


2011

Analyzing Digital Images (ADI) Resources

Rob Snyder

University of Massachusetts - Amherst, robsnyder1943@gmail.com

Follow this and additional works at: http://scholarworks.umass.edu/stem_digital

 Part of the [Analytical Chemistry Commons](#), [Civil and Environmental Engineering Commons](#), [Environmental Chemistry Commons](#), and the [Physics Commons](#)

Snyder, Rob, "Analyzing Digital Images (ADI) Resources" (2011). *STEM Digital*. 21.
http://scholarworks.umass.edu/stem_digital/21

This Article is brought to you for free and open access by the STEM Education Institute at ScholarWorks@UMass Amherst. It has been accepted for inclusion in STEM Digital by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

Analyzing Digital Images (ADI) Resources

Upload a Photograph onto a Computer. There are many ways to upload photographs from a camera to a computer. .

One example: For an older PC using Windows XP:

- Connect the camera to the computer.
- Select Microsoft Scanner and Camera Wizard. Click OK.
- Open Scanner and Camera Wizard. Click Next
- Clear All Pictures. Then Select a Picture. Click Next,
- Name the Picture.
- Select a location for the photograph and Click Next.

Another example: For a recent MacBook:

- Connect the camera to the computer.
- Open iPhoto and Select a photo.
- Name the photo
- Click “Import Photo” (Decide if you want to delete the photo from the camera)
- Right Click to copy and paste into a folder of photos.

Install ADI on your computer: There will be three icons.

- Analyzing Digital Images
- Digital Image Basics
- Color Basics

Click the “Analyzing Digital Images” Icon to get to the Introduction

The Introduction to ADI page that has 6 buttons.

- Spatial Analysis:
- Enhance Colors
- Mask Colors
- Time Series
- Example (Includes maps of forest growth)
- About ADI: This button provides descriptions of ADI Resources. Click the “Close” button when done to return to the screen with 6 buttons.

Note: Help is available in each ADI window.

Use ADI to analyze colors detected by a digital camera.

Click the **Spatial Analysis** button in **Introduction to ADI**

- Your computer's desktop window appears.
- Select a photograph from the desktop of a file on the desktop.
- If the Trim Image message appears, Click "Yes".
- Select the Trim Option: "Full Image at Selected Resolution (RECOMMENDED)".
- Click the "Trim and Use Image" button.
- When the Pixel Calibration window opens. Click "None".
- Select one of **6 Measurement Tools** from the drop down menu.

The Line Tool: You can draw a line across an image and detect changes in the intensities of red, green, and blue light.

- Select "Line Tool" and then move cursor to a Starting Point on the Photo
- Press down using left click to move the line to an end point and release.
- You can collect and record data about the start and end point of the line and the average color intensities of the line.

Create a graph of colors along a line. Create a graph that shows changes in the intensities of red, green, and blue light along a line that you draw across a photograph.

- Use the File Menu in the upper left corner.
- Select "Graph Colors" to generate a graph.
- You can turn R or G or B or Average intensity on and off.

Collect Data from Graphs

- Collect data directly from the graph displayed on the computer monitor by ADI
- Save a Screen Capture of the active window and paste into a document.
- Windows 7 has a snipping tool in Accessories that can copy and pasted into a document.
- Save a Graph as a JPEG or Data File

The Rectangle Tool: This feature analyzes average intensities of red, green, and blue light in the rectangle area of a photograph.

- Select the Rectangle Tool
- Press down using left click to draw a rectangle on the photograph.

Create a color histogram of colors in the rectangle:

- Use the File Menu.
- Select "Graph Colors".
- You can turn RGB or the Average Line on and off for the entire photograph and/or for the area defined by the rectangle.

Collecting Data from Histograms

- Collect data directly from the graph or histogram displayed on the computer monitor by ADI
- Save a Screen Capture of the active window and paste into a document.
- Windows 7 has a **snipping tool** in Accessories (in All Programs) that can be used to select any portion of a view on the screen and paste into a document.
- Save a Histogram as a JPEG or Data File

The Pixel Tool:

- You can move the cursor to obtain data about colors intensities of various pixels.
- You can change the number of pixels in an image and observe what happens to the image.
- To learn more about pixels use the **Navigation** option to navigate to **Digital Image Basics** and click on the Pixels button at the top of the page. **Note:** With a PC, you may need to quit if you want to return to **Digital Image Basics**.

A Polygon Tool: Draw a polygon on an area of an image.

Note: You can the calculate Area of a Rectangle or Polygon

- Open Picture
- Trim Image using the recommended trim option
- Select **“Scale Present in Image”** in the Pixel Calibration window.
- Draw a line along the ruler for a specific length.
- Enter the length of the line and the units of length. Click **“Done”**.
- Draw a rectangle or polygon.
- The area of the rectangle polygon will be indicated

The Angle Tool: Measure the angle formed by two feature of an image.

- For example: the angles of the veins in a leaf.

The Path Tool:

- This tool creates a path across an image with multiple points. An example would be a zigzag line across an image.
- The path across the image can be adjusted.
- A graph of colors along all segments of the path can be produced.

Use the **“Navigation”** option (to the right of **“file”**) to go:

- **“Enhance Colors”**: You can modify the colors of a digital image.
- **“Mask Colors”**: You can highlight a range of colors or study color relationships.
- **“Time Series”**: You can study a series of photographs taken at a number of different times.

Use ADI to Learn About Colors

- Quit **Overview** and find the **Digital Image Basics** and **Color Basics** Icons

Digital Image Basics: 7 buttons provide information about digital images and how they can be analyzed.

- Introduction
- Pixels: See example activity in the next section.
- Colors
- Data in Images
- False Color
- Check Color
- About

For Example:

- Click on “Pixels”
- Choose a “Mystery Picture” or one of your saved photographs.
- Change the number of pixels in the picture by changing the resolution.

Color Basics: 7 buttons provide opportunities to experiment with colors of light and colors of paints.

- Compare Colors: See example activity in the next section.
- Make Colors: See another example activity below.
- Play with Colors
- Test Yourself
- Color Spaces
- Check Display’s Color
- About

Compare colors.

- The primary and complementary colors of light and pigments will appear in the window.
- Click the “Compare Colors” tab.
- Choose a color from the Palette on the left.
- Choose a color from the Palette on the right.
- Try other color combinations.

Make Colors

- Click the “Make Colors” tab.
- RGB primary light colors are the default setting.
- Mix 100% red and 100% green to produce pure yellow.
- Select the CMY primary pigment colors.
- Try other combinations of colors and intensities

Develop an Activity: Write a step-by-step procedure for another ADI Resource.