## Photoshop 01

Introduction to Computer Graphics UIC / AA/ AD / AD 205 / F05/ Sauter .../documents/photoshop\_01.pdf

## Topics

Raster Graphics Document Setup Image Size & Resolution Tools Selecting and Transforming Objects & Areas Masks Clipping Paths Layers, Blending Modes Image Adjustments Color Modes File formats: PSD, TIFF, JPG, GIF, EPS Scanning images

## Raster Graphics Image

A raster graphic image is a data structure representing a grid of pixels/color points, displayed on a computer screen, data projector, etc.

Images in the RGB color space predominantly consist of colored pixels defined in three bytes, one for red, one for green, and one for blue (an eight-bit byte can hold 256 possible values ( $2^8 = 256$ ) ranging from 0 to 255)

A black and white image requires only one bit  $(2^1 = 2 \text{ colors}, \text{ values } 0 \text{ and } 1, \text{ black}$ and white) for each pixel

Raster graphics distinguish themselves from vector graphics in that vector graphics use geometric objects (such as curves, lines, polygons) to represent an image

## Image Quality

The quality of a raster image is determined by the total number of pixels, (often called image resolution), and the amount of color information in each pixel (often called color depth).

For example, an image that stores 24 bits (8 bits for red, 8 bits for green, 8 bits for blue) of color information per pixel (the standard for all displays since around 1995) can represent smoother degrees of shading than one that only stores 16 bits per pixel, but not as smooth as one that stores 48 bits. Likewise, an image sampled at 640 x 480 pixels (therefore containing 307,200 pixels) will look rough and blocky compared to one sampled at 1280 x 1024 (1,310,720 pixels).

Width, Height: Absolute image width and and image height (available units: inches, pixels, cm)

Resolution: Number of pixels per inch (standard unit), or pixels per cm (optional). The equivalent in print is dpi, dots per inch

Color Mode and Color Depth: Bitmap (1 Bit), Grayscale, RGB, CMYK, Lab (8 Bit or 16 Bit for each channel)

Background Color: White, Background Color or Transparent





- A. Menu bar
- B. Options bar
- C. Toolbox
- D. Active image area
- E. Palette well
- F. Palettes



#### Tools

Most tools in the toolbox (left) have options that appear in the context-sensitive tool options bar (top).

Other tools in the toolbox allow you to change foreground/background colors, or jump between Photoshop and ImageReady applications.

Clicking on the small triangles opens a pop-up-window with related hidden tools



The marguee tools make rectangular, elliptical, single row, selections, layers, and and single column selections.



The Crop tool trims images.



The Patch tool\* repairs imperfections in a selected area of an image using a sample or pattern.



The Clone Stamp tool paints with The Pattern Stamp tool\* a sample of an image.



The Move tool moves guides.



slices.



The Color Replacement tool\* replaces a selected color with a new color.



paints with part of an image as a pattern.



The lasso tools make freehand, polygonal (straight-edged), and magnetic\* (snap-to) selections.



The Slice Select tool selects slices.



The Brush tool paints brush strokes.



The History Brush tool\* paints a copy of the selected state or snapshot into the current image



The Magic Wand tool selects similarly colored areas.



The Healing Brush tool\* paints with a sample or pattern to repair imperfections in a image.





The Art History brush tool\* paints with stylized strokes that simulate the look of different paint styles, using a selected state or snapshot.









The Pencil tool paints hard-edged strokes.



The Eraser tool erases pixels and restores parts of an image to a previously saved state.



The Background Eraser tool\* erases areas to transparency by dragging.



The Magic Eraser tool erases solid-colored areas to transparency with a single click. colors.



The gradient tools\* create straight-line, radial, angle, reflected, and diamond blends between





The Paint Bucket tool fills similarly The Blur tool\* blurs hard colored areas with the foreground edges in an image. color.



The Sharpen tool\* sharpens soft edges in an image.



The Smudge tool\* smudges data in an image.



The Dodge tool\* lightens areas in The Burn tool\* darkens an image.



areas in an image.



The Sponge tool\* changes the color saturation of an area.



The path selection tools\* make shape or segment selections showing anchor points, direction lines, and direction points.



The Custom Shape tool\* makes customized shapes selected from a custom shape list.



The type tools create type on an image.



The type mask tools\* create a selection in the shape of type.



The pen tools\* let you draw smooth-edged paths.





notes and audio annotations that samples colors in an can be attached to an image. image.



The Measure tool\* measures distances, locations, and angles.



The Hand tool moves an image within its window.



The Zoom tool magnifies and reduces the view of an image.



The image map tools<sup>§</sup> define image map areas in tool<sup>§</sup> selects image maps. an image.



The Image Map Select



<u>The Toggle Image Map Visibility tool<sup>§</sup> toggles</u> between showing and hiding image maps.



The Toggle Slices Visibility tool<sup>§</sup> toggles between showing and hiding slices in an image.



previews rollover effects directly in ImageReady.



The Preview Document tool<sup>§</sup> The Preview in Default Browser tool<sup>§</sup> previews animations in a Web browser.



The Tab Rectangle tool<sup>§</sup> draws a long rectangles with the top corners rounded. The Pill Rectangle tool<sup>§</sup> draws a rectangle with rounded corners.

# Selecting and Transforming Objects

- You can use the Lasso tool, the Polygonal Lasso and the Magnetic Lasso to draw freehand and straight-edged segments of a selection.
- The Magic Wand Tool lets you select a consistently colored area in a specific color range. In the options bar, you can specify whether to add a new selection , add to an existing selection, subtract from a selection, or select an area intersected by other selections.

Note: After creating a selection, menu bar item 'Select' offers the option to

- select similar color areas
- grow a selection by a specific number of pixels
- choose 'Feather' to create smooth/blurred outlines
- inverse the selection
- 'Transform...' a selection (scale, rotate, stretch) [Shortcut: CTRL-T]



## The Pen-Tool

The Pen tool lets you create straight lines and smooth flowing curves with great precision. For most users, the Pen tool provides the best control and greatest accuracy for drawing.

clicking on the small triangle at the pen tool shows other option the tool can offer, such as

- adding anchor points
- deleting anchor points
- freehand pen
- convert to point

Those options can also be accessed by holding down the ALT and CTRL/Apple.

The Pen tool creates a layer with a fill color and attached vector mask (next slide)





Layer Masks control how different areas within a layer are hidden and revealed.

You can also edit a layer mask to add or subtract from the masked region. A layer mask is a grayscale image, so what you paint in black will be hidden, what you paint in white will show, and what you paint in gray shades will show in various levels of transparency.

You can apply a variety of special effects to the layer without actually affecting the pixels on that layer



# Layering and Blending modes

Layers allow to work on one element of an image without disturbing the others.

One can think of layers as sheets stacked one on top of the other. If there are areas without image information on a layer, you can see through to the layers below.

A layer's blending mode determines how its pixels blend with underlying pixels in the image.

It is helpful to think in terms of the following colors when visualizing a blending mode's effect:

- The base color is the original color in the image.
- The blend color is the color being applied with the painting or editing tool.
- The result color is the color resulting from the blend.

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## Image Adjustments

Levels

Brightness/Contrast

Color Balance

Desaturate

Replace color

Invert

Threshold

Posterize

Variations

## Color Modes

Bitmap: uses two color values (black or white) to represent the pixels in an image

Grayscale: uses up to 256 shades of gray. Every pixel of a grayscale image has a brightness value ranging from 0 (black) to 255 (white).

RGB: RGB images use three colors/channels (red, green, blue), to reproduce colors on-screen. The three channels translate to 24 (8 bits x 3 channels) bits of color information per pixel.

CMYK: each pixel is assigned a percentage value for each of the process inks. The lightest (highlight) colors are assigned small percentages of process ink colors, the darker (shadow) colors higher percentages. For example, a bright red might contain 2% cyan, 93% magenta, 90% yellow, and 0% black. In CMYK images, pure white is generated when all four components have values of 0%. Use the CMYK mode when preparing an image to be printed using process colors.

Duotone: Duotone mode creates monotone, duotone (two-color), tritone (threecolor), and quadtone (four-color) grayscale images using two to four custom inks. Only 8-bit grayscale images can be converted to duotones.

Indexed Color: 8-bit color limited color palette image (can reduce file size while maintaining enough visual quality for certain applications like a multimedia presentation or a Web page)

## File Formats

PSD: Photoshop format is the default file format and the only format that supports most Photoshop features, such as preserving layers, effects, paths etc., therefore it is the best way to archive complex compositions. Because of this fact, the file size can be rather high. Adobe applications like Adobe Illustrator, Adobe InDesign, Adobe Premiere, Adobe After Effects, and Adobe GoLive can directly import PSD files.

TIFF: Tagged-Image File Format is used to exchange files between applications and computer platforms. TIFF is a flexible bitmap image format supported by virtually all paint, image-editing, and page-layout applications. Also, virtually all desktop scanners can produce TIFF images.

EPS: Encapsulated PostScript language file format can contain both vector and bitmap graphics and is supported by virtually all graphic, illustration, and pagelayout programs. EPS format is used to transfer PostScript-language artwork between applications. When you open an EPS file containing vector graphics, Photoshop rasterizes the image, converting the vector graphics to pixels.

JPEG: (Joint Photographic Experts Group) format is commonly used to display photographs and other continuous-tone images on the Web and other online services. JPEG format supports CMYK, RGB, and Grayscale color modes, and does not support alpha channels. Unlike GIF format, JPEG retains all color information in an RGB image but compresses file size by selectively discarding data. A JPEG image is automatically decompressed when opened. A higher level of compression results in lower image quality, and a lower level of compression results in better image quality.

GIF: (Graphics Interchange Format) is the file format commonly used to display indexed-color graphics on the Web. GIF is an compressed format designed to minimize file size and electronic transfer time by limiting color depth and compressing repetitive patterns within the image

# Scanning images

If the scanner device has been installed properly, Photoshop offers the option to scan/digitize images and manipulate them after they have been imported.

Choose File/Import to start an external scanner plugin/driver application (e.g. TWAIN import...).

Those scanner software allows to determine the:

- area to scan
- source material (film positive, negative, print)
- resolution
- color depth

## Credits

This tutorial is based on:

Adobe Photoshop CS Help

Wikipedia, the free encyclopedia

- http://en.wikipedia.org/wiki/Raster\_graphics