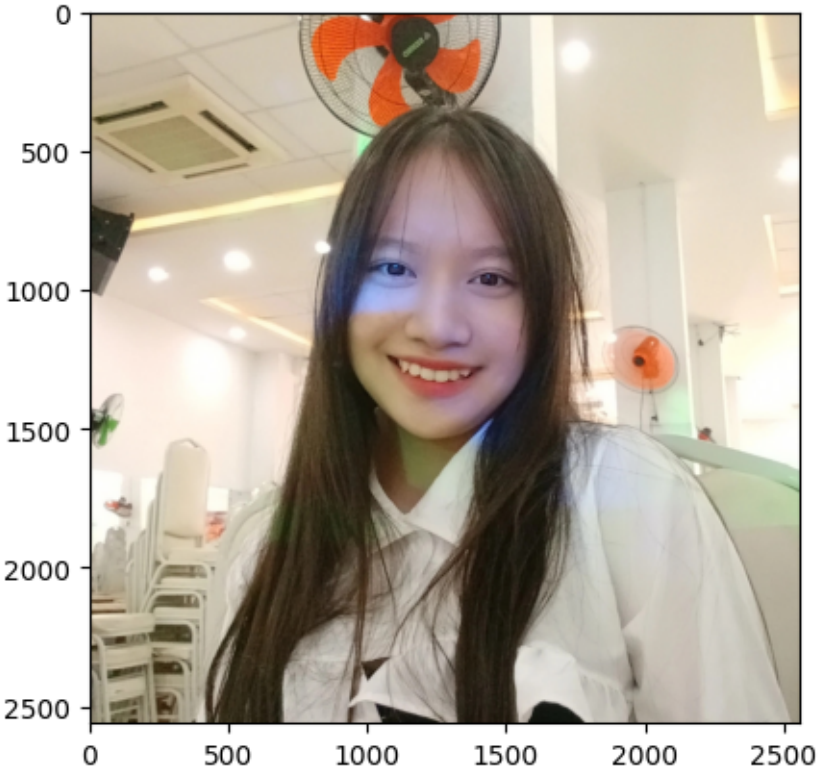
h195160o-m225187171ng-b225186161n

August 20, 2024

[9]:
```
import cv2
import numpy as np
import matplotlib.pyplot as plt
```

[11]:
```
#read image
img = cv2.imread('/content/z5701553242308_6dd8bb98e0adfb8b2c46e6a67a075238.jpg')
#hien thi anh
#plt.imshow(img)
plt.imshow(img[:,:,::-1])
```

[11]:
```
<matplotlib.image.AxesImage at 0x7b3b9427b9a0>
```



[12]:
```
from google.colab import drive
drive.mount('/content/drive')
```

```
Drive already mounted at /content/drive; to attempt to forcibly remount, call
drive.mount("/content/drive", force_remount=True).
```

[13]:
```
iname = "/content/z5701553242308_6dd8bb98e0adfb8b2c46e6a67a075238.jpg"

# read image
image = cv2.imread(iname)

# each image is a matrix of size HxWx3
image
```

[13]:
```
array([[[165, 182, 195],
        [171, 188, 201],
        [176, 193, 206],
        …,
        [180, 204, 216],
        [180, 204, 216],
        [180, 204, 216]],

       [[164, 181, 194],
        [170, 187, 200],
        [175, 192, 205],
        …,
        [180, 204, 216],
        [180, 204, 216],
        [180, 204, 216]],

       [[163, 180, 193],
        [170, 187, 200],
        [175, 192, 205],
        …,
        [180, 204, 216],
        [180, 204, 216],
        [180, 204, 216]],

       …,

       [[103, 122, 130],
        [109, 128, 136],
        [115, 134, 142],
        …,
        [130, 149, 157],
        [127, 148, 156],
        [126, 147, 155]],
```

```
        [[102, 121, 129],
         [108, 127, 135],
         [113, 132, 140],
         …,
         [130, 149, 157],
         [127, 148, 156],
         [126, 147, 155]],

        [[100, 119, 127],
         [105, 124, 132],
         [111, 130, 138],
         …,
         [130, 149, 157],
         [127, 148, 156],
         [126, 147, 155]]], dtype=uint8)
```

[14]:
```
# Kich thuoc anh
image.shape
```

[14]:
```
(2560, 2560, 3)
```

[15]:
```
h,w,c = img.shape
print(h,w,c)
```

```
2560 2560 3
```

[16]:
```
image.size
```

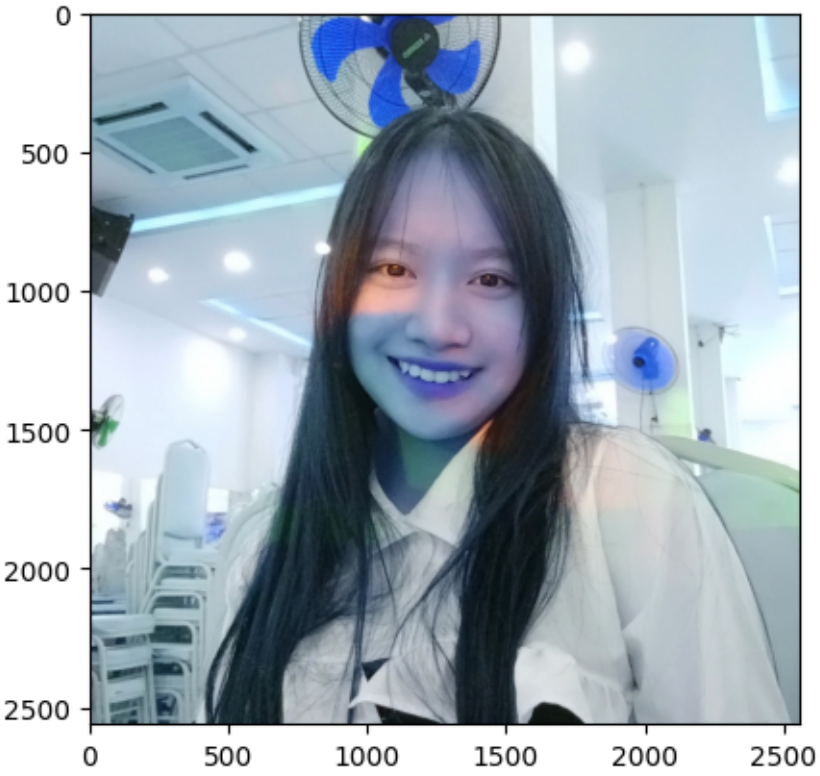
[16]:
```
19660800
```

[17]:
```
image.dtype
```

[17]:
```
dtype('uint8')
```

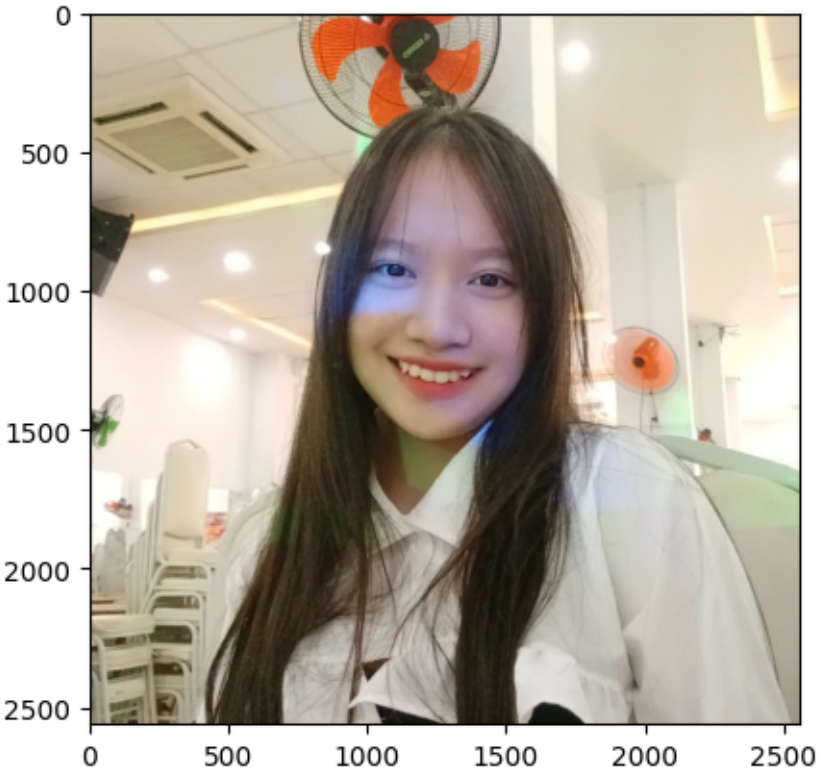
[18]:
```
# Chuyen sang BGR
plt.imshow(image)
```

[18]:
```
<matplotlib.image.AxesImage at 0x7b3b904a9960>
```



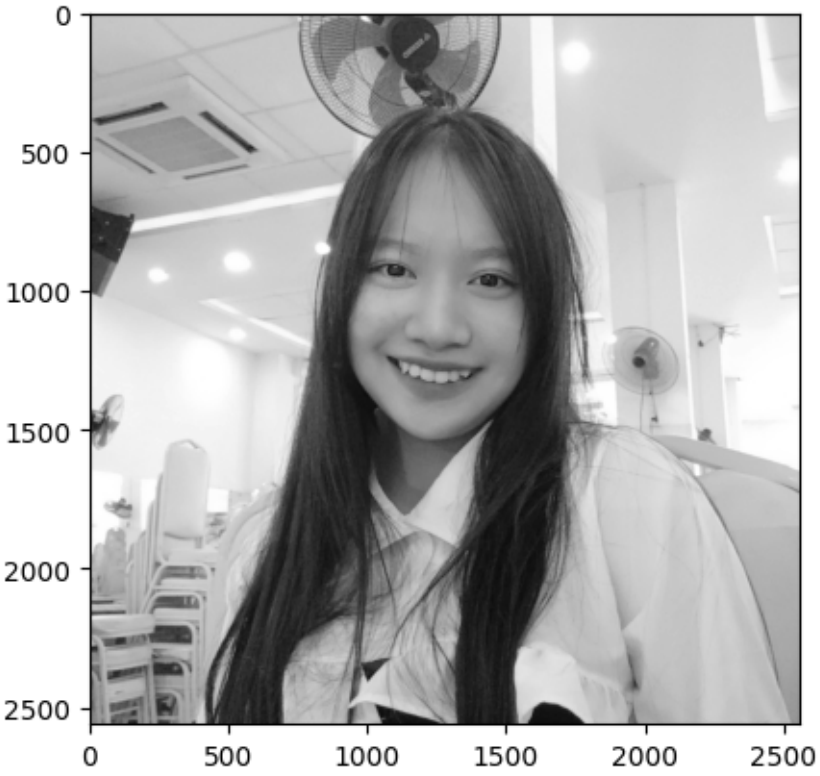
[19]:
```
# Hien thi anh dang RGB
plt.imshow(image[:,:,::-1])
```

[19]: <matplotlib.image.AxesImage at 0x7b3b9057a2f0>

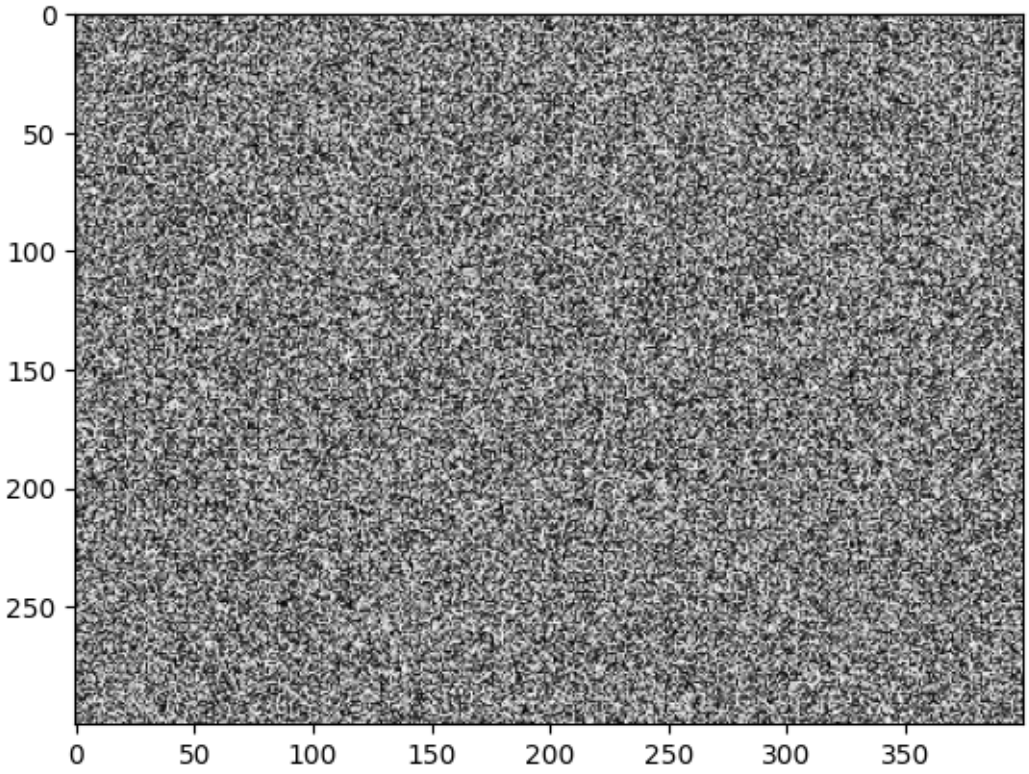


[20]:
```
# Chuyen anh sang mau xam
img = cv2.imread(iname, 0)
plt.imshow(img, cmap="gray")
```

[20]: <matplotlib.image.AxesImage at 0x7b3bd3a0fdc0>



[21]:
```
# Tao anh ngau nhien
array = np.random.randint(0, 256, 120000)
grayImage = array.reshape(300, 400)
plt.imshow(grayImage, cmap='gray')
colorImage = array.reshape(100, 400, 3)
```



[22]:
```
image[0,0]
```

[22]:
```
array([165, 182, 195], dtype=uint8)
```

[23]:
```
image[0:10, 10:20]
```

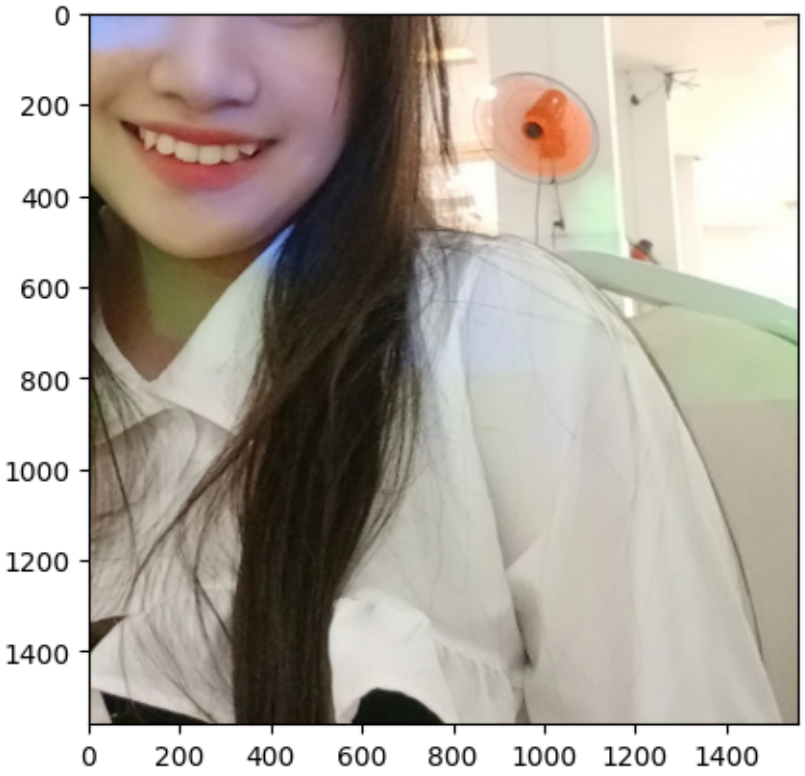
[23]:
```
array([[[179, 196, 209],
        [180, 197, 210],
        [180, 197, 210],
        [180, 197, 210],
        [181, 198, 211],
        [181, 198, 211],
        [177, 194, 207],
        [178, 195, 208],
        [179, 196, 209],
        [179, 196, 209]],

       [[179, 196, 209],
        [179, 196, 209],
        [179, 196, 209],
        [179, 196, 209],
        [179, 196, 209],
```

```
 [179, 196, 209],
 [178, 195, 208],
 [178, 195, 208],
 [179, 196, 209],
 [180, 197, 210]],

[[179, 196, 209],
 [179, 196, 209],
 [178, 195, 208],
 [177, 194, 207],
 [177, 194, 207],
 [177, 194, 207],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209]],

[[178, 195, 208],
 [178, 195, 208],
 [177, 194, 207],
 [176, 193, 206],
 [176, 193, 206],
 [176, 193, 206],
 [178, 195, 208],
 [178, 195, 208],
 [178, 195, 208],
 [178, 195, 208]],

[[178, 195, 208],
 [177, 194, 207],
 [176, 193, 206],
 [176, 193, 206],
 [176, 193, 206],
 [177, 194, 207],
 [177, 194, 207],
 [177, 194, 207],
 [177, 194, 207],
 [178, 195, 208]],

[[178, 195, 208],
 [177, 194, 207],
 [177, 194, 207],
 [176, 193, 206],
 [177, 194, 207],
 [178, 195, 208],
 [177, 194, 207],
 [177, 194, 207],
```

```
 [177, 194, 207],
 [178, 195, 208]],

[[179, 196, 209],
 [178, 195, 208],
 [177, 194, 207],
 [177, 194, 207],
 [178, 195, 208],
 [178, 195, 208],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209]],

[[180, 197, 210],
 [178, 195, 208],
 [177, 194, 207],
 [177, 194, 207],
 [178, 195, 208],
 [179, 196, 209],
 [181, 198, 211],
 [181, 198, 211],
 [180, 197, 210],
 [180, 197, 210]],

[[179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [178, 195, 208],
 [179, 196, 209],
 [180, 197, 210],
 [180, 197, 210]],

[[179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [179, 196, 209],
 [178, 195, 208],
 [177, 194, 207],
 [178, 195, 208],
 [179, 196, 209],
 [180, 197, 210]]], dtype=uint8)
```

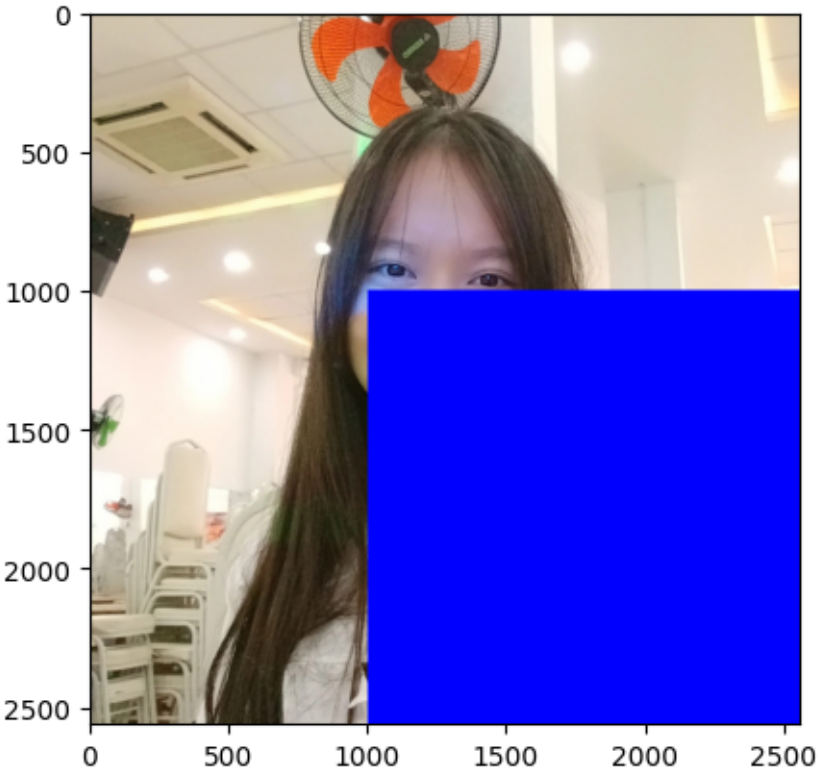
[30]:
```
# Crop image
crop = image[1000:3000, 1000:3000]
plt.imshow(crop[:,:,::-1])
```

[30]: <matplotlib.image.AxesImage at 0x7b3b8af80820>



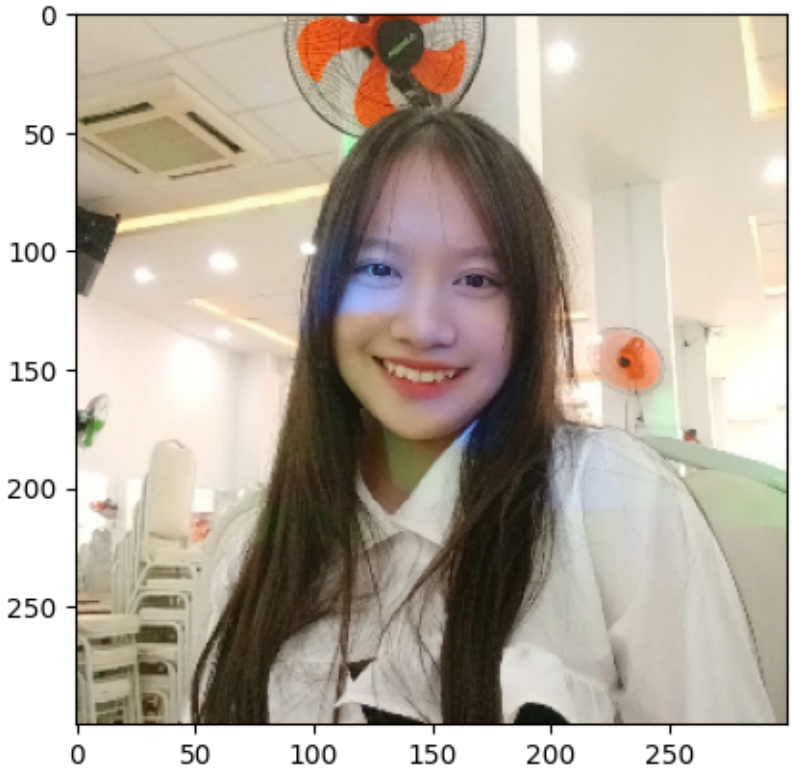
[31]:
```
# Doi mau mot vung anh
copy = image.copy()
copy[1000:3000, 1000:3000] = [255, 0, 0]
plt.imshow(copy[:,:,::-1])
```

[31]: <matplotlib.image.AxesImage at 0x7b3b8afa2950>



[32]:
```
# Thay doi kich thuoc anh
h, w = image.shape[:2]
resized = cv2.resize(image, (300, 300))
plt.imshow(resized[:,:,::-1])
```

[32]: <matplotlib.image.AxesImage at 0x7b3b8af810f0>

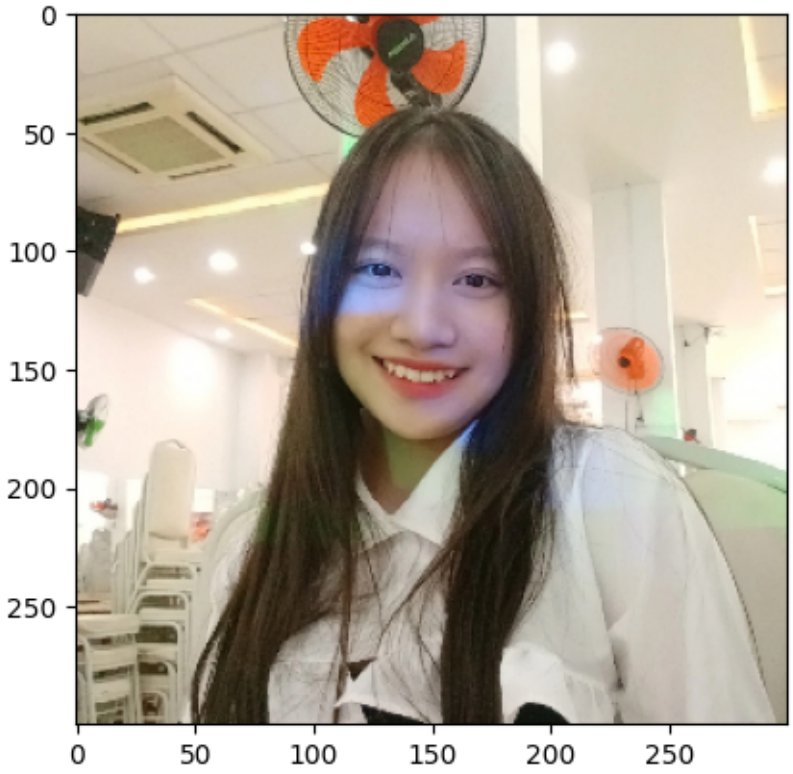


[34]:
```
# Thay doi kich thuoc nhung van giuw ti le khung
new_w = 300
aspect_ratio = h/w
new_h = int(new_w*aspect_ratio)
print(new_h)
```

```
300
```

[36]:
```
resized = cv2.resize(image, (new_w, new_h))
plt.imshow(resized[:,:,::-1])
```

[36]: <matplotlib.image.AxesImage at 0x7b3b8ad365c0>

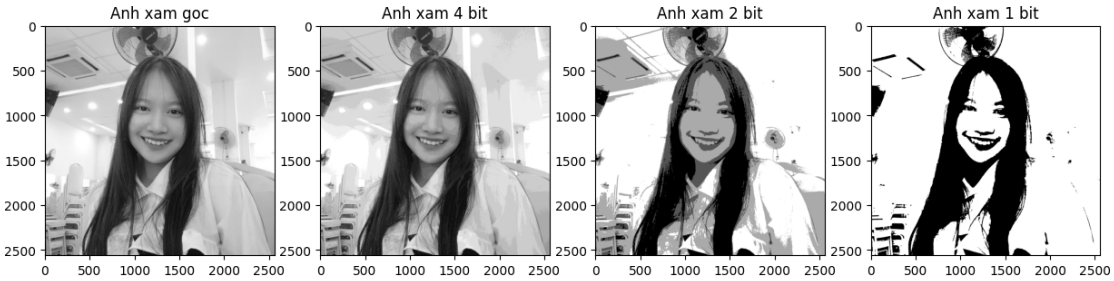


[40]:
```
# Write image
cv2.imwrite("/content/z5701553242308_6dd8bb98e0adfb8b2c46e6a67a075238.jpg",␣
 ↪resized)
```

[40]: True

[41]:
```
img_xam_4bit = (img // 16)
img_xam_2bit = (img // 64)
img_xam_1bit = (img // 128)

plt. figure(figsize=(15, 5))
plt. subplot(1, 4, 1)
plt. imshow(img, cmap='gray')
plt. title('Anh xam goc' )
plt. subplot(1, 4, 2)
plt. imshow(img_xam_4bit, cmap='gray')
plt.title( 'Anh xam 4 bit')
plt. subplot(1, 4, 3)
plt. imshow(img_xam_2bit, cmap='gray')
plt.title('Anh xam 2 bit')
plt. subplot(1, 4, 4)
plt. imshow(img_xam_1bit, cmap='gray')
```

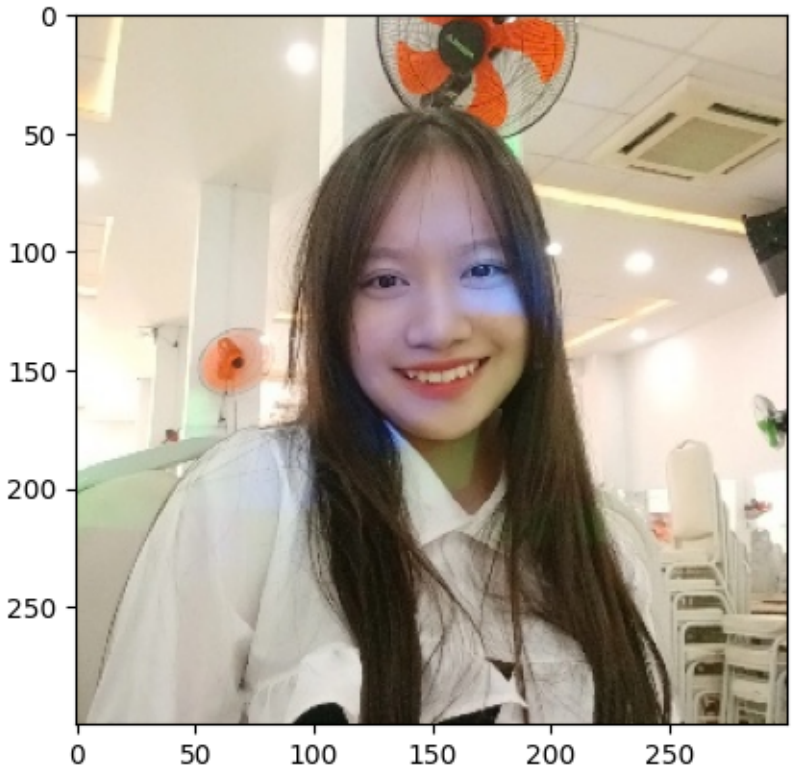
```
plt. title('Anh xam 1 bit')
plt. show()
```



[44]:
```
img = cv2.imread('/content/z5701553242308_6dd8bb98e0adfb8b2c46e6a67a075238.jpg')
```

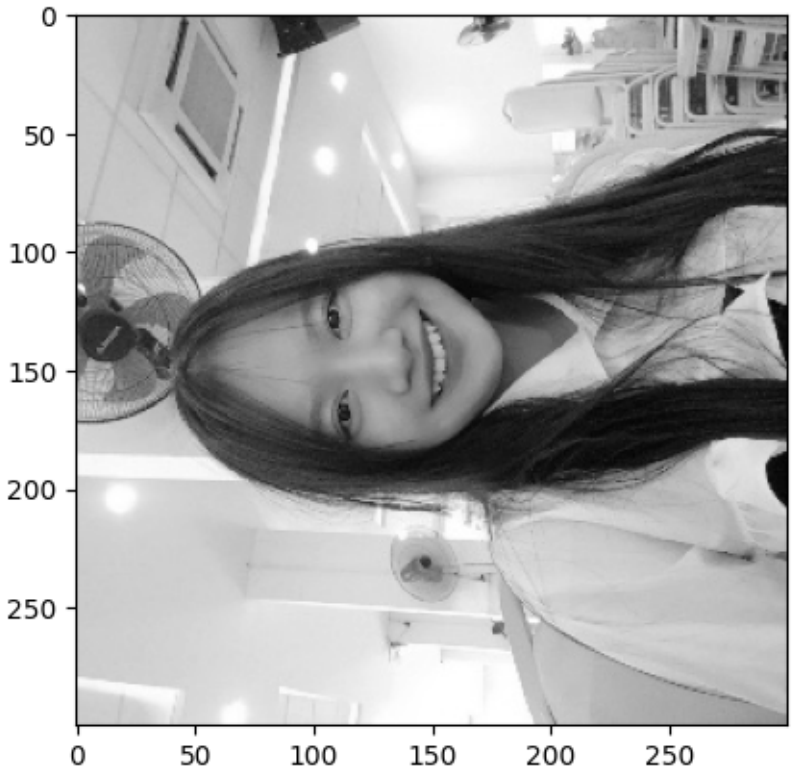
[45]:
```
# Flip anh
result = img[:,::-1]
plt.imshow(result[:,:,::-1])
```

[45]: <matplotlib.image.AxesImage at 0x7b3b8ab852a0>



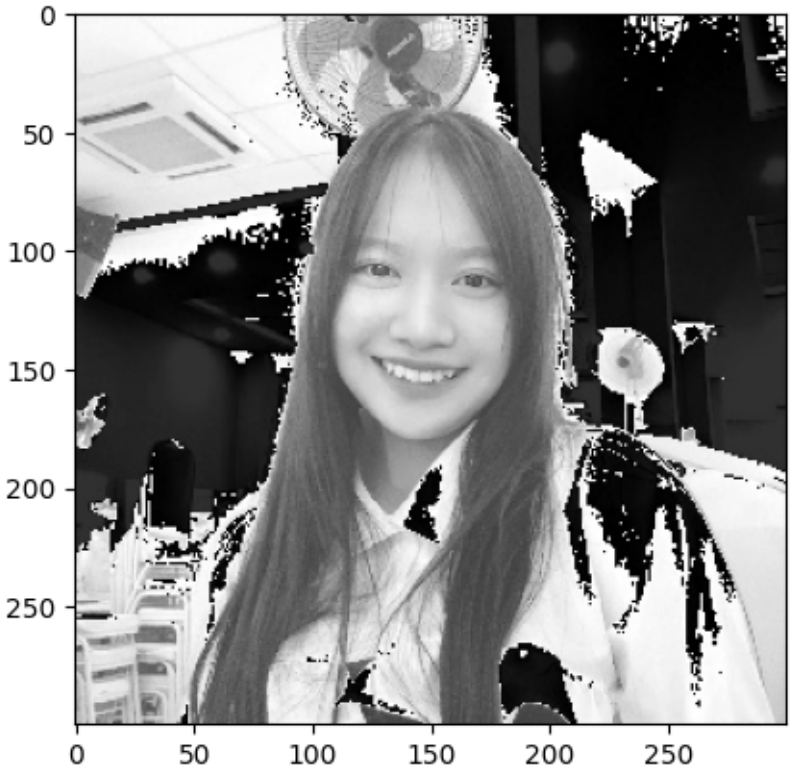
[52]:
```
# Xoay anh
gr = cv2.imread('/content/z5701553242308_6dd8bb98e0adfb8b2c46e6a67a075238.jpg',␣
↪0)
result = gr.transpose()
plt.imshow(result,cmap='gray')
```

[52]: <matplotlib.image.AxesImage at 0x7b3b8a93aec0>



[53]:
```
# Dieu chinh do sang toi cua anh
result = img.copy()
result = result + 50
plt.imshow(result, cmap='gray')
```

[53]: <matplotlib.image.AxesImage at 0x7b3b8a939390>


0
50
100
150
200
250
0
50
100
150
200
250