

**The scientific image processing world :**

*Numfocus projects:*

Skikit-image: general image processing in Python

ITK: segmentation and registration algorithms for medical imaging data formats including Digital Imaging and Communications in Medicine (DICOM), MRI, CT, and ultrasound.

*Also strong and supported:*

Pillow /PIL , Opencv, ImageJ

Image-magick

Mahotas

SimpleITK

Image(Octave)

Magick(R)

Scipy (segmentation, convolution, reading, lots of basics are there)

Tensorflow(yes, really, tf.io and tf.image modules)

*Niche and nice:*

**Kitware stuff:** 3D slicer (visualize your optical imaging, MRI, CT, and ultrasound data), Lidarview (look at Lidar data in read time), Paraview (builds interactive visualizations), VTK (supports meshes, volumes and composites)

**Other supported stuff:** Libvips, CleanX ,

*Best languages for professional work*:

C +/- CUDA, Octave, J language (a terse mathematical approach to arrays, unfortunately used by about 20 people as far as I can see), *not Python, things like opencv have python bindings*

*Super useful websites:*

<https://imagescience.org/> (tutorials, news, orgs and [Image.sc Forum](https://forum.image.sc/) (scientific community image forum))

*Free software:* GIMP, ImageJ, Meshmixer

 

**PIL/pillow image cheat sheet:**

1. Why PIL /pillow? Old is gold. Or maybe newer is better. Pillow is actually the newer heir to PIL, originally a fork off the older library. Support for the oldPIL got discontinued years ago, so we recommend pillow. The Pillow library supports **a lot** of image formats
2. How PIL/Pillow?

Step 1: our backbone imports for images:

import numpy as np

from matplotlib import pyplot as plt

from PIL import Image

Step 2: Basic syntax for basic operations using pillow:

Read in an image with PIL/Pilllow:

our\_image = Image.open(pict1) (this is PIL)

Split image to channels:

Red, green, blue = our\_image.split() (PIl has special function)

Get info on your image:

Our\_image.mode, our\_image.format, our\_image.size, our\_image.width, our\_image.height, image.info

NB: Image.info will give you a dictionary.  
{'jfif': 257, 'jfif\_version': (1, 1), 'dpi': (300, 300), 'jfif\_unit': 1, 'jfif\_density': (300, 300), 'exif': b"Exif\x00\x00MM\x00\*\x00\x00\x00...

Pillow allows many basic operations like blurring, resizing and so on also possible in skimage. PIL/low has a unique kind of image object with its own methods.