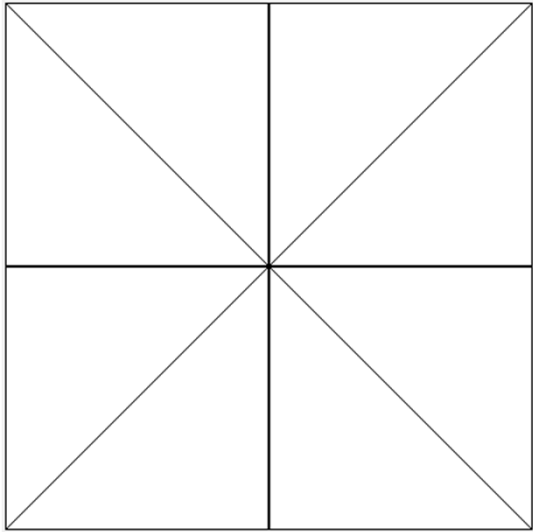
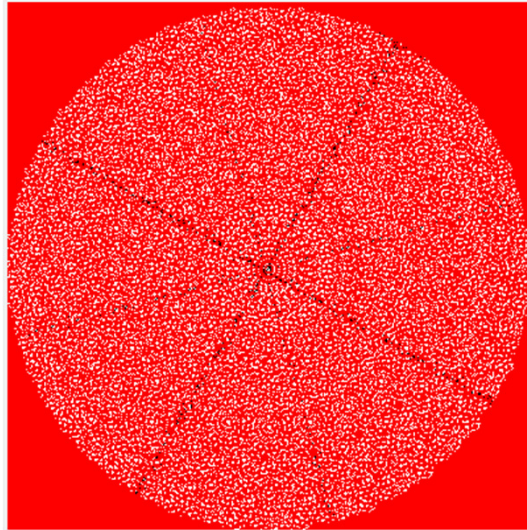




Vanishing Pixels
Image Rotation Demo App, Evan Golub



Honors 208W

Fall 2011

Straightening using GIMP

Straightening an Image

When shooting freehand, or even with a tripod, we sometimes don't position the camera perfectly aligned to the desired vertical/horizontal.

By rotating the image on the canvas, we can correct this.

When rotating, we will likely be forced to crop the image or we would need to expand the canvas and have blank areas in each corner.

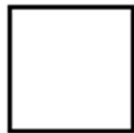
Losing Information

NOTE: Rotating anything other than multiples of 90° is a lossy operation no matter what raster format you are using.

The problem comes from the fact that for angles that are not multiples of 90° , there will be pixels that no longer have a logical location on the x,y grid provided. This means some pixels will be “lost” in rotation.

New pixels will also need to be generated for some x,y positions for non- 90° multiples.

The following shows a square rotated 15° at a time, many times.



Straightening by Freehand Rotation

Operations such as cropping, resizing, rotations, skewing, etc. are known as transformation operations.

Mathematical functions are applied to the image data to accomplish these operations.

One way to adjust the alignment of an image is to perform a freehand rotation.

Go to the **Tools** menu, then to the **Transform Tools** sub-menu, and select **Rotate**

- Move the thumb on the slider to change the rotation angle's value and interactively see a preview of the effect of that rotation.

Straightening to a Line

We can also select a line that we would like to be straight along the vertical or horizontal, and straighten to that.

Go to the **Tools** menu and select **Measure**

- Click and drag to draw a line across a straight line in the image that you want to use to set the new vertical or horizontal alignment of the image.
- If the you are attempting to set a new horizontal, then the angle of the line is the amount you want to rotate the image.
- If the you are attempting to set a new vertical, then you want to subtract the angle of the line you drew from 90 to get the amount you want to rotate the image.

Go to the **Tools** menu, then to the **Transform Tools** sub-menu, and select **Rotate**

- Specify the angle of rotation that you previously determined.

Straightening to a Diagonal

We can also select a line that we would like to be along the diagonal, and straighten to that.

Again use **Tools-Measure** to determine the angle of a line you draw, but now determine how much rotation would be required to bring that line to (for example) a 36.87° angle.

- When I take **SundialToEdit.jpg** and draw a line from the tip towards the base, I get an angle of 72.34° .
- I know I want to spin it around almost -180° , but now I know that I should only rotate it -144.53° [$-180 + (72.34 - 36.87)$].

Again, once determining our angle, we to the **Tools** menu, then to the **Transform Tools** sub-menu, and select Rotate and specify the angle of rotation that we have determined.

Some resources:

[http://en.wikipedia.org/wiki/Transformation_\(mathematics\)](http://en.wikipedia.org/wiki/Transformation_(mathematics))