

PCA

September 16, 2018

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In [2]: import numpy as np
        from PIL import Image
        import matplotlib.pyplot as plt

In [3]: def Mean_centering(X):
        X = X.astype('float')
        for i in range(len(X)):
            X[i] = X[i] - np.mean(X[i])
        print(np.mean(X[0]))
        return X

In [4]: pic = Image.open('wildlife-bears2.jpg')
        img = (np.array(pic))

In [5]: a,b,c = img.shape
        print(a,b,c)

359 550 3

In [6]: Flat = img.reshape((a*b,c))
        Flat = Flat.astype('float32')

In [7]: Flat = Flat.T
        Flat.shape

Out[7]: (3, 197450)

In [8]: Flat = Mean_centering(Flat)

-1.805631416029313e-15

In [9]: Cx = (np.matmul(Flat,Flat.T)/(len(Flat[0])))

In [10]: Lx,Ex = np.linalg.eig(Cx)

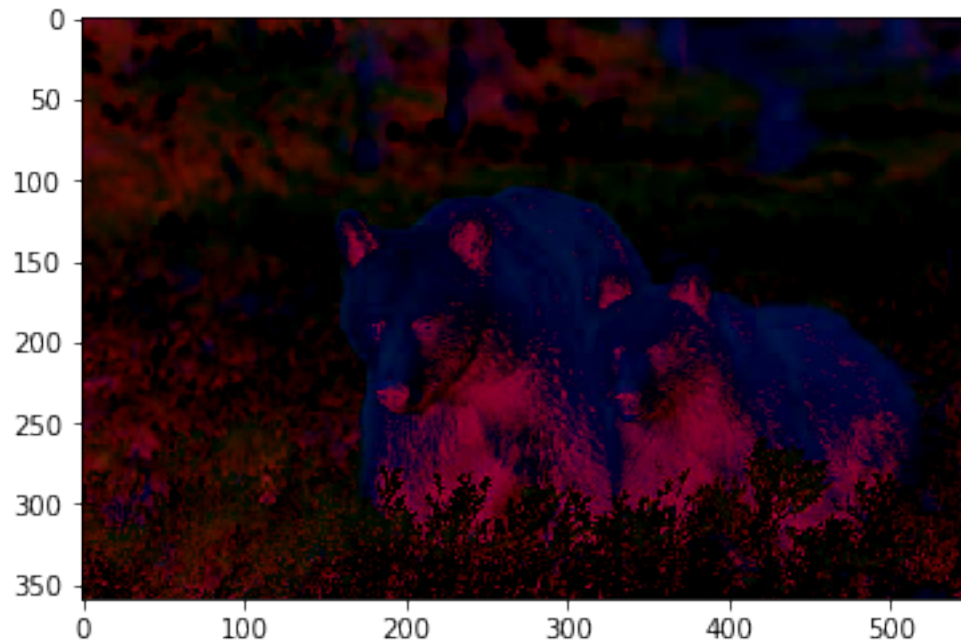
In [11]: Y = np.matmul(Ex.T,Flat)
        Y = Y.T
        Y = Y.reshape(img.shape)
```

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In [12]: Y = Y.astype(int)
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In [13]: plt.imshow(Y)
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Clipping input data to the valid range for imshow with RGB data ([0..1] for floats or [0..255]

```
Out[13]: <matplotlib.image.AxesImage at 0x7f3d10ee7588>
```



```
In [14]: plt.imshow(pic)
```

```
Out[14]: <matplotlib.image.AxesImage at 0x7f3d10e81780>
```

