Resampling a numpy array representing an image

I am looking for how to resample a numpy array representing image data at a new size, preferably having a choice of the interpolation method (nearest, bilinear, etc.). I know there is

```
scipy.misc.imresize
```

which does exactly this by wrapping PIL's resize function. The only problem is that since it uses PIL, the numpy array has to conform to image formats, giving me a maximum of 4 "color" channels.

I want to be able to resize arbitrary images, with any number of "color" channels. I was wondering if there is a simple way to do this in scipy/numpy, or if I need to roll my own.

I have two ideas for how to concoct one myself:

- a function that runs `scipy.misc.imresize` on every channel separately
- create my own using `scipy.ndimage.interpolation.affine_transform`

The first one would probably be slow for large data, and the second one does not seem to offer any other interpolation method except splines.

python image-processing numpy scipy python-imaging-library

edited Aug 30 '15 at 21:52

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asked Nov 5 '12 at 23:56

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Have you looked at `scipy.interpolate.griddata` ? link – Isaac Nov 6 '12 at 0:33

Looks like a great function, but it's for completely unstructured data, which will run a much more time-consuming algorithm than what I need. I have looked at `interp2d` , but not only is it extremely buggy, but I'm not even sure if it will correctly downsample data. – Gustav Larsson Nov 6 '12 at 1:26

4 Answers

Based on your description, you want `scipy.ndimage.zoom` .

Bilinear interpolation would be `order=1` , nearest is `order=0` , and cubic is the default (`order=3`).

`zoom` is specifically for regularly-gridded data that you want to resample to a new resolution.

As a quick example:

```
import numpy as np
import scipy.ndimage

x = np.arange(9).reshape(3,3)

print 'Original array:'
print x

print 'Resampled by a factor of 2 with nearest interpolation:'
print scipy.ndimage.zoom(x, 2, order=0)


print 'Resampled by a factor of 2 with bilinear interpolation:'
print scipy.ndimage.zoom(x, 2, order=1)


print 'Resampled by a factor of 2 with cubic interpolation:'
print scipy.ndimage.zoom(x, 2, order=3)
```

And the result: