: 4239 Bytes mile: 1681 Bytes avings; 36.7 4 mility: 70 % unliky: 30 % Bidel 3742 Bytes Size: 2097 Bytes winger 11.7 % umlity: 60 k 81se: 8276 Bytes avings: 22.7 % Side: 2100 Bytes wings: 50.5 % umlity: 50 % 81se: 2956 Bytes avings: 30.3 % Quality: 10 % 81ce: 1672 Bytes Bevings: 60.6 %

## GIF/JPEG Comparison

**GIF** 

- 256 colors
- · Lossless compression
- Better for images with few different colors (illustrations, text, sharp lines, buttons, logos, clip art, etc.)
- · Supports interlacing
- · Supports transparency
- · Supports animation

- JPEG

  Millions of colors
- Lossy compression
- Better for true color photographic images
- Compression/quality options available
- 24-bit support still an issue

#### **PNG**

Portable Network Graphics

- Compuserve /Unisyss, demanded royalties in 1995
- WC3 PNG Specification published
- Combines 24-bit encoding of JPG with the lossless compression, transparency and interlacing features of GIF
- Still not widely supported on development side, although latest version of some browsers do