NAME

imshear - shear an image

SYNOPSIS

imshear [*options*] *infilename outfilename*

DESCRIPTION

imshear reads each image in the input file, shears it in either the X or Y direction, then writes it to the output file. The input and output image file formats may be different.

OPTIONS

imshear has a variety of options in the following five categories:

File Selection	What input and output files to use
Format Selection	What image file format to use
Format Control	What variant of a file format to generate
Standard	Standard generic options on all SDSC tools
Shearing	How the image can be sheared
Filling	How to fill in blank corners in the sheared image

File Selection, *Format Selection*, *Format Control*, and *Standard* options are common to all SDSC image tools and are discussed in depth in the man page for imconv(1IM).

All options can be abbreviated to the first few unique characters.

Shearing Options

-xshear *degrees*

The -xshear option selects the number of degrees by which the image is to be sheared along the X-axis (horizontal axis). Degree values may be positive or negative floating point angles measured relative to the Y-axis (vertical axis). Using the right-hand rule, positive values rotate the vertical edge of the image counter-clockwise to create a left-ward horizontal shear. Negative shear values rotate the vertical edge of the image clock-wise to create a right-ward horizontal shear.

-yshear *degrees*

The -yshear option selects the number of degrees by which the image is to be sheared along the Y-axis (vertical axis). Degree values may be positive or negative floating point angles measured relative to the X-axis (horizontal axis). Using the right-hand rule, positive values rotate the horizontal edge of the image counter-clockwise to create an upward vertical shear. Negative shear values rotate the horizontal edge of the image clock-wise to create a downward vertical shear.

Shear angles must be between -90 and +90. However, as shear angles approach +90 and -90, the image becomes stretched longer and longer and thinner and thinner, image alias artifacts become noticable and image dimensions approach infinity in one direction and 0 in the other.

If neither -xshear or -yshear are given, input images are not sheared at all and imshear just copies the input images to the output untouched.

Filling Options

Shearing an image rotates one edge of the image, but keeps the other edge fixed. The resulting parallelogram has one axis-aligned edge and one non-axis-aligned edge. Pixel storage, however, must be into axis-aligned rectangles (horizontal and vertical edges only). So, imshear copies the sheared image into a larger background axis-aligned rectangle and stores the result to the output file.

The placement of the sheared image into a background axis-aligned rectangular image leaves the two triangular image corners empty. These empty corners may be filled in using a variety of fill options similar to those found on imfill.

Fill options allow specific image channels to be filled with single values or a range of values in a horizontal or vertical gradient.

Fill values are selected using one or more of the following fill options:

Option	Fill each pixel's
-red *range*	red component
-green *range*	green component
-blue *range*	blue component
-mono *range*	monochrome component
-index *range*	color index component
-hue *range*	hue component
-saturation *range*	saturation component
-intensity *range*	intensity component
-alpha *range*	alpha compoent

Multiple fill options may be given, as long as color spaces are not mixed. For instance, -index for filling color indexes is incompatible with -red for filling the red component of RGB triplets. Likewise, -hue for filling pixels based upon an HSI color space hue value is incompatible with -blue for filling with blue in the RGB color space. See the imintro(3IM) man page for a description of the RGB and HSI color spaces.

If imshear is directed to fill the alpha component of an image that does not have an alpha channel, an alpha channel is created and initialized to 0s (transparent).

If imshear is directed to fill a pixel component that does not exist in the input image (except for alpha), an error is reported.

Input image components not selected for filling by a fill option are initialized to zeroes.

Each of the fill options can accept an argument giving a single value, or range of values with which to fill. Value *range* syntax takes any one of the following forms:

range	Fill with values of
n	*n* only.
n-	*n* through the maximum legal value for the component.
n-m	*n* through *m*.

There is no space between *n*, the dash, and *m*. *n* need not be a value less than *m*.

When filling with a single value, the entire background rectnagle is set to the same value.

When a range of fill values are given, such as -red 0-255 or -intensity 0.6-0.2, the fill region will be filled with a gradation, or ramp, as selected by the -graduate option's argument:

option	Meaning
-graduate none	Fill with a constant value
-graduate horizontal	Fill with a horizontal ramp (default)
-graduate vertical	Fill with a vertical ramp

none, horizontal, and vertical may each be abbreviated to the fewest unique letters.

The horizontal ramp for a graduated fill starts from the first fill value at the left edge of the image and goes to the second fill value at the right edge. The vertical ramp for a graduated fill goes from the first fill value at the top edge of the image to the second fill value at the bottom edge.

NOTES

imshear's fill options may used for a variety of effects. In the simplest case, the fill options may be set to fill the image corners with a color that matches the background color of the sheared image.

In a more complex use of imshear's fill options, the background corners may be set to transparent alpha channel values. Then, using the Image Tools digital compositor imcomp(1IM), the sheared image can be composited onto a background image of arbitrary complexity.

For notes regarding file format conversion and standard image tool options, see the man page on imconv(1IM).

Error messages are reported to stderr.

EXAMPLES

Shear an image 45 degrees along the X-axis:

```
imshear image.rgb -xshear 45 sheared.rgb
```

Shear the image 45 degrees in the other direction along the X-axis:

```
imshear image.rgb -xshear -45 sheared.rgb
```

Shear an image 30 degrees along the Y-axis and fill in the corners with RGB values of (255,255,0) and an alpha value of 128:

```
imshear image.ras -yshear 45 -red 255 -green 255 -blue 0 -alpha 128 sheared.ras
```

SEE ALSO

imcopy(1IM), imflip(1IM), imroll(1IM), imshear(1IM), imscale(1IM), ImVfbRotate(3IM), ImVfbXShear(3IM), ImVfbYShear(3IM)

For information on SDSC's image library, see imintro(3IM).

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See the individual file format man pages for the authors of the underlying format read and write code. The names of these man pages begin with the letters "im" followed by the format name. For example, the name of the TIFF man page is imtiff. To display it, enter man imtiff.

CONTACT

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