steganography

April 28, 2019

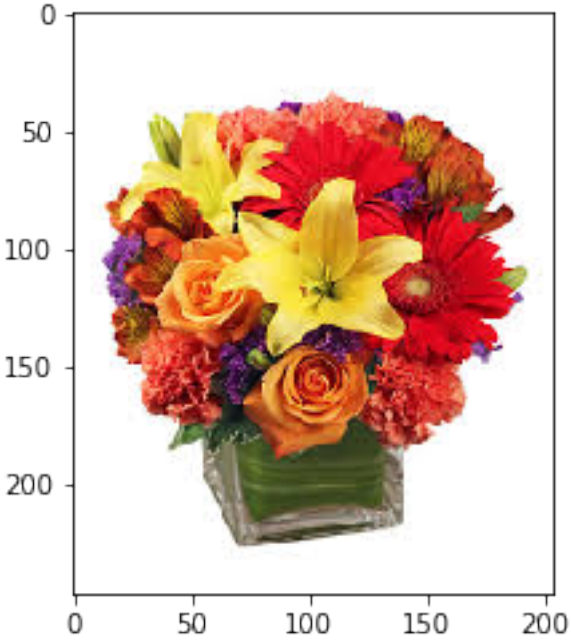
In [1]:
```
# STEGANOGRAPHY.py
import numpy as np
import cv2
import matplotlib.pyplot as plt
```

In [3]:
```
img = cv2.imread('Echoes1.jpg')
img = np.array(img)
img[:,:,0],img[:,:,2] = img[:,:,2],img[:,:,0].copy()
plt.imshow(img)
```

Out[3]:
```
<matplotlib.image.AxesImage at 0x11eff2048>
```

In [4]:
```
img2 = cv2.imread('flower.jpeg')
img2 = np.array(img2)
img2[:,:,0],img2[:,:,2] = img2[:,:,2],img2[:,:,0].copy()
plt.imshow(img2)
```

Out[4]: <matplotlib.image.AxesImage at 0x129c99ef0>



In [5]:
```
print(img.shape)
print(img2.shape)
```

```
(3000, 4000, 3)
(247, 204, 3)
```

In [6]:
```
# function for steganography
def steganography(img, img2):
    for k in range(3):
        for i in range(img2.shape[0]):
            col = 0
            for j in range(img2.shape[1]):
                c = 0
                while c != 8:
                    if img[i][col][k] % 2:
                        img[i][col][k] -= 1
                    img[i][col][k] += img2[i][j][k] % 2
                    img2[i][j][k] //= 2
                    col = col + 1
                    c = c + 1
    return img
```

In [7]:
```
steg = img.copy()
to_hide = img2.copy()
steg = steganography(steg,  to_hide)
```

In [8]:
```
plt.imshow(steg)

steg2 = steg.copy()
steg2[:, :, 0], steg2[:, :, 2] = steg2[:, :, 2], steg2[:, :, 0].copy()
cv2.imwrite('STEGANOGRAPHY.png', steg2, [0]) # for preserving quality
```

Out[8]: True

In [9]:
```
# function for extracting image
def extraction(steg, shape):
    ext = np.zeros(shape, dtype = int)
    for k in range(3):
        for i in range(shape[0]):
            for j in range(shape[1] * 8):
                if j % 8 == 0:
                    pro = 1
                else:
                    pro *= 2
                ext[i][j // 8][k] += steg[i][j][k] % 2 * pro
    return ext
```

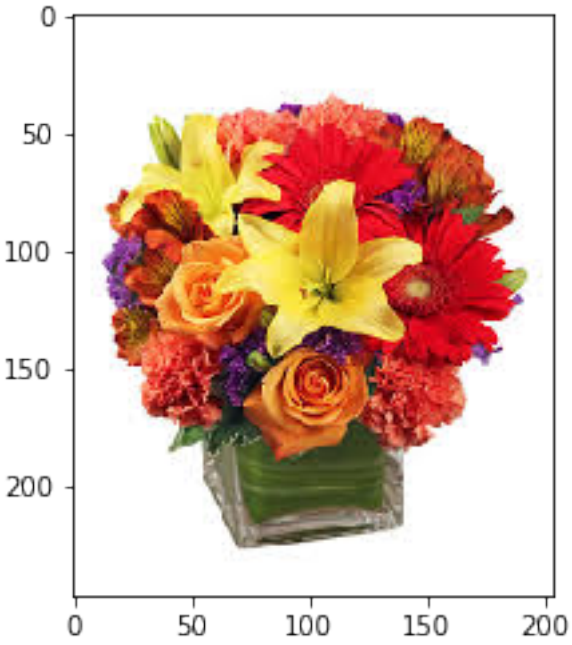
In [10]:
```
steg_img = cv2.imread('STEGANOGRAPHY.png', cv2.IMREAD_COLOR)
steg_img = np.array(steg_img)
steg_img[:, :, 0], steg_img[:, :, 2] = steg_img[:, :, 2], steg_img[:, :, 0].copy()
plt.imshow(steg_img)
```

Out[10]: <matplotlib.image.AxesImage at 0x12edb4c88>

In [11]:
```
# Extracting from steganographic image
extract = extraction(steg_img, img2.shape)
```

In [12]:
```
plt.imshow(extract)
```

Out[12]:
```
<matplotlib.image.AxesImage at 0x13614ba90>
```



In [ ]: