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Image Handling

```
1 from matplotlib.pyplot import subplots, show
2
3 from matplotlib.image import imread
```

```
1 image = imread('fig/Cerebellum.jpg')
2
3 fig, ax = subplots()
4
5 ax.imshow(image);
6
7 show()
```

```
1 image.shape
```

```
1 (154, 327, 3)
```

```
1 image[0, 0]
```

```
1 array([255, 255, 255], dtype=uint8)
```

```
1 fig, ax = subplots()
2
3 ax.imshow(image[50:70, 60:100]);
4
5 ax.set_xticklabels();
6 ax.set_yticklabels();
7
8 show()
```

```
1 fig, ax = subplots()
2
3 ax.imshow(image[:, :, 2], cmap='gray');
4
5 ax.set_xticklabels();
6 ax.set_yticklabels();
7
```

```
8 show()
```

```
1 layer = 2
2
3 fig, ax = subplots()
4
5 ax.hist(image[:, :, layer][image[:, :, layer] < 255].ravel(), bins=500)
6     ;
7 show()
```

```
1 image.size
```

```
1 151074
```

```
1 from PIL import Image
2
3 image = Image.open('fig/Cerebellum.jpg')
4
5 fig, ax = subplots()
6
7 ax.imshow(image);
8
9 show()
```

```
1 type(image)
```

```
1 <class 'PIL.JpegImagePlugin.JpegImageFile'>
```

```
1 image.show()
```

```
1 image.entropy()
```

```
1 5.594248793777234
```

```
1 image.rotate(-90, expand=True)
```

```
1 <PIL.Image.Image image mode=RGB size=154x327 at 0x7FD1CFE09090>
```

Image Masking

```
1 from matplotlib.image import imread
2 from matplotlib.pyplot import subplots, show
```

```
1 image = imread('fig/rose.jpg')
2
```

```
3 fig, ax = subplots()
4
5 ax.imshow(image);
6
7 show()
```

Transpose Image

```
1 image.shape
```

```
1 (3648, 2736, 3)
```

```
1 image_t = image.transpose((1, 0, 2))
2
3 fig, ax = subplots()
4
5 ax.imshow(image_t)
6
7 show()
```

Only red Component

```
1 fig, ax = subplots()
2
3 ax.imshow(image_t[:, :, 0]);
4
5 show()
```

Histogram of Red Component

```
1 fig, ax, = subplots()
2
3 ax.hist(image_t[:, :, 0].ravel(), bins=500);
4
5 show()
```

Masking the Red Component

```
1 threshold = 90
2
3 mask = image_t[:, :, 0] < threshold
4
```

```
5 image_masked = image_t[:, :, 0] * mask
6
7 fig, ax = subplots(ncols=3)
8
9 ax[0].imshow(image_t[:, :, 0], cmap='gray')
10 ax[1].imshow(mask, cmap='gray')
11 ax[2].imshow(image_masked, cmap='gray');
12
13 fig.tight_layout()
14
15 show()
```

False Colour

```
1 fig, ax = subplots()
2
3 ax.imshow(image_masked);
4
5 show()
```

Apply mask to all layers

Choose grey value for background

```
1 image_new = image_t.copy()
2
3 grey_value = 100
4
5 image_new[mask, :] = grey_value
6
7
8 fig, ax = subplots()
9
10 ax.imshow(image_new);
11
12 show()
```

```
1 fig.savefig('fig/rose_masked.png', format='png')
```

Keypoints

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