

Today: Photoshop/Gimp intro  
Spatial and temporal resolution

Minute paper:

- 1) What was the most important thing you learned about lenses and exposure?
- 2) What questions do you still have about lenses and exposure?

Get Wet: Post in Dropbox AND as a discussion topic

Buy Photoshop bundled with other Adobe apps

**Adobe Creative Cloud subscription: \$240-\$360 annually**

<http://www.colorado.edu/oit/creative-cloud-faq>

Other options: previous versions of PS on eBay etc., but can't open new camera RAW files.

Photoshop Elements: < \$100, probably adequate for this class.

Adobe Lightroom: not as powerful as PS, is designed for professional photography workflow, making same changes to many images at once.

Gimp: Online, open source image processing software.

Most image processing software will be adequate for this course: crop, brightness, intensity, spotting

## Other Resources

Rent macro lenses and other equipment: Pro Photo Rental on Arapaho

<http://prophotorental.com/>

Canon, Nikon, Olympus bodies and lenses. Also used equipment for sale

New firmware for your Canon; allows much more control

<http://chdk.wikia.com/wiki/CHDK> open source

Canon Hack Development Kit

Mostly non-DSLRs

<http://www.magiclantern.fm/about.html> also open source

"Magic Lantern is a software enhancement that offers increased functionality to the excellent Canon DSLR cameras. We have created an open framework, licensed under GPL, for developing extensions to the official firmware."

Topics in PS/gimp that we'll cover today:

1. Desktop nav
2. Contrast
3. Color channels
4. Crop tool
5. Clone stamp
6. Filters
7. Layers; advanced topic, won't really get to.

1. Desktop nav: menus, tools, toolbar info, history,

2. Contrast

Increase contrast in PS:

Use Image>Adjustments>Curves or hotkey ctrl-m

Gimp: Colors menu > Curves

It's all you need. Avoid automatic adjustments; they will rob you of skill.

Look at info, shows RGB values. Also shows equivalent CMYK, used in hardcopy industry.

Curve = 'transfer function'; maps starting pixel values to final.

Increased contrast has 'S' shape.

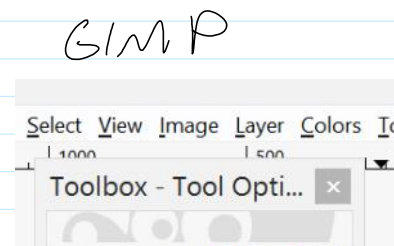
Avoid saturating highlights and shadows; try to retain information there by having a non-zero slope at bottom and top.

4. Crop tool:

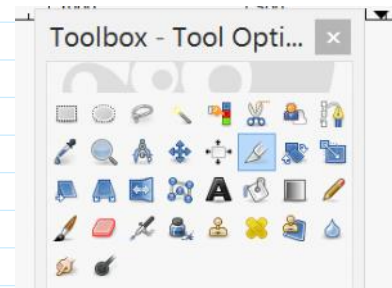
Make sure specs in toolbar are clear.

Can rotate crop using cursor outside of crop area

Choose 'Perspective' in toolbar to change a non-rectangular



Can rotate crop using cursor outside of crop area  
Choose 'Perspective' in toolbar to change a non-rectangular area into a rectangular one. Caution! Stretching part of an image can destroy geometry information.



## 5. Clone stamp

Better than 'healing brush' for corrections, but healing brush really is good for fixing face blemishes.

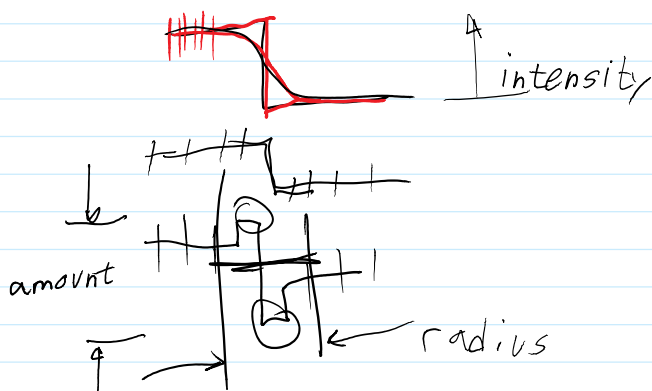
PS: select source with Alt click

Gimp: select source with Ctrl click

## 1. Filters

Can do wild stuff, but algorithms are unknown. When making images for both scientific and artistic purposes, avoid destroying information whenever possible. Try to get desired effects with known transformations instead of mysterious ones.

Sharpen: amplifies difference between adjacent pixels. Old painting technique; edges outlined by black on one side, white on the other. Use Unsharp Mask.



Good tutorial: <http://psd.fanextra.com/tutorials/photoshop-sharpen/>

## File Formats

PS: Save As

Gimp: Export

OK to send final images in these formats

Native PS format: psd

Native Gimp : xcf

Do NOT send FINAL images as JPG!

Information is **lost** when saving in jpeg

[http://cscie12.dce.harvard.edu/lecture\\_notes/2011/20110309/slide42.html](http://cscie12.dce.harvard.edu/lecture_notes/2011/20110309/slide42.html)

Non-Lossy image file formats. These are acceptable for edited images submitted in class.

TIF, PNG, PSD, xcf

Most PHD cameras store images as jpg. Open in PS, then edit and store as PSD, Photoshop's native format.

DON'T use *Photoshop* RAW. Metadata is lost; images can't be opened.

*Camera* raw formats, like NEF, CR2 etc, are OK.

