

Module -V

Color Models and Color applications

$\Rightarrow \text{GIMP} = [\text{GNU Img manipula" prgm}]$

Image manipulation

- * It is a free & open source S/w.
- * It is cross-platform image editor available for GNU, windows & more es. You can change its source code & distribute yr changes.
- * High quality photo manipula". & provides the tools needed for high quality img manipula".
- * provides extensibility through integration with many prgming lang including python, perl & more.

Image manipula" using GIMP:

- * Has brushes, colors & painting tools.
- * Has 48 standard brushes, plus facilities to create new ones.
- * Brushes can be used in hard-edged, soft-edged, be applied at different opacities.

- * palette with RGB, HSV, color wheel, CMYK, plus tools to pick colors from the image with various picking options.
- * sprt (for hexadecimal color codes (used in HTML))

* Selection tool:

Allows part of our image to be selected in the shape of a or .

- * Layers: are very helpful for organizing yr file, & can edit (adding you make).
- * Saving: default file format for GIMP file is an .xcf file

II Components of GIMP:

1) Title bar:

- * Located at the top, showing the name of the file, color mode or an opened image.
- * Also displays the menu bar when you take yr mouse pointer on it & window controller buttons on the left.

2) menu bar:

- * Displays menus that contain most of GIMP Cmds. & C's. It will appear only when you take yr mouse pointer on the title bar.

3) Tool bars:

- * Displays a variety of icons, each representing an image-editing tool.
- * Also displays the current foreground & background colors.

4) Tool options:

Displays the options relevant to the selected tool.

5) Image window:

You can open an image in the image window in GIMP. All the image editing is done in here.

6) Panel:

Has small windows that give you access to common commands & files.

III Applications of GIMP:

- 1) Photo Retouching: Allow users to enhance & manipulate photo graphs by adjusting colors & retouching details.

2) Graphic design:

Serve as a complete g. design tool.

3) Digital art

- 4) Web graphics: designs we can use to create web graphics including sites, e-books, etc.

Pluses & cons:

Pros:

- Free
- Open source
- Lots of features

Cons:

- Not as user friendly as Photoshop

5) Animation

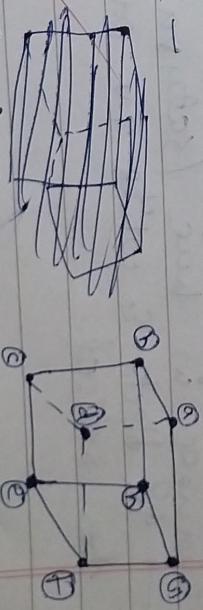
- ⇒ Batch processing : Allow user to automate repetitive tasks through scripting & processing.
- ⇒ Scientific imaging : GRIMP utilized for processing image.
- ⇒ Platform independence : GRIMP is available on multiple platforms like windows, macos & linux.

File format supported in GRIMP:

- 1) JPEG - suitable for web img & photography & most widely used c-space.
- 2) PNG - lossless compression, preserving img quality.
- 3) GIF - Sport animation
- 4) TIFF - commonly used for publishing & photography.
- 5) BMP - used in windows environments
- 6) XCF - ideal for saving projects with the intention to continue editing later. (GIMP)
- 7) PSD - Native file format for Adobe Photoshop.

1 RGB:

- * c-spaces are the mathematical representation of a set of colors.
 - * These color spaces are directly related to "saturat" & brightness. All of these colors are derived from RGB info using devices such as cameras & scanners.
 - * There are many c-models -
- ⇒ Color Models = / color spaces :
- * c-spaces



- * It's also stated that each color img is actually formed of 3 different imgs. R, G & B
- * A normal grayscale img can be defined by only 1 matrix, but a color img is actually composed of 3 different matrices.
- * 1 coloring matrix = red matrix + blue matrix + green matrix

- * RGB color -
- a → Blue = $(0, 0, 1)$
- b → Magenta $(0, 1, 0)$
- c → Green $(1, 0, 0)$
- d → Black $(0, 0, 0)$
- e → Yellow $(1, 1, 0)$
- f → Cyan $(0, 1, 1)$
- g → Cyan $(0, 1, 1)$
- h → White $(1, 1, 1)$

* App ~ CRT

→ liquid crystal display (LCD)
→ LED display
→ comp monitor

~~1. RGB~~
~~2. CMYK~~
~~3. YIQ~~

CMY : (Cyan, Magenta, Yellow)

* It is a Subtractive color model used in printing.

- * This primary colors are combined to produce a wide range of colors by subtracting varying amounts of light.
- * used alongside the key color in CMYK printing to enhance color accuracy & depth.
- * used in light absorbing devices.

- Y IQ :
- * used for TV broadcast.
 - * This model was designed to separate chrominance (I & Q) from luminance (Y).
 - * The Y-channel contains luminance info while the I & Q channels carried the color info.
 - * The adv of this model is that more bandwidth can be assigned to Y-component bcz the human visual system is more sensitive to changes in luminance than to changes in hue / saturation.
 - * \rightarrow In black & white TVs only Y can be noticed.