

Color Threshold Blue Screen

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

%matplotlib inline
```

Read in and display the image

```
In [5]: # Read in the image
image = cv2.imread('D:/Udacity/Jupyter/pizza_bluescreen.jpg')

# Print out the type of image data and its dimensions (height, width, and color)
print('This image is:', type(image),
      ' with dimensions:', image.shape)
```

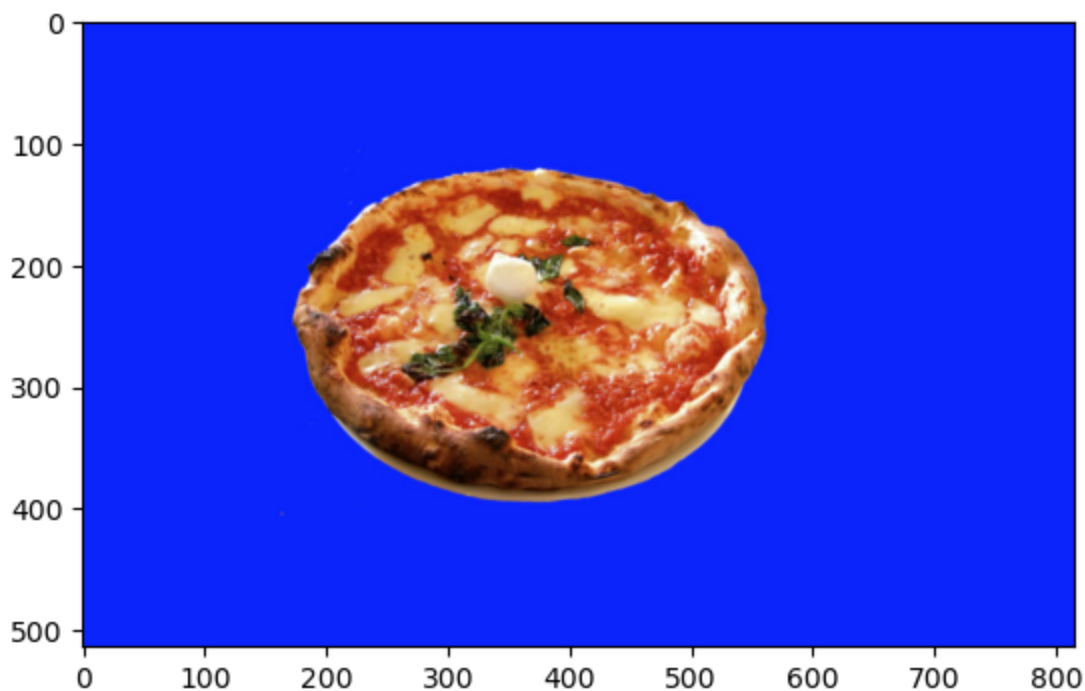
This image is: <class 'numpy.ndarray'> with dimensions: (514, 816, 3)

```
In [6]: # Make a copy of the image
image_copy = np.copy(image)

# Change color to RGB (from BGR)
image_copy = cv2.cvtColor(image_copy, cv2.COLOR_BGR2RGB)

# Display the image copy
plt.imshow(image_copy)
```

Out[6]: <matplotlib.image.AxesImage at 0x2258cce7550>



```
In [7]: # Define the color threshold
lower_blue = np.array([0,0,200])
upper_blue = np.array([250,250,255])
```

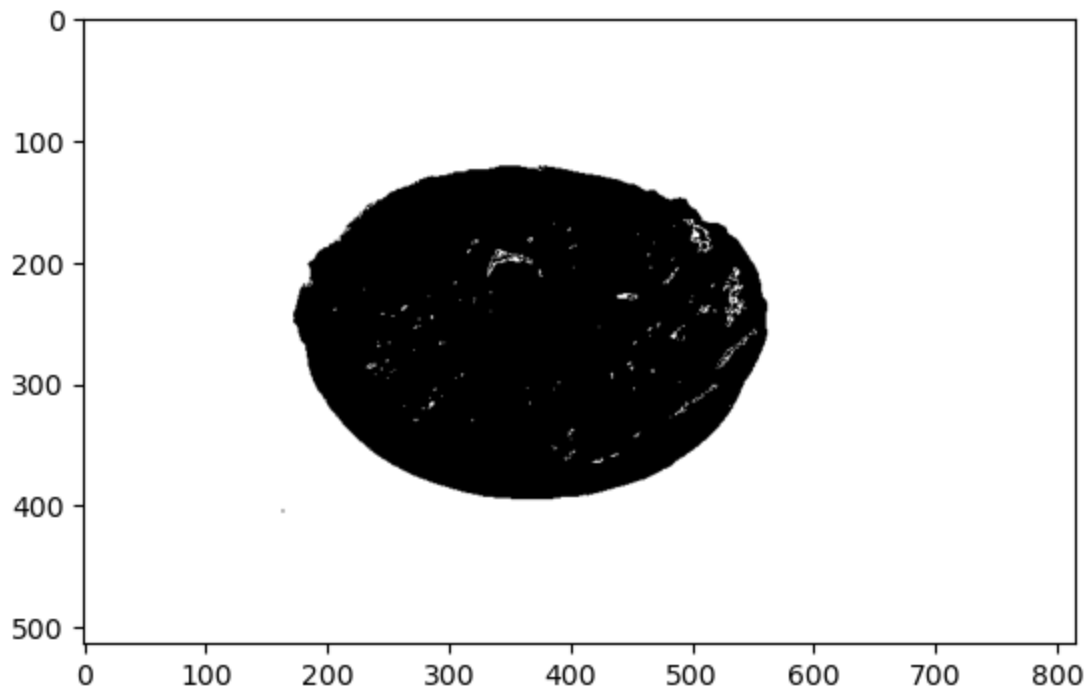
Creating a Mask

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In [8]: # Define the masked area
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mask = cv2.inRange(image_copy, lower_blue, upper_blue)
```

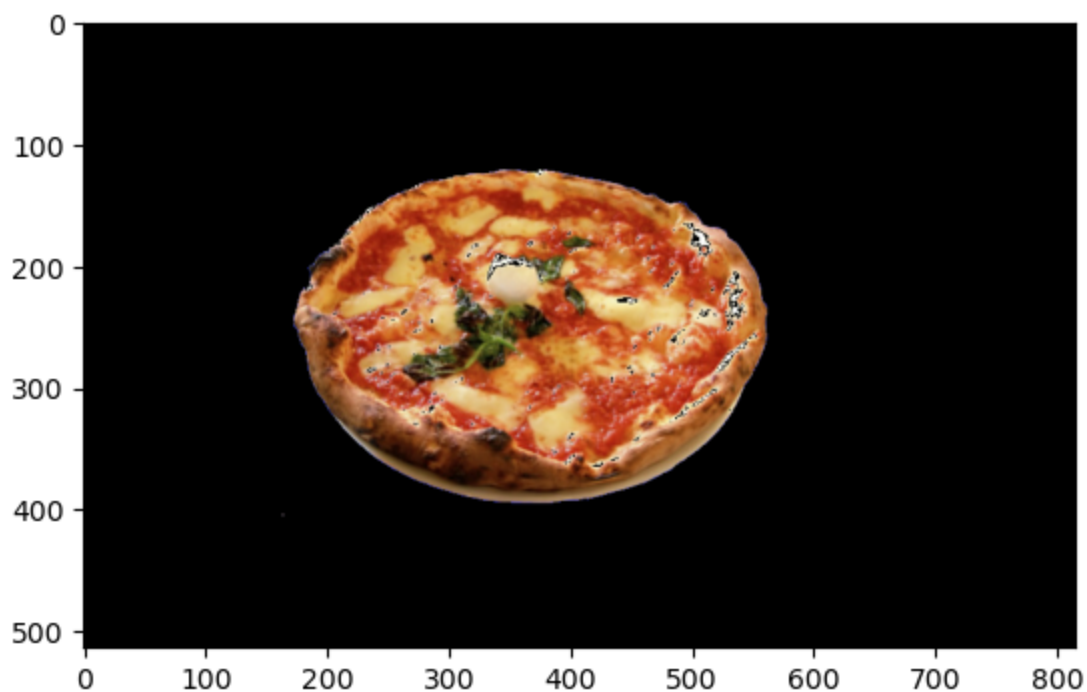
```
# Vizualize the mask  
plt.imshow(mask, cmap='gray')
```

Out[8]: <matplotlib.image.AxesImage at 0x2258d537550>



```
In [9]: # Mask the image to let the pizza show through  
masked_image = np.copy(image_copy)  
  
masked_image[mask != 0] = [0, 0, 0]  
  
# Display it!  
plt.imshow(masked_image)
```

Out[9]: <matplotlib.image.AxesImage at 0x2258d609a50>

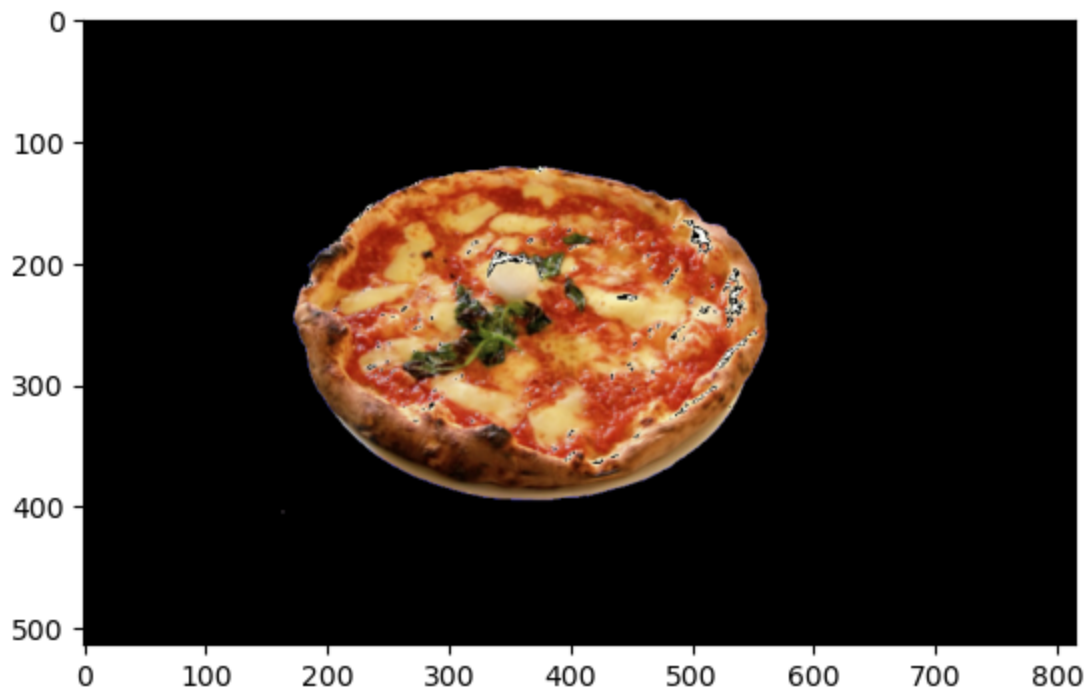


```
In [10]: # Mask the image to let the pizza show through  
masked_image = np.copy(image_copy)
```

```
masked_image[mask != 0] = [0, 0, 0]
```

```
# Display it!  
plt.imshow(masked_image)
```

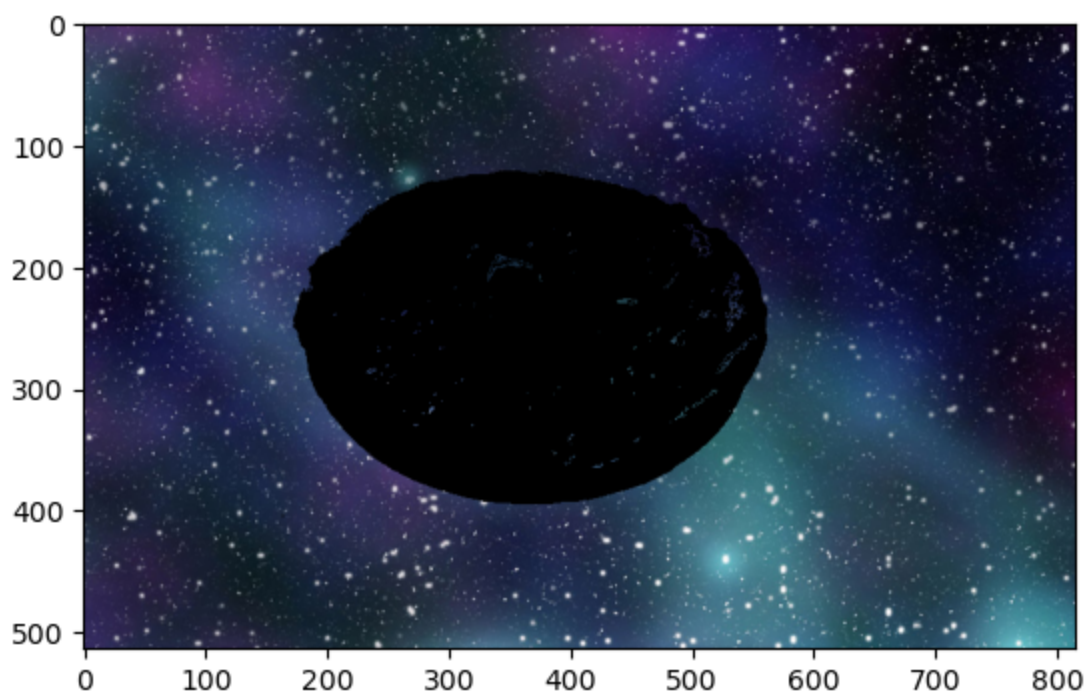
Out[10]: <matplotlib.image.AxesImage at 0x2258d686510>



Mask and add a background image

```
In [13]: # Load in a background image, and convert it to RGB  
background_image = cv2.imread('D:/Udacity/Jupyter/space_background.jpg')  
background_image = cv2.cvtColor(background_image, cv2.COLOR_BGR2RGB)  
  
# Crop it to the right size (514x816)  
crop_background = background_image[0:514, 0:816]  
  
# Mask the cropped background so that the pizza area is blocked  
crop_background[mask == 0] = [0, 0, 0]  
  
# Display the background  
plt.imshow(crop_background)
```

Out[13]: <matplotlib.image.AxesImage at 0x2258e6b29d0>

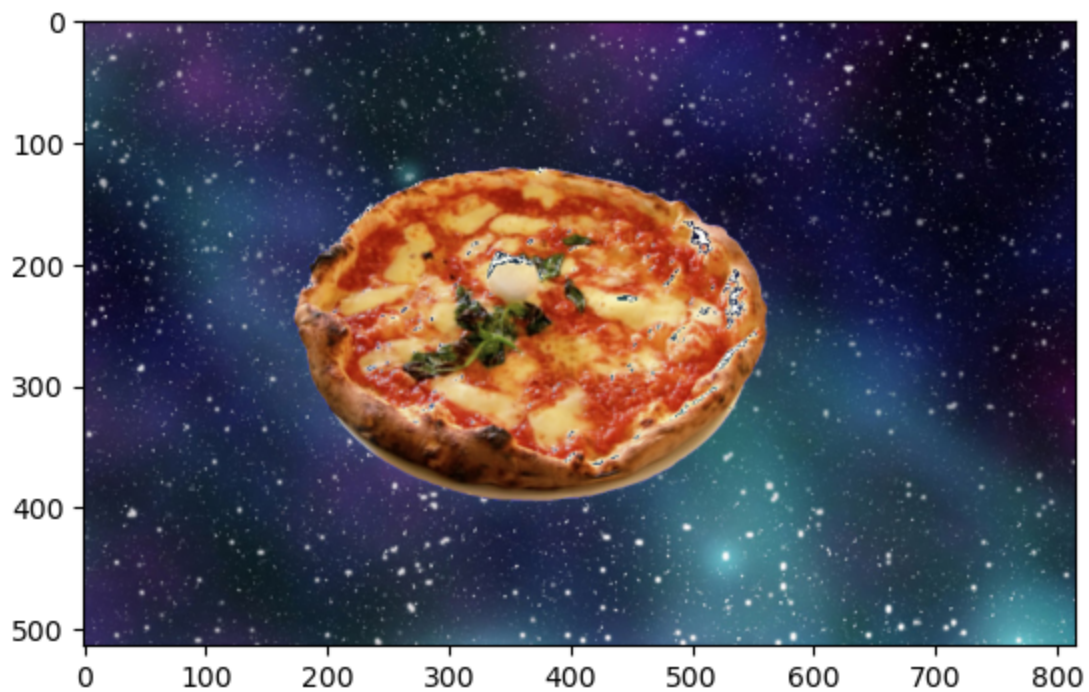


Create a complete image

```
In [14]: # Add the two images together to create a complete image!
complete_image = masked_image + crop_background

# Display the result
plt.imshow(complete_image)
```

```
Out[14]: <matplotlib.image.AxesImage at 0x2258e6f6510>
```



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In [ ]:
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