High Resolution Images

Selection and Saving

As Capstone Designers, you will have multiple occasions to present your work and accomplishments to the public. At both the Symposium and Summit, teams are tasked with designing impactful presentations and insightful posters that highlight their projects over the course of the academic year. These visual aids are quintessential to explain the project's importance as well as the team's achievements. As such, the importance of selecting and creating high-resolution images should be emphasized.

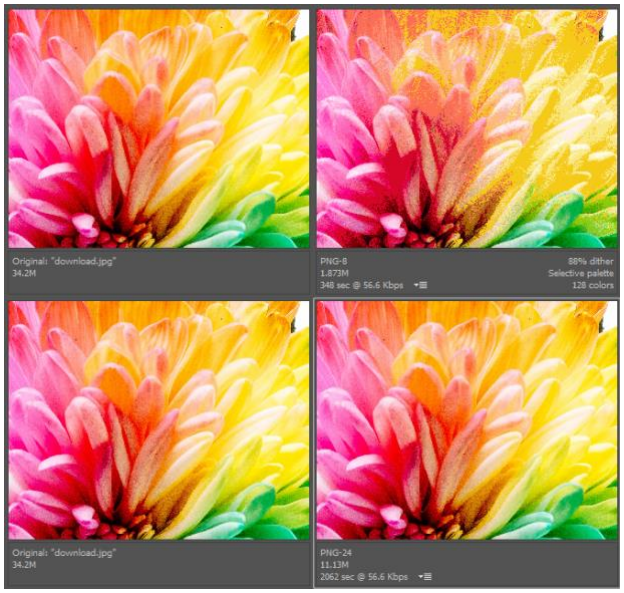
As technologies advance, the appearance of low-quality images detracts viewers from the content represented. These imperfections become a focal point of your work; rather than the challenges overcome and the work performed. Students should avoid using grainy, blotchy, and compressed images when creating visual content.

Image Formats

There are many different image formats to select when designing visual elements of your work. Of these, the most popular are JPG, PNG, GIF, and EPS. They differ in their target purpose, and the quality achievable when using them. **Lossy** formats utilize compression algorithms that reduce the size of images by sacrificing quality. **Lossless** formats still employ compression algorithms but do not lose image data in doing so. This results in a higher-quality image at a reduced size. **Vector** images are designed using mathematical structures such that the size of the image is unrelated to size; a vector image can be scaled to the size of a billboard without a loss of quality!

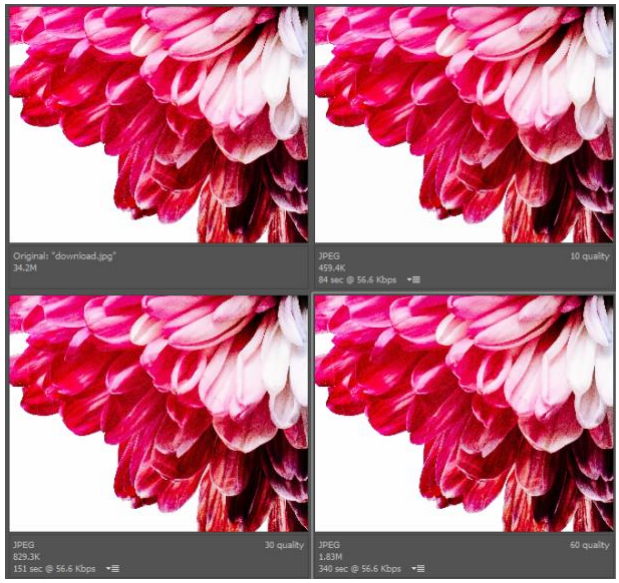
Of these formats, the best choice for capstone projects is **PNG** (Portable Network Graphics) format. PNG also supports the inclusion of an alpha channel; allowing images to be transparent. This is particularly helpful when designing multi-layer elements such as posters. A higher resolution would be **TIFF**.

Below is an image showing the difference between PNG formats. Notice how PNG-8 incorrectly matches the range of colors found in the image. PNG-24 (24-bit color) and the standard PNG format found in photoshop support the full spectrum.



source: https://www.makeuseof.com/tag/save-high-quality-images-photoshop/

In the following image, you can see the differences in quality when using JPG. The image is saved using qualities of 10, 30, and 60:



source: https://www.makeuseof.com/tag/save-high-quality-images-photoshop/

Target Resolutions

To select a high-quality image properly, you must understand the resolution of your presentation media. Modern projectors and televisions output images at a 1080p resolution and a widescreen 16:9 resolution. This corresponds to 1920 pixels vertically and 1080 pixels horizontally. To display an image accurately, the screen must have sufficient pixel-space in both vectors. Displays unable to represent each pixel must sacrifice quality in order to render an image.

In print, the primary factor is the print resolution; denoted as dpi (dots per inch). This is the maximum number of dots the printer is capable of reproducing on the target media (paper, poster-board). A typical poster printer supports at least 1200 dpi. Print files are generally large, and designers should not be concerned with file size when designing a poster; you want as must resolution as possible in the digital format.

Saving and Selecting Images

When designing or selecting images, it is recommended that you aim for a resolution of **300 dpi.** This ensures that the image is of a high quality when converted to print. Saving images at a specific dpi generally requires the dimensions of the image being set to **pixels**, **not inches**.

Once the image is selected, open in a photo editor like GIMP, Inkscape, or Photoshop in order to view the resolution. When satisfied with the image, export it as either a **TIFF** or **PNG**; following prompts in order to save it at the highest quality possible.

When searching for images to use, utilize search options to find the largest or otherwise highest-resolution images. This can be accomplished in Google Image Search by clicking the item "**tools**". In the new toolbar that appears, select "**size"** and then **"large"**. This will return only images that have a larger size. Only decrease the size option if the results are insufficient.

As always, images should royalty-free, and credit should be included wherever appropriate.

Choice of Application

While we provide templates for your posters and posters in various formats, designers should select the proper application for the destination media.

For image modification, designers should avoid simple applications like **Microsoft Paint** or **Paint 3D**. Please refrain from using editing tools on mobile phones as they are generally designed for mobile displays which are significantly smaller than those used in presentations. Rather, it is recommended that you use applications like **Inkscape, GIMP,** and **Adobe Photoshop**. Both Inkscape and GIMP are available for free on Windows, macOS and Linux.

For designing your presentations, it is recommended to use **Microsoft PowerPoint** or **Prezi**. If using open-source solutions like **LibreOffice**, students should test their presentation on whichever display/monitor will ultimately be used. Often, presentations using these programs have scaling or sizing issues that are not present on host machines.

For designing posters, it is recommended to use **Microsoft Publisher** or **Adobe InDesign.** These applications are specifically tailored around designing content for print (both physically and online). Alternatively, **PowerPoint** or **Google Slides** can be used; though students should be mindful of the arrangement, size, and resolution of all images and content used.