

NAME

immono - Convert an image to monochrome

SYNOPSIS

immono [options] infilename outfilename

DESCRIPTION

immono converts an input image to monochrome, then writes it to an output image file. If the input file contains multiple images, immono converts each one and writes it to the output file. The input and output image file formats may be different.

OPTIONS

immono 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
Manipulation	How the image can be manipulated

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.

Manipulation Options

Conversion of an input image to monochrome is a two-step process:

1. Convert the color image to grayscale.
2. Convert the grayscale image to monochrome.

In step 1, conversion from color to grayscale computes the gray value for each pixel using the NTSC Y equation:

$$\text{Gray} = 0.30 * R + 0.59 * G + 0.11 * B$$

In step 2 conversion from grayscale pixel values (0-255) to monochrome pixel values (0 or 1) can use either a simple thresholding technique or it can use dithering. The default is the former; pixel values equal to or higher than the threshold are considered white. Pixel values below the threshold are considered black.

By default, the threshold is set at 127. This threshold may be selected explicitly using -threshold followed by a positive integer.

If dithering is desired, then step 2 is different. By giving the -dither option, dithering will be used. Dithering, in this case, is a mechanism for arranging black and white pixels in various patterns in order to give the appearance of different shades of grey. (More generally, dithering is the process by which many colors can be represented by fewer colors.)

immono uses Floyd-Steinberg dithering. The Floyd-Steinberg algorithm works like this: The image is traversed from left to right and top to bottom. If a given pixel has a value of 255 or greater, then this pixel will be set to white (i.e. 255), and the difference (i.e. the pixel value minus 255) will be propagated to the neighboring pixels as follows: Seven sixteenths of the error goes to the right, three sixteenths to the bottom-left, five-sixteenths to the bottom, and one-sixteenth to the bottom-right.

```
----  xx   7/16
3/16  5/16  1/16
```

If the value of the pixel is less than 255, then the value of the pixel will be propagated in the manner described above, and the pixel will be set to black. (i.e. 0)

The idea behind Floyd-Steinberg dithering is to allow the image to be dithered with a single top-to-bottom, left-to-right pass.

NOTES

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

To convert an RGB Alias pix file image to monochrome and store it in a Sun ras file, enter any of the following command lines:

```
immono picture.pix picture.ras
or
immono -informat pix picture.pix -outformat ras picture.ras
or
immono -informat pix - picture.ras < picture.pix
or
immono -informat pix picture.pix -outformat ras - > picture.ras
or
immono -informat pix - -outformat ras - < picture.pix > picture.ras
or
cat picture.pix | immono -informat pix - -outformat ras - | cat > picture.ras
```

SEE ALSO

`imconv (1IM)`, `imfile (1IM)`, `imformat (1IM)`, `imgray (1IM)`, `ImVfbToMono (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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