PHOTO 11: INTRODUCTION TO DIGITAL IMAGING

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EXAM REVIEW

Computer Components:
Hardware - the term used to describe computer equipment -- hard drives, printers, scanners.

Software - the term used to describe computer programs --such as Photoshop, InDesign, Pagemaker, Illustrator.

Memory
ROM -- read only memory, which is permanent.

RAM -- random access memory which is temporary.

1. The more the better for photographers.
2. Contents are lost when computer is shut down.

Information about a computer's memory can be found under the apple menu in "About this computer".

File storage devices include:
Hard drives, Jump Drives, Zip disks, CD's, DVD's.
The larger the number designation of the storage device the more information the drive can hold. For example, a 2-gigabyte hard drive can hold more software or images than a 1-gigabyte drive.

Scratch space/disk-- Generally the hard drive on a computer. When the RAM on the computer has been fully utilized, Photoshop resorts to its own version of Virtual Memory -- a method of using empty space on the hard drive (the scratch disk). Three to five times a file's size of empty space on the hard drive is required for Photoshop to operate.

Speed -- the faster the processor the more quickly an image can be redrawn after changes are made. Higher numbers mean faster computers i.e. a 500 megahertz processor is faster than a 300 megahertz processor.

CPU/ Central Processing Unit - A large chip, which holds the "brains" of the computer.

File size is determined by these five factors:

1. Mode (grayscale or color) A color photograph, all other factors being equal, requires a larger file than a black & white photograph. RGB files are smaller than CMYK files.

2. Resolution (the quality of clarity and definition of an image) expressed as:

ppi -- pixels per inch, reference to a digital image.

dpi -- dots per inch, related to output (printing)

lpi -- lines per inch, output (printing) reference to a halftone image.

The higher the resolution the larger the file size, all other factors being equal.

3. Image size - the actual size the photograph will print -i.e. an 8x10 print will be a larger file than a 5x7 print.

4. Bit Depth - the greater the bit depth the finer distinctions in color possible. This is dictated at scanning or shooting (in higher end digital camera's) stage. 24 bit is most common = 8 bits per channel R+G+B, produce over 16.7 million colors. also available (We only used 8 bit images in this class as many Photoshop commands can only be completed in 8-bit color.)

5. Things we do within Photoshop increase file size including Channels (saved selections) and Layers.

TERMS

Adjustment layer - Color and tonal changes reside on a separate layer through which underlying image layers appear. Adjustment layers, by default, affect all the layers below them. (Adjustment layers can be "clipped" or "linked" to affect just one layer below them. Adjustment layers cannot affect layers above them.

Anti-alias - A technique used to reduce the effect of the jagged edges in a bitmap program such as Photoshop -- used for type as well as photographs. This should always be checked in the Options bar.

Clipboard - Temporary storage (in RAM) of items copied or cut from an image. Cutting (command X) or copying (command C), both delete the last item from the clipboard, replacing it with the new item. Because it is stored in RAM, information stored on the clipboard is lost when the computer is shut down. A more efficient way than copying and pasting is to use the shortcut Command J which will copy then paste a selection to a new layer. This command does not use the clipboard therefore using less memory so Photoshop works more efficiently.

Channels - Grayscale images that store information such as: color, masks and selections. All Photoshop images contain at least 1 channel. RGB images contain a minimum of 3 channels, grayscale images contain a minimum of 1 channel.

Clone Stamp tool - makes a duplicate of digital image data (pixels). It is possible to copy part of an image onto another image or other areas of the same image. To use this tool Option click in one area, let up on the mouse then click and drag to another area.

Curves dialog box - adjusts tonal range and color balance of an image, by plotting points on a curve (up to 256 densities). This is where you can check and/or use one of the auto functions - auto color, auto contrast and auto levels as they are all located together under Options in this dialogue box.

Levels dialog box allows you the possibility of increasing the tonal range, or dynamic range, of an image. and color balance of an image, by plotting points on a curve (up to 256 densities). This is where you can also check and/or use one of the auto functions - auto color, auto contrast and auto levels as they are all located together under Options in this dialogue box.

Feathering – A Photoshop method of softening the edges of a selection. Do not ever check this in the Options bar – it is better to feather after making a selection.

File Compression – a method of economizing storage space by eliminating information in a file that a compression program considers redundant. Some methods of compression lose more information than others. JPEG's (Joint Photographic Experts Group) is a "lossy" compression. TIFF (Tagged Image File Format) is a loss-less compression. Saving your file as a .psd document is loss-less and does not compress the file.

Histogram – a map or graph of all the pixels in your images, showing the brightness level from the darkest to the lightest tone. Histograms can be seen in both the levels dialogue box and in the histograms dialogue box. Histograms can be adjusted in levels.

History palette - Records each image alteration step as Photoshop user works. Permits multiple "undos". Also permits temporary saves in the form of Snapshots (saved versions of photographs that last as long as the image file is open). After saving and closing your image snapshots are **not** saved and will not be available.

Resample (Interpolation) - adding or subtracting pixels in a photograph. Photoshop estimates then adds new pixels or eliminates redundant pixels. Occurs when image is enlarged, reduced, rotated, transformed or compressed. Bicubic (either sharper or smoother) is the most precise, but slowest, method of interpolation in Adobe Photoshop and is the best method for resampling photographs. Nearest neighbor and bilinear are other options for resampling but neither is a good choice when resampling photographs.

Layer mask - A grayscale image on a layer you can use to hide or show layers below. Painting on a layer mask with black hides information on the layer the mask is on and shows information on the layer below. Painting with white reveals information on the layer the mask is on and hides information on the layer below. (Think of black as a "hole" poking through the layer you're on and showing what's below.)

Levels - Adjusts tonal range & color balance by adjusting shadows, midtones, & highlights. A histogram provides visual reference.

Mega pixel - Measurement equaling one million pixels. A higher pixel count equals a higher image resolution and larger file.

Pixel - Picture element. A single dot (square) of light on the monitor, which contributes to the formation of an image.

Pixilation - Impairment of the image in which pixels are large enough to become individually visible.

Selection - A selected portion of an image (group of pixels), made with a tool such as rectangular marquee, magic wand, or lasso. Selections can be copied to the clipboard and/or saved to use later. Selections are saved as channels and, unlike snapshots, will be available even after closing an image if they are saved with the image.

Tolerance - The Photoshop term used to specify the range of pixels selected, according to their color, with tools such as the magic wand and magic eraser. The higher the number the greater the number of pixels to be affected/selected. Higer tolerance will choose more shades of a color.

Unsharp mask - An adjustable Photoshop filter which increases pixel contrast to reduce blurring in images. Based on traditional darkroom technique. This is the best method in Photoshop for sharpening an image, although it cannot correct an out of focus image. This should be done last before printing and after any tonal changes.

U.S. Copyright Law: A photographer owns a photograph and sells only the right to use that image for a stated purpose, for a particular time period. Copyright lasts for life plus 70 years. Copyright on work for hire (work owned by an entity rather than an individual) lasts either 95 years from first publication or 120 years from creation, whichever is shorter.

Violation of copyright is the duplication of the whole or a substantial part of a photograph exactly or by simulation or imitation and is illegal and unethical.

Copyright Exceptions:
1. Work for hire - the photographer is an employee of the publication, with all usual rights of a regular employee

2. Fair use (educational use, scholarly research or a book review). Or when the photograph itself becomes newsworthy.

Digital Cameras:

ISo is the sensitivity or speed and can be adjusted -Individual images can be exposed at a different IS0's. The lower the ISO, the more light that is needed and the less sensitive. ISO 400, for example, requires less light to make a photograph than ISO 100. Noise, (digital grain), and pixilation are problems when making photographs at higher ISO's

Lenses for Digital Cameras have a narrower angle of view and larger image size than the same lens on a 35mm camera. For example, a 50mm lens on a digital body has the same properties (angle of view) as an 80mm lens on a standard film body. What this means is you need wider lenses on digital cameras to get as much of the scene in your image as you do with a film cameras.

Digital Zoom – The lens crops from the middle of a digital image. Uses resampling. This is not a good thing and can never equal the quality of optical zoom lens. Comparable to magnifying not actually zooming.

Optical Zoom- Increased angle of view & image size produced by lens optics. Superior to digital zoom. This is what you want.

Image Storage - In place of film, images are stored in digital cameras on flash cards, memory sticks or similar devices.

Other things you should know:
All tools & filters we talked about including:
Blur, Unsharp mask, Liquify, Transform, and free transform.
Know the difference between transform and transforming selections.
Selecting
Quick Mask Mode.
Shortcuts used often
Resampling and everything in the Image size dialog box
What to check when in Image size dialog box
How to Flatten
Layer sets
Effects (layer styles)
Like drop shadow, inner glow etc.
Options Bar changes for different tools
Opacity
Know the differences between background, regular and adjustment layers,
Bridge (slide shows, contact sheets, rotating),
Using gradients on masks,
Know the difference between gradients with transparency and regular gradients.
Blend modes
Clipping masks and linking layers

In addition to this information study class notes and all handouts. (Handouts are available at: http://www.csus.edu/indiv/l/leiths/class_sched_2007.html