Imaging Made Easy

Imaging Essentials

Acquisition, Manipulation, Annotation and Output

with

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Introduction to Digital Images

- Digital images defined
- Work flow
- Acquisition devices
- Editing for specific uses
- Compositing & annotation
- Output devices

images defined

Object type	Characteristics	Examples	Usual file types
Raster objects 	•Pixel based •Described in terms of resolution (dpi) •aka bitmap •Cannot grab object & stretch to resize larger	•Photographs •All images from Scanners Microscopes cameras •All .tif, .jpg & .gif files	•.tif •.jpg •.gif
Vector objects 	•No pixels / no resolution •Mathematical algorithm •OK to grab object & stretch to resize larger	•Illustrations •Text objects •Drawing tool objects •Never .tif, .jpg or .gif file type	•.eps •.ps •.pdf •.ppt, .ai, .cnv
Rasters that were vectors 	•Pixel based •Described in dpi •aka bitmap •Cannot grab object & stretch to resize larger	•Scanned Illustrations •Illustrations that have been 'rasterized' •All .tif, .jpg & .gif files	Often •.tif •.jpg •.gif Occasionally •.eps

Work Flow

- Acquire or create images
- Determine output requirements
- Edit images with Photoshop
  - Crop
  - Image size and resolution
  - Adjust contrast
- Composite and annotate with PowerPoint
- Output

Work Flow: Acquisition

- Acquire or create high resolution master images
  - Flatbed scanners
  - Slide scanners
  - Digital cameras
  - Microscopes and other imaging devices

Work Flow: Acquisition

- Save high resolution, uncompressed master files safely away
- Edit only *copies* of these master files

Work Flow: Output Requirements

The bad news

One size does NOT fit all!

Work Flow: Output Requirements

Before editing images determine the output device requirements

Find this out by reviewing:

- **Resolution, File Type & Color Mode Charts in *Imaging Essentials* guide**
- **Journal or grant submission guidelines**
- **Off-site press file requirements**

Work Flow: Output Requirements

Before editing images determine the output device requirements

Know the following:

- **Image Size**
- **Image Resolution**
- **Color Mode**
- **File Format**

Output Device \ Art Work Type	Photo Images Bitmap Images Raster Images (with no text or vector objects within)	Raster images that contain Line Art Illustrations Vector Objects Cartoons Text
PowerPoint On-screen Presentation **LCD Data Projector** **Computer Monitor/Display** **Web Site** *Physical Dimension of PowerPoint On-Screen Presentation: 7.5" x 10" otherwise physical dimension of projector or monitor = pixel dimension of device*	100 dpi	200 dpi
Laser Printer **(LaserJets & LaserWriters)** *Printable Area varies*	200 dpi	300-600 dpi
Photo- Quality Inkjet *Printable Area = as low as 8" x 8"*	150 dpi (plain paper) 180 or 240 or 320 dpi (photo paper)	300-600 dpi
Photo-Quality Printer (i.e.: Fujix, dye sublimation printers) *Printable Area = 8" x 10.3" or 8" x 5"*	300-400 dpi (usually 320 dpi)	600-1200 dpi
Poster Printer *Printable Area = 24" x 48" or 52" x 74"*	125-200 dpi start at 125dpi	300 dpi
Slide Maker **Film Recorder** *Printable Area = 4096 x 2731 pixels or with PowerPoint 7.5" x 11.25"*	If inserting into PowerPoint 100 dpi	If inserting into PowerPoint 225 dpi
	If imaging directly from Canvas or Photoshop the pixel dimensions should be 4096 x 2731 *(If you make images smaller than these pixel dimensions, the film recorder will 'stretch' the image to fit the slide and it will look terrible.)*	

Work Flow: Image Editing

Get organized- create a project folder

- ***Copies* of the master images for editing**
- **Composite document**

Additional tips

- **After editing your images, it is useful to give the file an informative name like gel_2x2_125dpi.tif**
- **Include .extension in file name for cross-platform compatibility**

Work Flow: Image Editing

Photoshop, Canvas, GraphicConverter

- **Crop**
- **Adjust brightness & contrast**
- **Image size**
- **Color mode**
- **File type**
- **Resolution**

Versatility and Compatibility

Save your edited images in file formats that are versatile for cross-platform and cross-application use

Best:

- **.jpg or .tif *for photos and scans***
- **.jpg or .gif *for bitmapped illustrations and cartoons***

Work Flow: Compositing and Annotating

PowerPoint

- **Assemble single or multiple images to create a figure**
- **Add titles, captions and other annotations**

Work Flow: Output

PowerPoint is infinitely versatile

- **Prints to any output device**
- **Creates files that maintains image integrity (vectors stay vectors)**
  - **.eps**
  - **.ps**
  - **.pdf**
- **Creates common bitmap formats**
  - **.jpg**
  - **.tif**

Work Flow: Output

PowerPoint output options

- **Given the choice, choose better quality file formats that keep vector objects looking sharp**
  - **.eps**
  - **.ps**
  - **.pdf**
- **Even high-resolution bitmap formats will rasterize annotations so they appear 'jaggedy'**
  - **.jpg**
  - **.tif**

resources

Brown Bag Handouts	countway.harvard.edu/imaging/handouts.shtml
Other Imaging Guides	countway.harvard.edu/imaging/guides.shtml
PowerPoint FAQ	www.rdpslides.com/pptfaq/
PowerPoint Tips	www.powerpointbackgrounds.com /powerpointtips.htm
More PowerPoint Tips	www.echosvoice.com/
PowerPoint classes at HMS	www.hms.harvard.edu/it/training/schedule.html
PowerPoint classes at Harvard University	atwork.harvard.edu/training/ctd/

Questions? Comments?

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