Image Reading and Processing

```
[44] import matplotlib.pyplot as plt
     from PIL import Image
```

```
[48] PEG = Image.open(r'/content/PEG.jpg')
     PEG
```

```
50] AI = Image.open(r'/content/AI.jpg')
    AI
```

```
[51] type(AI)
```

```
PIL.JpegImagePlugin.JpegImageFile
def __init__(fp: StrOrBytesPath | IO[bytes], filename: str | bytes |
None=None) -> None

/usr/local/lib/python3.11/dist-packages/PIL/JpegImagePlugin.py
Base class for image file format handlers.
```

```
ai_arr = np.asarray(AI)
ai_arr
```

```
array([[[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 44,  76,  91],
        [ 44,  76,  91],
        [ 44,  76,  91]],

       [[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 45,  77,  92],
        [ 45,  77,  92],
        [ 45,  77,  92]],

       [[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 45,  77,  92],
        [ 45,  77,  92],
        [ 45,  77,  92]],

       ...,

       [[246, 248, 247],
        [244, 248, 247],
```

```
...,

[[246, 248, 247],
 [244, 248, 247],
 [244, 248, 249],
 ...,
 [ 29,  51,  64],
 [ 29,  51,  64],
 [ 29,  51,  64]],

[[238, 239, 241],
 [237, 241, 242],
 [238, 244, 244],
 ...,
 [ 29,  51,  64],
 [ 29,  51,  64],
 [ 29,  51,  64]],

[[246, 247, 249],
 [243, 247, 248],
 [239, 247, 249],
 ...,
 [ 29,  51,  64],
 [ 29,  51,  64],
 [ 29,  51,  64]]], dtype=uint8)
```

```
[54] type(ai_arr)
```

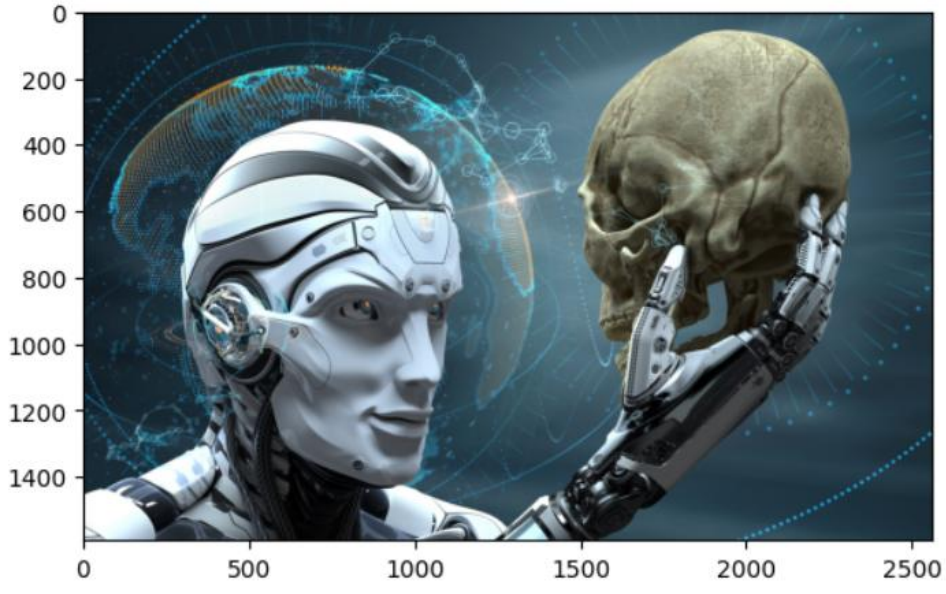
```
numpy.ndarray
```

```
[55] ai_arr.shape
```

```
(1592, 2560, 3)
```

```
[56] plt.imshow(ai_arr)
```

```
<matplotlib.image.AxesImage at 0x7ddadf3c6810>
```



```
[58] red = ai_arr.copy()
     red
```

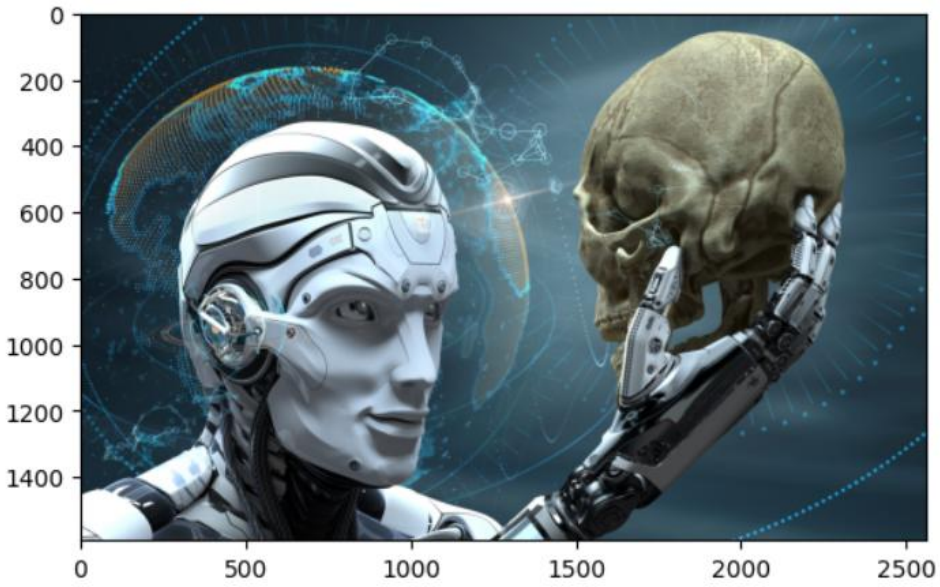
```
array([[[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 44,  76,  91],
        [ 44,  76,  91],
        [ 44,  76,  91]],

       [[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 45,  77,  92],
        [ 45,  77,  92],
        [ 45,  77,  92]],

       [[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 45,  77,  92],
        [ 45,  77,  92],
        [ 45,  77,  92]],

       ...,

       [[246, 248, 247],
```

```
[59] red == ai_arr
```

```
array([[[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       ...,

       [[ True,  True,  True],
        [ True,  True,  True],
```

```
[60] plt.imshow(red)
```

```
<matplotlib.image.AxesImage at 0x7ddadf8b1490>
```

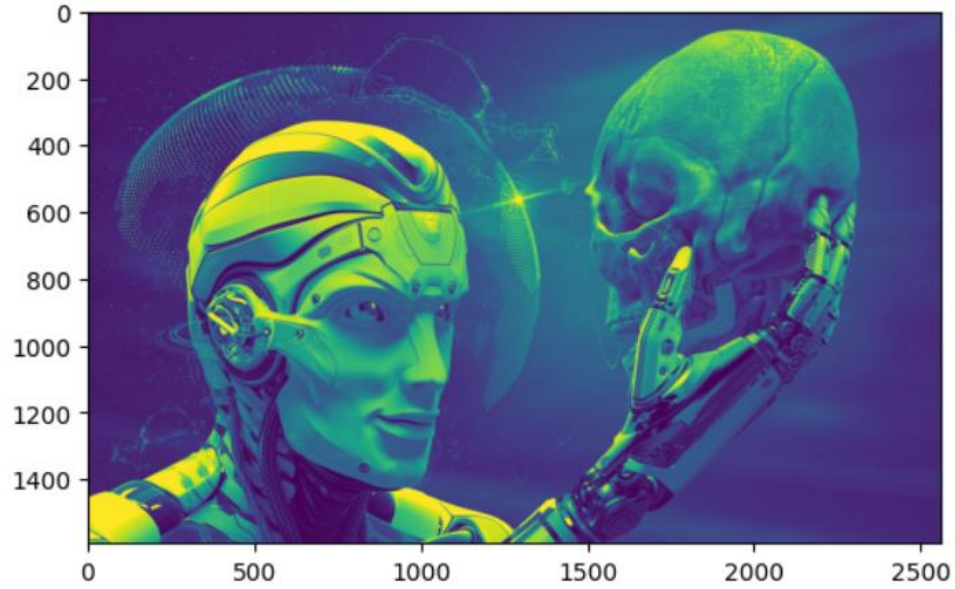



```
[61] red.shape
```

```
(1592, 2560, 3)
```

```
plt.imshow(red[:,:,0])
```

```
<matplotlib.image.AxesImage at 0x7ddae0997d10>
```



```
[63] red[:,:,0]
```

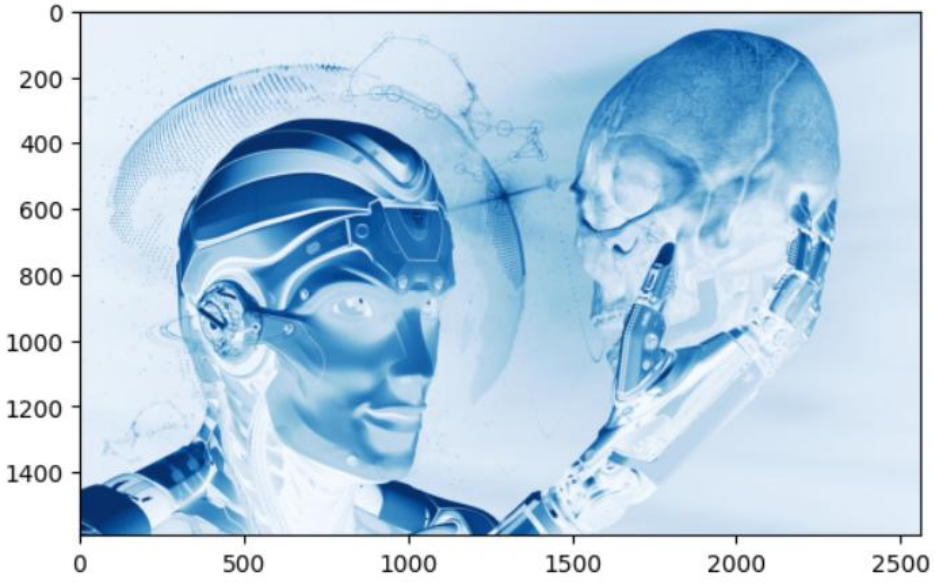
```
array([[ 17,  17,  17, ...,  44,  44,  44],
       [ 17,  17,  17, ...,  45,  45,  45],
       [ 17,  17,  17, ...,  45,  45,  45],
       ...,
       [246, 244, 244, ...,  29,  29,  29],
       [238, 237, 238, ...,  29,  29,  29],
       [246, 243, 239, ...,  29,  29,  29]], dtype=uint8)
```

```
[64] plt.imshow(red[:,:,0], cmap = 'grey')
```

```
<matplotlib.image.AxesImage at 0x7ddade02ae90>
```

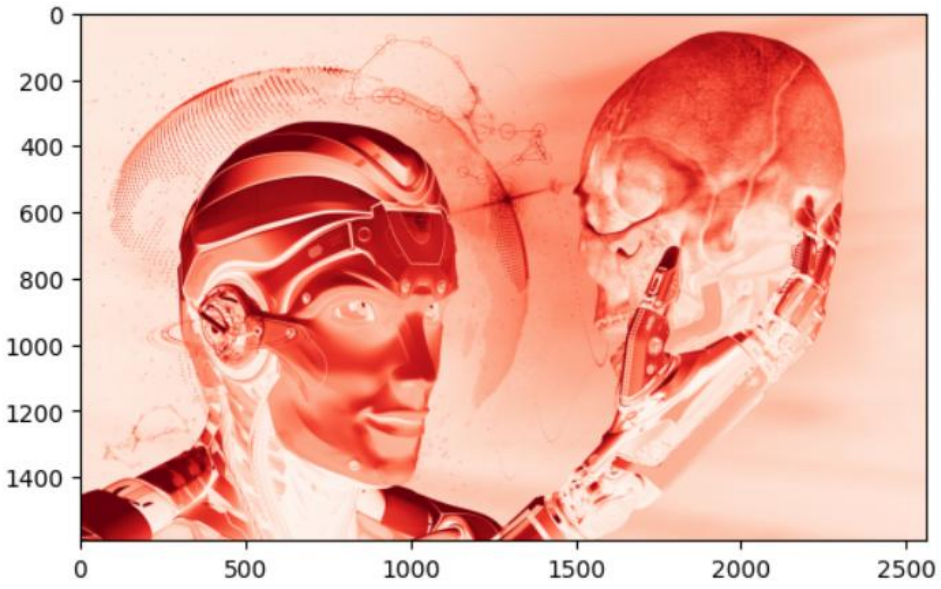

```
[66] plt.imshow(red[:,:,0], cmap = 'Blues')
```

```
<matplotlib.image.AxesImage at 0x7ddaddb86110>
```



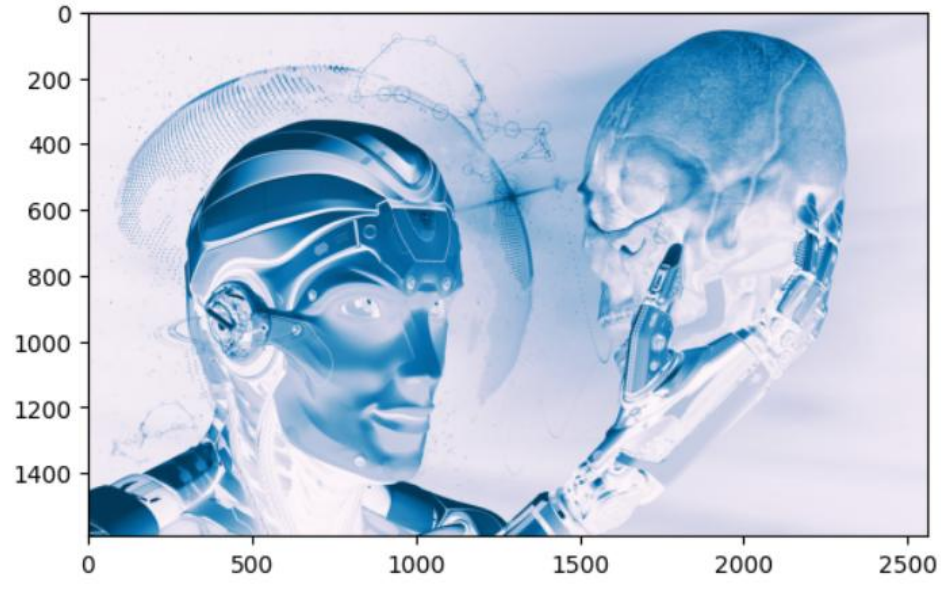
```
[67] plt.imshow(red[:,:,0], cmap = 'Reds')
```

```
<matplotlib.image.AxesImage at 0x7ddaddb2ae90>
```



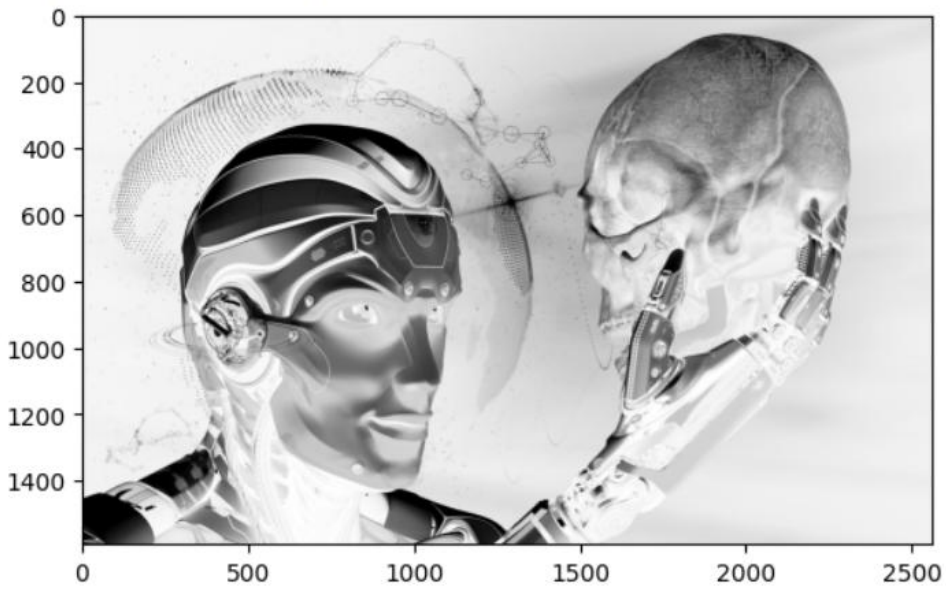

```
[68] plt.imshow(red[:,:,0], cmap = 'PuBu')
```

```
<matplotlib.image.AxesImage at 0x7ddaddbf1850>
```



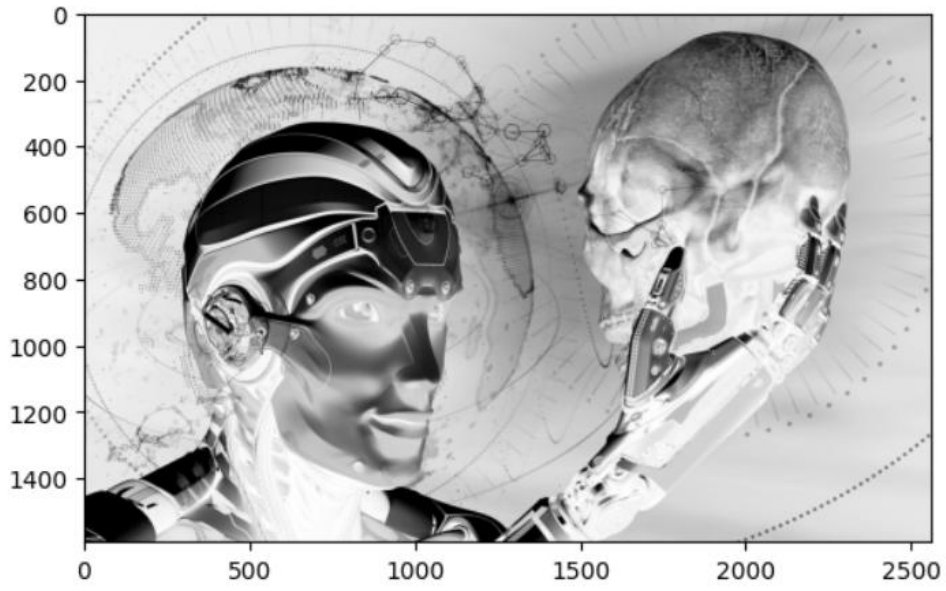
```
[69] plt.imshow(red[:,:,0], cmap = 'Greys')
```

```
<matplotlib.image.AxesImage at 0x7ddadf2cfd10>
```



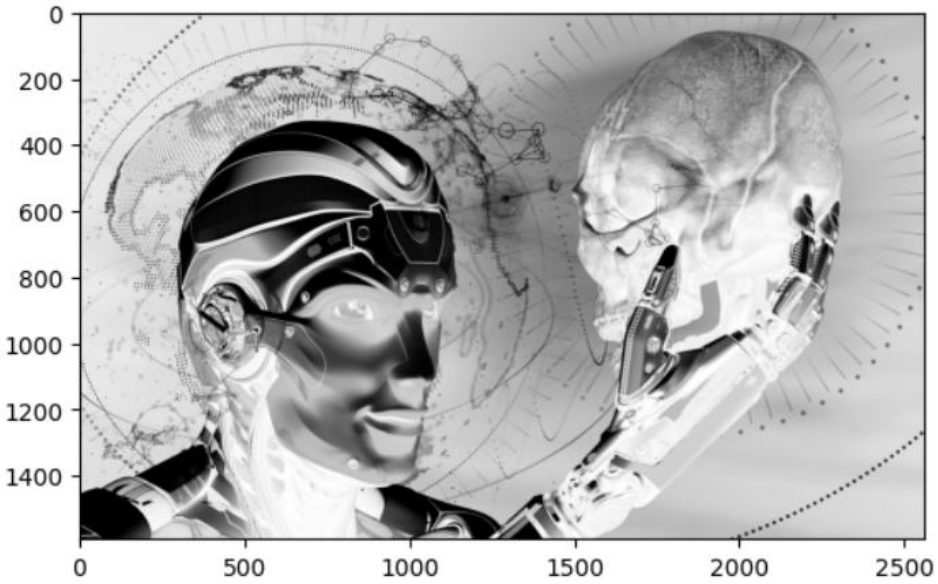

```
[70] plt.imshow(red[:,:,1], cmap = 'Greys')
```

```
<matplotlib.image.AxesImage at 0x7ddade20d1d0>
```



```
[72] plt.imshow(red[:,:,2], cmap = 'Greys')
```

```
<matplotlib.image.AxesImage at 0x7ddaddad32d0>
```




```
[73] red[:,:,0]
```

```
array([[ 17,  17,  17, ...,  44,  44,  44],
       [ 17,  17,  17, ...,  45,  45,  45],
       [ 17,  17,  17, ...,  45,  45,  45],
       ...,
       [246, 244, 244, ...,  29,  29,  29],
       [238, 237, 238, ...,  29,  29,  29],
       [246, 243, 239, ...,  29,  29,  29]], dtype=uint8)
```

```
[74] red[:,:,1]
```

```
array([[ 30,  30,  30, ...,  76,  76,  76],
       [ 30,  30,  30, ...,  77,  77,  77],
       [ 30,  30,  30, ...,  77,  77,  77],
       ...,
       [248, 248, 248, ...,  51,  51,  51],
       [239, 241, 244, ...,  51,  51,  51],
       [247, 247, 247, ...,  51,  51,  51]], dtype=uint8)
```

```
[75] red[:,:,2]
```

```
array([[ 39,  39,  39, ...,  91,  91,  91],
       [ 39,  39,  39, ...,  92,  92,  92],
       [ 39,  39,  39, ...,  92,  92,  92],
       ...,
       [247, 247, 249, ...,  64,  64,  64],
       [241, 242, 244, ...,  64,  64,  64],
       [249, 248, 249, ...,  64,  64,  64]], dtype=uint8)
```

```
[76] red[:,:,1] = 0
```

```
[77] red[:,:,1]
```

```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

```
plt.imshow(red)
```

```
<matplotlib.image.AxesImage at 0x7ddadc79ed50>
```

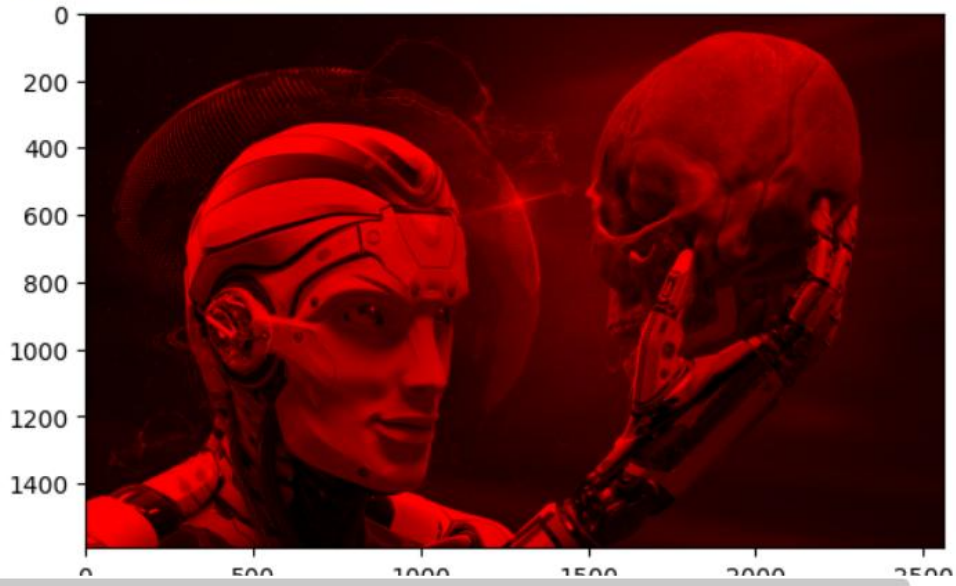

```
[79] red[:,:,2] = 0
```

```
[80] red[:,:,2]
```

```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

```
[81] plt.imshow(red)
```

```
<matplotlib.image.AxesImage at 0x7ddadd95b7d0>
```




```
[82] plt.imshow(AI)
```

```
<matplotlib.image.AxesImage at 0x7ddadc517d10>
```

```
[84] arr1 = np.asarray(AI)
     arr1
```

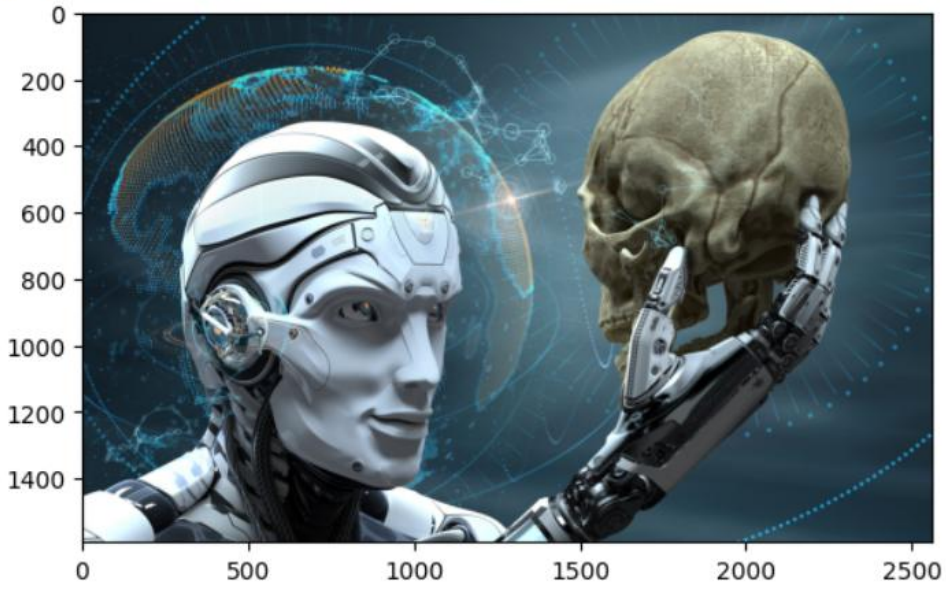
```
array([[[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 44,  76,  91],
        [ 44,  76,  91],
        [ 44,  76,  91]],

       [[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 45,  77,  92],
        [ 45,  77,  92],
        [ 45,  77,  92]],

       [[ 17,  30,  39],
        [ 17,  30,  39],
        [ 17,  30,  39],
        ...,
        [ 45,  77,  92],
        [ 45,  77,  92],
        [ 45,  77,  92]],

       ...,

       [[246, 248, 247],
        [244, 248, 247],
```

```
[85] arr1.shape
```

```
(1592, 2560, 3)
```

```
[86] plt.imshow(AI)
```

```
<matplotlib.image.AxesImage at 0x7ddadc7f6850>
```

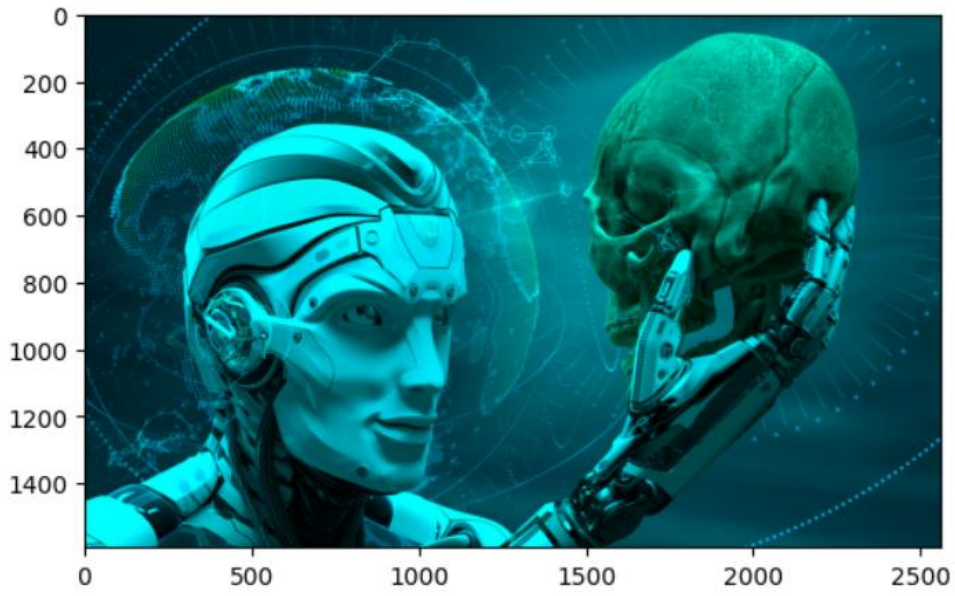


```
[87] AI1 = arr1.copy()
```

```
[88] AI1[:,:,0] = 0
```

```
[89] plt.imshow(AI1)
```

```
<matplotlib.image.AxesImage at 0x7ddadc3ae4d0>
```




```
[90] AI1[:,:,1] = 0
```

```
[91] plt.imshow(AI1)
```

```
<matplotlib.image.AxesImage at 0x7ddadc33b3d0>
```