# Background Segmentation

## 1. Purpose of the experiment

The robot dog processes the detected objects, separates the background and only displays the objects.

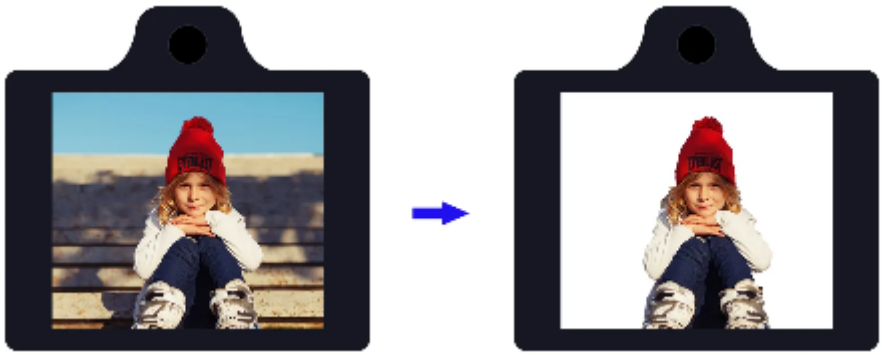
## 2. Experimental path source code

Enter the robot dog system, end the robot dog program, enter "ip (ip is the robot dog's ip): 8888" in the browser, enter the password "yahboom"  and log in.  Enter the path of **DOGZILLA_Lite_class/5.AI Visual Recognition Course/17. Background segment** and run **segmentation.ipynb** .  Or enter the terminal

```
cd ~/DOGZILLA_Lite_class/5.AI Visual Recognition Course/17.  Background segment
python3 segmentation.py
```

## 3. Experimental Phenomenon

After running the source code, you can see that the robot dog separates the detected person from the background.



## 4. Main source code analysis

```
BG_COLOR = (192, 192, 192) # gray
cap=cv2.VideoCapture(0)
cap.set(3,320)
cap.set(4,240)
with mp_selfie_segmentation.SelfieSegmentation(
    model_selection=1) as selfie_segmentation:
  bg_image = None
  while cap.isOpened():
    success, image = cap.read()
    if not success:
      print("Ignoring empty camera frame.")
      # If loading a video, use 'break' instead of 'continue'.
      continue

    # Flip the image horizontally for a later selfie-view display, and convert
    # the BGR image to RGB.
```

```
    image = cv2.cvtColor(cv2.flip(image, 1), cv2.COLOR_BGR2RGB)
    # To improve performance, optionally mark the image as not writeable to
    # pass by reference.
    image.flags.writeable = False
    results = selfie_segmentation.process(image)

    image.flags.writeable = True
    image = cv2.cvtColor(image, cv2.COLOR_RGB2BGR)

    # Draw selfie segmentation on the background image.
    # To improve segmentation around boundaries, consider applying a joint
    # bilateral filter to "results.segmentation_mask" with "image".
    condition = np.stack(
      (results.segmentation_mask,) * 3, axis=-1) > 0.1
    # The background can be customized.
    #   a) Load an image (with the same width and height of the input image) to
    #      be the background, e.g., bg_image = cv2.imread('/path/to/image/file')
    #   b) Blur the input image by applying image filtering, e.g.,
    #      bg_image = cv2.GaussianBlur(image,(55,55),0)
    if bg_image is None:
      bg_image = np.zeros(image.shape, dtype=np.uint8)
      bg_image[:] = BG_COLOR
    output_image = np.where(condition, image, bg_image)
    b,g,r = cv2.split(image)
    image = cv2.merge((r,g,b))
    output_image = np.where(condition, image, bg_image)
    imgok = Image.fromarray(output_image)
    display.ShowImage(imgok)

    r,g,b = cv2.split(output_image)
    imagecv2 = cv2.merge((b,g,r))
    cv2.imshow('img',imagecv2)

    #cv2.imshow('MediaPipe Selfie Segmentation', output_image)
    if cv2.waitKey(5) & 0xFF == 27:
      break
    if button.press_b():
      break

cap.release()
```