Image scaling

In OpenCV, the function for image scaling is: cv2.resize(InputArray src, OutputArray dst, Size, fx, fy, interpolation)

Code path:

```
~/jetcobot_ws/src/jetcobot_opencv/opencv_basic/02_OpenCV Transform/01 pixel
operation.ipynb
```

Parameter explanation:

InputArray src	Input image
OutputArray dst	Output image
Size	Output image size
fx, fy	Scaling coefficients along the x-axis and y-axis
interpolation	Interpolation method

Option interpolation method used:

INTER_NEAREST	Nearest neighbor interpolation
INTER_LINEAR	Bilinear interpolation (default setting)
INTER_AREA	Resample using pixel area relations.
INTER_CUBIC	Bicubic interpolation of 4x4 pixel neighborhood
INTER_LANCZOS4	Lanczos interpolation of 8x8 pixel neighborhood

Note:

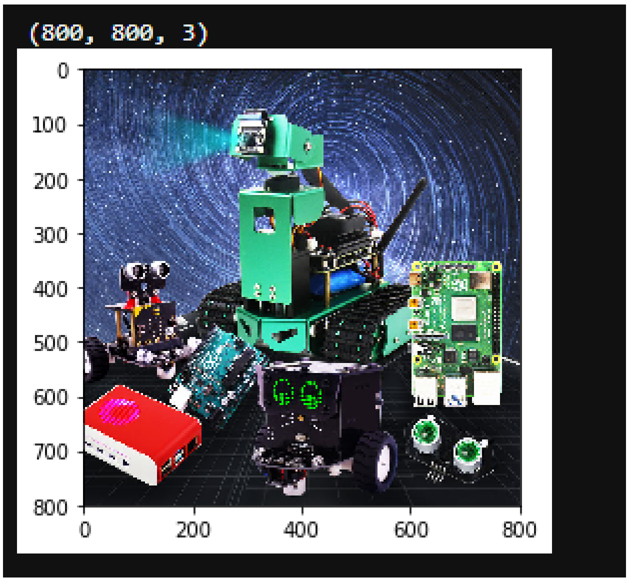
1. The output size format is (width, height)
2. The default interpolation method is: bilinear interpolation

The main code is as follows:

```
# 1 load 2 info 3 resize 4 check
import cv2
import matplotlib.pyplot as plt # Python 2D drawing library

# Read the original image
img = cv2.imread('yahboom.jpg')
# Print the image size
print(img.shape)
# Assign the image height and width to x, y respectively
x, y = img.shape[0:2]

# Scale to half of the original size, the output size format is (width, height)
img_test1 = cv2.resize(img, (int(y / 2), int(x / 2)))
```

```
# cv2.imshow('resize0', img_test1)
# cv2.waitKey()

# Nearest neighbor interpolation scaling

# Scale to one-fourth of the original
img_test2 = cv2.resize(img, (0, 0), fx=0.25, fy=0.25,
interpolation=cv2.INTER_NEAREST)
# cv.imshow('resize1', img_test2)
# cv.waitKey()
# cv.destroyAllWindows()
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
dst1 = cv2.cvtColor(img_test1, cv2.COLOR_BGR2RGB)
dst2 = cv2.cvtColor(img_test2, cv2.COLOR_BGR2RGB)
# Display original image
plt.imshow(img)
plt.show()
```

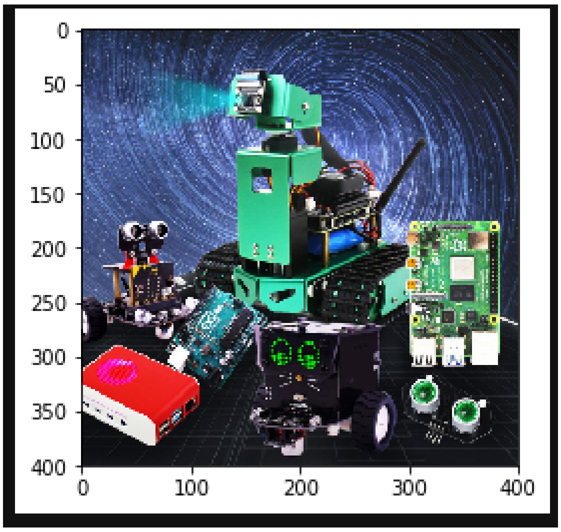
After execution, you can see that the image is 800*800



```
(800, 800, 3)
```

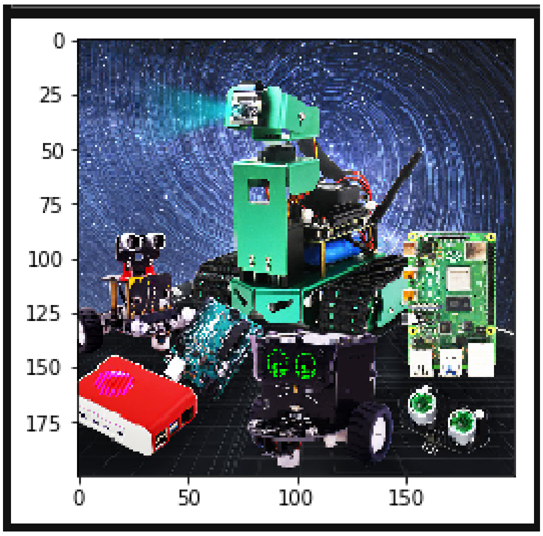
```
# Display zoom 1/2
plt.imshow(dst1)
plt.show()
```

After execution, you can see that the image is 400*400, which is half the size



```
# Display zoom 1/4 Neighbor interpolation method zoom
plt.imshow(dst2)
plt.show()
```

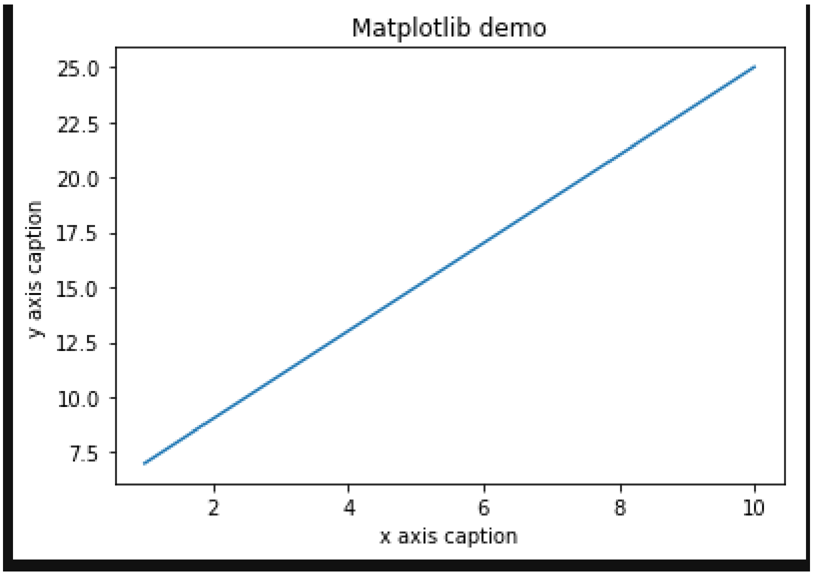
After execution, you can see that the image is 200*200, which is one quarter the size



Next, let's talk about matplotlib: Python's 2D drawing library.

Reference tutorial: https://www.runoob.com/numpy/numpy-matplotlib.html

```
import numpy as np
from matplotlib import pyplot as plt
x = np.arange(1,11)
y = 2 * x + 5
plt.title("Matplotlib demo")
plt.xlabel("x axis caption")
plt.ylabel("y axis caption")
plt.plot(x,y)
plt.show()
```


Matplotlib demo
y axis caption
x axis caption