Image Handling Notes
Figure Making Workshop
Jan/Feb 2018

Quick Guide to Using Images (TIFF, JPEG, PNG, BMP) in/as figures

1) Open the image in Photoshop or GIMP.
2) Adjust 'Levels' and 'Crop' as needed*
3) Set Resolution to 220 ppi (no change in pixel number) *
4) Insert/drag the new image into Powerpoint.
5) In Powerpoint:
    a. If the image is larger than needed: Drag to shrink (optional: 'Format Picture' > 'Compress' if it was much too big).
    b. If the image is smaller than needed: Re-open in PS/GIMP: Resize* by adding pixels without interpolation. Repeat step 4.

* see detailed instructions below for instructions on how to do this.

I. File Format Tips: For image (raster) files you make (microscope images, scans, photos, screen captures, *etc*).

- Keep your original image ('master copy') as a TIFF if possible (*e.g.*: File.tiff)

- Edit copies of your image, so that the master file is untouched (save each edit as a PNG, *e.g.*: File_mod1.png)

    - Note: Ultimately, when you save your PPT Figure or Word document as a PDF, your embedded images will be converted to high quality JPEGs (this will reduce the file size). *Repeatedly editing and re-saving a JPEG will cause image compression artifacts; therefore, avoid saving your images as JPEGs before inserting them into Word (use PNG instead).*

II. How to Crop an Image: remove excess area/space/details.

Tip: Think about the shape of the image you want for your figure before you crop (*i.e.*, square, wide rectangle, *etc*).

- In Photoshop (licensed software)
    - Open an image.
    - Select the crop tool in the toolbar or press 'c'
    - Draw a box around the part of the image you want to keep
    - Double click inside the box

- In GIMP † (freeware for PC or Mac)
  - Open an image.
  - Select the crop under the *'Tools'* menu > *'Transform Tools'* or press shift-C
  - Draw a box around the part of the image you want to keep.
  - Double click inside the box.

† In GIMP, to save as 'Tiff', 'PNG', use 'File' > 'Export' instead of 'Save' or 'Save As'.

III. How to Adjust the Pixel Intensities of an Image (brightness, contrast, gamma)

Tip 1: Try to set just ~1 % of pixels to the brightest level; Avoid 'saturating' pixels, which is caused by setting too many pixels to the brightest level

Tip 2: You can also adjust the brightness of your images crudely after you insert them in Powerpoint by clicking on the image and selecting 'Format Picture' > 'Corrections'.

- In Photoshop (licensed software)
  - Open an image.
  - Select *'Image'* menu > *'Adjustments'* > *'Levels'*
  - For color images, select the *'Channel'* color you want to adjust (or do them all at once using *'RGB'*).
  - Decrease the top slider triangle under the histogram until the triangle is under the brightest pixel value present in your image *(i.e.,* until the brightest part of the image appears maximally bright)
  - Increase the bottom slider triangle under the histogram until the background is dim (don't make the background black, just dim).
  - Decrease the middle slider triangle under the histogram until the mid-tones are suitably bright.
  - Click *OK*.

- In GIMP (freeware for PC or Mac)
  - Open an image
  - Select *'Colors'* menu > *'Levels'*
  - For color images, select the *'Channel'* color you want to adjust (or do them all at once using *'RGB'*)
  - Decrease the top slider triangle under the histogram until the triangle is under the brightest pixel value present in your image (*i.e.,* until the brightest part of the image appears maximally bright).
  - Decrease the bottom slider triangle under the histogram until the background is dim (don't make the background black, just dim).
  - Increase the middle slider triangle under the histogram until the mid-tones are suitably bright.
  - Click *OK.*

† In GIMP, to save as 'Tiff', 'PNG', use 'File' > 'Export' instead of 'Save' or 'Save As'.

IV. How to Set the Proper Image Resolution & Dimensions *(easy as 1-2-3)*

Following these simple steps will ensure you get professional quality printed images. However, if you are uncomfortable editing images, just insert your images directly into Powerpoint and resize them there: your pictures will not be 'perfect', but they will be acceptable for this level of publication.

STEP 1: Set image resolution to 220 ppi (pixels per inch).

- In Photoshop (licensed software):
  - Open an image.
  - Select *'Image'* menu > *'Image Size'*.
  - ***IMPORTANT*:** ***Uncheck 'Resample Image'.***
  - Change 'Resolution' to 220 pixels/inch.
  - Note the size of your image in inches at 220 ppi.
  - Click *OK*.

- In GIMP (freeware for PC or Mac):
  - Open an image.
  - Select *'Image'* menu > *'Scale Image'*
  - ***IMPORTANT*: Set Quality: Interpolation to 'None'.**
  - Change *'X Resolution'* and *'Y Resolution'* to 220 pixels/inch.
  - Note the size of your Image Size in inches at 220 ppi.
  - Click 'Scale'.

† **In GIMP, to save as 'Tiff', 'PNG', use 'File' > 'Export' instead of 'Save' or 'Save As'.**

STEP 2: Insert your final picture (adjusted, cropped, at the right image dimensions/resolution, PNG format) into Powerpoint. At this point, you can resize your image by dragging the corner in Powerpoint.

Tip: Do not copy/paste your images into Powerpoint. Instead use the 'Insert Picture from File' option in Powerpoint or drag your image file into the program.

Case 1: Image in Powerpoint is **TOO BIG**.

- Simply click on the image in Powerpoint and drag the corner of your image to make it the desired size. Then click 'Format Picture' > 'Compress'.
  - This ensures your file size is not larger than it needs to be and makes it easier to open/load your thesis.

Case 2: Image in Powerpoint is **TOO SMALL**.

**** If you try to drag the image to make it bigger (like above), bad things (interpolation) happen! Don't do it!!** Instead zoom your image up correctly:

- In Photoshop:
  - Open an image.
  - Select *'Image'* menu > *'Image Size'*
  - **Make sure image is at 220 pixel/inch (otherwise go to STEP 1)**
  - ***IMPORTANT*: Check 'Resample Image' > 'Nearest Neighbor'.**
  - Change *'Width'* or *'Height'* to your desired size (resolution should remain the same).
    - If you're not sure what size you need, make it big (~8 inches) and then shrink it in Powerpoint (see 'Case 1' above).
  - Click *OK.*

- In GIMP
  - Open an image.
  - Select *'Image'* menu > *'Scale Image'*
  - **Make sure image is at 220 pixel/inch (otherwise go to STEP 1)**
  - ***IMPORTANT*: Set *Quality: Interpolation* to *'None'.***
  - Change *'Width'* or *'Height'* to your desired size (resolution should remain the same).
    - If you're not sure what size you need, make it big (~8 inches) and then shrink it in Powerpoint (see 'Case 1' above).
  - Click *'Scale'.*

† **In GIMP, to save as 'Tiff', 'PNG', use 'File' > 'Export' instead of 'Save' or 'Save As'.**

STEP 3: Save your figure in Powerpoint and insert it into your document.

Tip: Your image should be smaller than ~5 MB as a .PNG file (~10 MB as a TIFF)– if it is not, your resolution settings are probably wrong).

- Add annotations, shapes, text, graphs, legend to your figure as desired and save as a .PPTX until you're are completely finished

<u>Options for inserting your figure into your thesis:</u>

OPTION A: The easy cheat – you can insert your figure directly into word. This will change the resolution and quality but only a very minor amount:

- Save each .PPTX figure/slide as an individual PDF file ('*Save As'* PDF) and insert (or drag) that PDF file into a word document. Right click on the figure and select 'Format Picture'. Adjust *'Rotation and Scale'* to 100% to get full resolution.
- You might need to adjust word wrap to 'Top and Bottom' in order to center the image.

OPTION B: Using PDFs and Abode Acrobat*– for students who plan to have each figure occupy a separate full page in the thesis.

* Acrobat is on lab computers, but you cannot download it for free from HUIT.

- Save each .PPTX figure/slide as an individual PDF file ('*Save As…*' > 'PDF') and insert that PDF file into a PDF file of your thesis text (instructions here).

NICE WORK. YOU'RE DONE!