

Video_A_Count

รูปโปรแกรม Jupyter Notebook

```
In [ ]: 1 #Video_A
2 #นับจำนวนรวม
3 import cv2
4 cap = cv2.VideoCapture("../video/41_Video_A.mp4")
5
6 fourcc = cv2.VideoWriter_fourcc(*'MP4V')
7 out = cv2.VideoWriter('../video/41_Video_A_count.mp4', fourcc, 30, (540,960))
8
9 object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
10 ret, frame = cap.read()
11 height, width = frame.shape[:2]
12 referenceLine = int(0.60*height) # 90%
13 ImageWidth = width #print(height,width)
14 positionText = (30,referenceLine-30)
15 nCar = 0
16 BoxInline_y = 1
17 BoxInline_x = 1
18 while(cap.isOpened()):
19     ret, frame = cap.read()
20     height, width, _ = frame.shape
21     BoxInline_y = BoxInline_x
22     BoxInline_x = 0
23     roi = frame[0: 960,0: 540]
24     mask = object_detector.apply(roi)
25     _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
26     contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)
27     for cnt in contours:
28         area = cv2.contourArea(cnt)
29         if area > 9000:
30             x, y, w, h = cv2.boundingRect(cnt)
31             cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
32             if y < referenceLine and (y+h) > referenceLine:
33                 BoxInline_x = 1
34             if BoxInline_y==0 and BoxInline_x==1:
35                 nCar = nCar + 1
36                 textShow = str(nCar)+'-'+str(BoxInline_x)+'-'+str(BoxInline_y)
37                 cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
38                 cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)
39                 cv2.imshow("M.Frame", frame)
40                 #cv2.imshow("Contours", roi)
41                 key = cv2.waitKey(30)
42                 out.write(frame)
43                 if cv2.waitKey(1) & 0xFF == 27: # ESC Key
44                     break
45
46 cap.release()
47 cv2.destroyAllWindows()
```

Code Python3

```
#Video_A
#นับจำนวนรวม
import cv2
cap = cv2.VideoCapture("../video/41_Video_A.mp4")

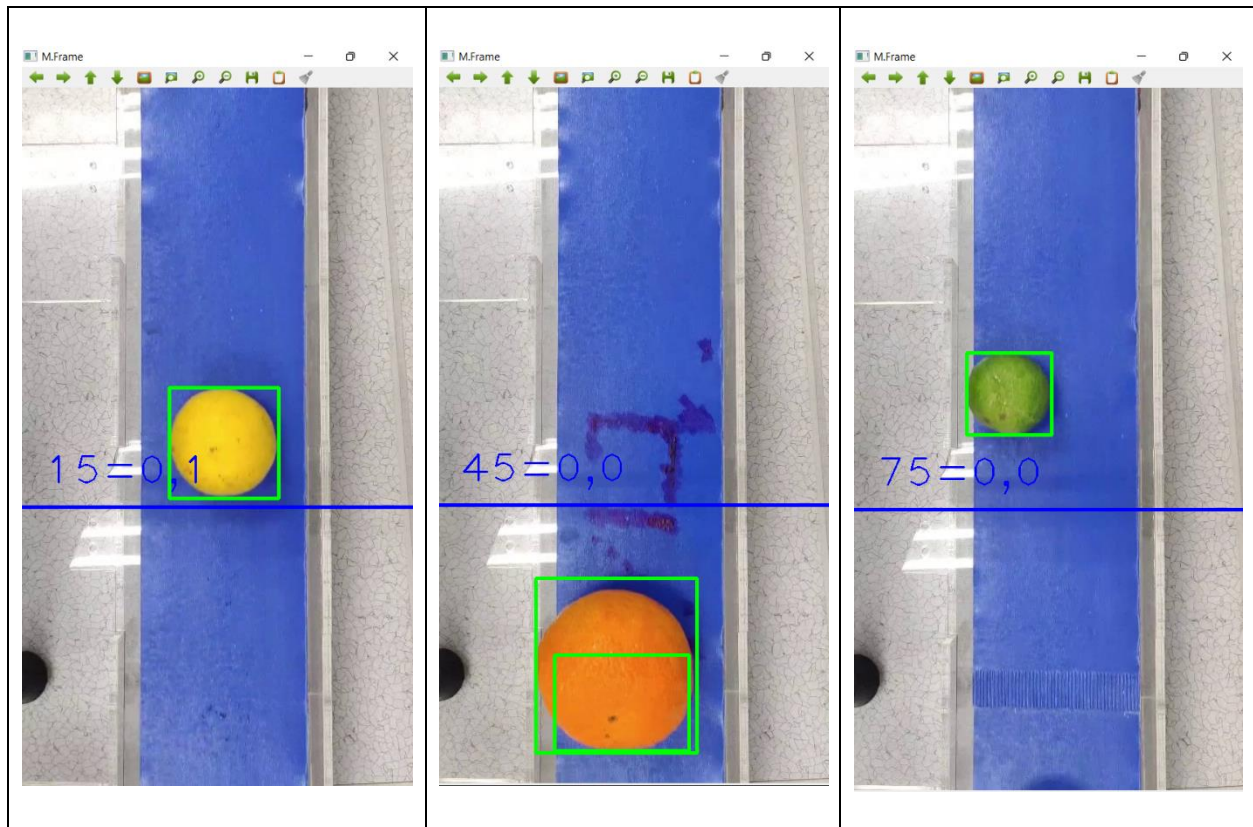
fourcc = cv2.VideoWriter_fourcc(*'MP4V')
out = cv2.VideoWriter('../video/41_Video_A_count.mp4', fourcc, 30, (540,960))

object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.60*height) # 90%
ImageWidth = width #print(height,width)
positionText = (30,referenceLine-30)
nCar = 0
BoxInline_y = 1
BoxInline_x = 1
while(cap.isOpened()):
    ret, frame = cap.read()
    height, width, _ = frame.shape
    BoxInline_y = BoxInline_x
    BoxInline_x = 0
    roi = frame[0: 960,0: 540]
    mask = object_detector.apply(roi)
    _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
    contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)
    for cnt in contours:
        area = cv2.contourArea(cnt)
```

```
if area > 9000:
    x, y, w, h = cv2.boundingRect(cnt)
    cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
    if y < referenceLine and (y+h) > referenceLine:
        BoxInline_x = 1
if BoxInline_y==0 and BoxInline_x==1:
    nCar = nCar + 1
textShow = str(nCar)+'='+str(BoxInline_x)+' '+str(BoxInline_y)
cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)
cv2.imshow("M.Frame", frame)
#cv2.imshow("Contours", roi)
key = cv2.waitKey(30)
out.write(frame)
if cv2.waitKey(1) & 0xFF == 27: # ESC Key
    break

cap.release()
cv2.destroyAllWindows()
```

ผลการทำงาน



วิดีโอผลการทำงาน

<https://youtu.be/lKVkur6cUm0>

บันทึกผลในตาราง

รายการ	จำนวนชิ้นงานจริง	ผลการนับด้วยโปรแกรม	ผลต่าง	ถูกต้อง(%)
Video_A	77	77	0	100%

Video_B_Count

รูปโปรแกรม Jupyter Notebook

```
In [2]: 1 #Video_B #นับจำนวนรวม
2 import cv2
3 cap = cv2.VideoCapture("../video/42_Video_B.mp4")
4 fourcc = cv2.VideoWriter_fourcc(*'MP4V')
5 frame_width = int(cap.get(cv2.CAP_PROP_FRAME_WIDTH))
6 frame_height = int(cap.get(cv2.CAP_PROP_FRAME_HEIGHT))
7 out = cv2.VideoWriter('../video/42_Video_B_Count.avi', fourcc, 30, (frame_width, frame_height))
8 object_detector = cv2.createBackgroundSubtractorMOG2()
9
10 ret, frame = cap.read()
11 height, width = frame.shape[:2]
12 referenceLine = int(0.60*height) # 90%
13 ImageWidth = width
14 #print(height,width)
15 positionText = (30,referenceLine-30)
16 nCar = 0
17 BoxInline_y = 1
18 BoxInline_x = 1
19
20 while(cap.isOpened()):
21     ret, frame = cap.read()
22     if frame is None:
23         break
24     BoxInline_y = BoxInline_x
25     BoxInline_x = 0
26
27     mask = object_detector.apply(frame)
28     contours, _ = cv2.findContours(mask, cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_SIMPLE)
29     for cnt in contours:
30         # Calculate area and remove small elements
31         area = cv2.contourArea(cnt)
32         if area > 1000:
33             cv2.drawContours(frame, [cnt], -1, (0, 255, 0), 2)
34             x, y, w, h = cv2.boundingRect(cnt)
35             cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 0, 255), 3)
36
37             if y < referenceLine and (y+h) > referenceLine:
38                 BoxInline_x = 1
39
40     if BoxInline_y==0 and BoxInline_x==1:
41         nCar = nCar + 1
42
43     textShow = str(nCar)+'-'+str(BoxInline_x)+'-'+str(BoxInline_y)
44     cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
45     cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)
46
47     cv2.imshow("Mask", mask)
48     cv2.imshow("Frame", frame)
49     out.write(frame)
50     if cv2.waitKey(1) & 0xFF == 27: # ESC Key
51         break
52 cap.release()
53 cv2.destroyAllWindows()
```

Code Python3

```
#Video_B #นับจำนวนรวม
import cv2
cap = cv2.VideoCapture("../video/42_Video_B.mp4")
fourcc = cv2.VideoWriter_fourcc(*'MP4V')
frame_width = int(cap.get(cv2.CAP_PROP_FRAME_WIDTH))
frame_height = int(cap.get(cv2.CAP_PROP_FRAME_HEIGHT))
out = cv2.VideoWriter('../video/42_Video_B_Count.avi', fourcc, 30, (frame_width,
frame_height))
object_detector = cv2.createBackgroundSubtractorMOG2()

ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.60*height) # 90%
ImageWidth = width
#print(height,width)
positionText = (30,referenceLine-30)
nCar = 0
BoxInline_y = 1
BoxInline_x = 1

while(cap.isOpened()):
    ret, frame = cap.read()
    if frame is None:
        break
    BoxInline_y = BoxInline_x
    BoxInline_x = 0

    mask = object_detector.apply(frame)
```

```

contours, _ = cv2.findContours(mask, cv2.RETR_EXTERNAL, cv2.CHAIN_APPROX_SIMPLE)
for cnt in contours:
    # Calculate area and remove small elements
    area = cv2.contourArea(cnt)
    if area > 1000:
        cv2.drawContours(frame, [cnt], -1, (0, 255, 0), 2)
        x, y, w, h = cv2.boundingRect(cnt)
        cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 0, 255), 3)

        if y < referenceLine and (y+h) > referenceLine:
            BoxInline_x = 1

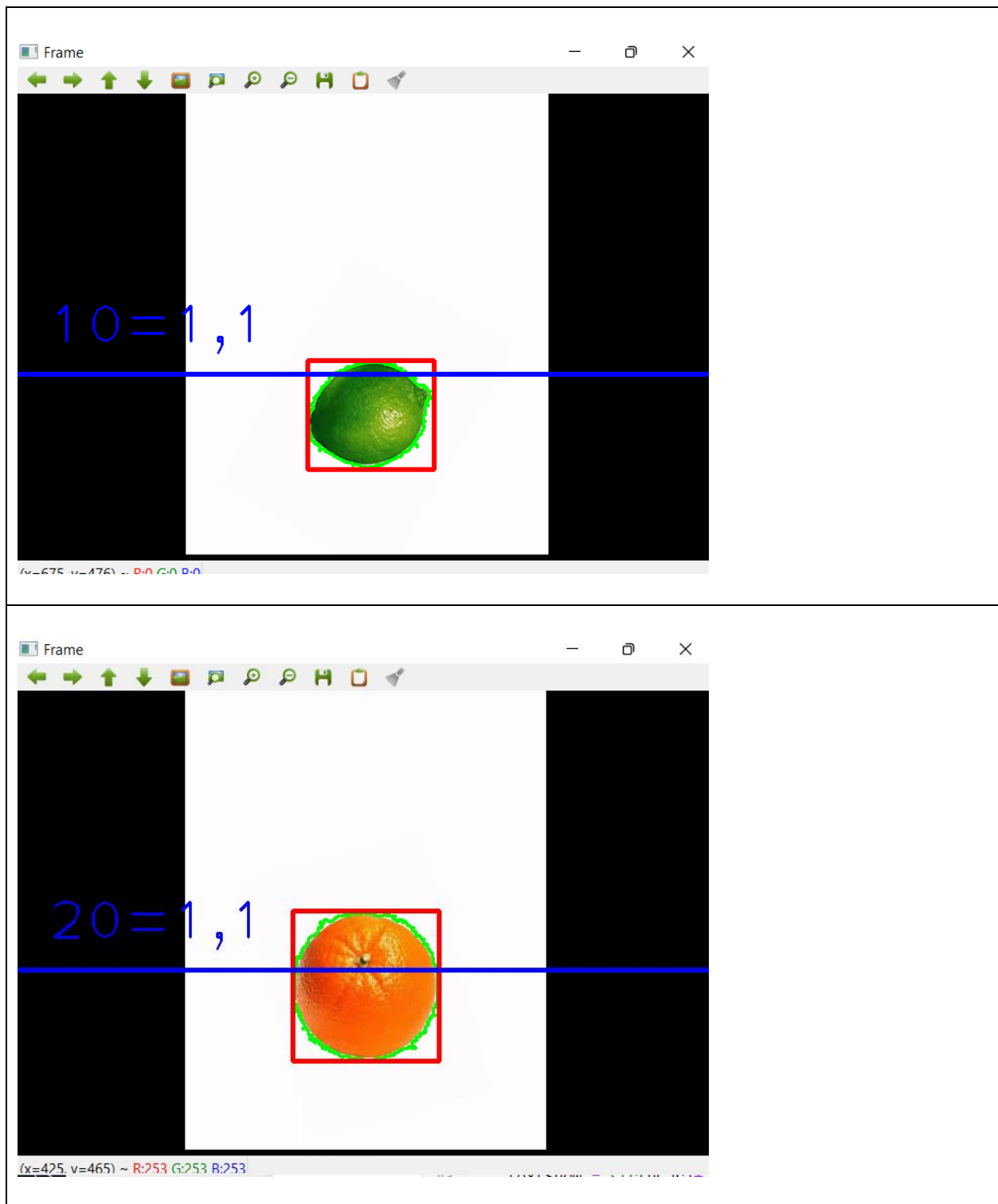
if BoxInline_y==0 and BoxInline_x==1:
    nCar = nCar + 1

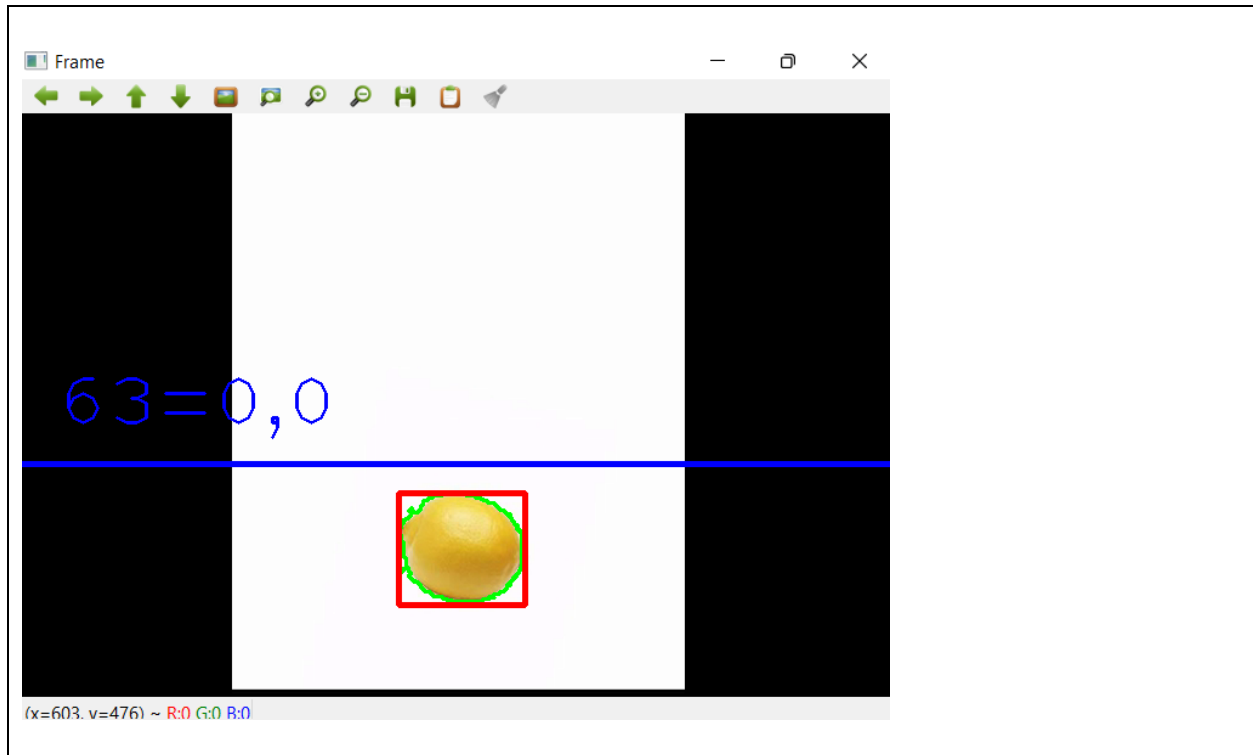
textShow = str(nCar)+'='+str(BoxInline_x)+'/'+str(BoxInline_y)
cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(255, 0, 0), 3)
cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 4, (255, 0, 0), 2)

cv2.imshow("Mask", mask)
cv2.imshow("Frame", frame)
out.write(frame)
if cv2.waitKey(1) & 0xFF == 27: # ESC Key
    break
cap.release()
cv2.destroyAllWindows()

```

ผลการทำงาน





วิดีโอผลการทำงาน

<https://youtu.be/gRJxLdb8ZNs>

บันทึกผลในตาราง

รายการ	จำนวนชิ้นงานจริง	ผลการนับด้วยโปรแกรม	ผลต่าง	ถูกต้อง(%)
Video_B	80	80	0	100%

Video_C_Count

รูปโปรแกรม Jupyter Notebook

```
In [*]: 1 #Video_C นับรวม
2 import cv2
3 cap = cv2.VideoCapture("../video/43_Video_C.avi")
4 fourcc = cv2.VideoWriter_fourcc(*'XVID')
5 out = cv2.VideoWriter('../video/video_C3.avi', fourcc, 30, (540,960))
6
7 object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
8 ret, frame = cap.read()
9 height, width = frame.shape[:2]
10 referenceLine = int(0.30*height) # 90%
11 positionText = (10,referenceLine-30)
12 ImageWidth = width
13 All = 0
14 BoxInline_y = 1
15 BoxInline_x = 1
16 while(cap.isOpened()):
17     ret, frame = cap.read()
18     height, width, _ = frame.shape
19     BoxInline_y = BoxInline_x
20     BoxInline_x = 0
21     roi = frame[0: 960,50: 490]
22     mask = object_detector.apply(roi)
23     _, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
24     contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)
25
26     for cnt in contours:
27         area = cv2.contourArea(cnt)
28         if area > 9000:
29             x, y, w, h = cv2.boundingRect(cnt)
30             cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
31             if y < referenceLine and (y+h) > referenceLine:
32                 BoxInline_x = 1
33     if BoxInline_y==0 and BoxInline_x==1:
34         All = All + 1
35
36     #textShow = str(All)+'='+str(BoxInline_x)+''+str(BoxInline_y)
37     textShow = 'All = ' + str(All)
38
39     cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(0, 0, 255), 3)
40     cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 2, (0, 0, 255), 2)
41     cv2.imshow("M.Frame", frame)
42     cv2.imshow("Contours", mask)
43     key = cv2.waitKey(30)
44     #out.write(frame)
45     if cv2.waitKey(1) & 0xFF == 27: # ESC Key
46         break
47
48 cap.release()
49 cv2.destroyAllWindows()
```

Code Python3

```
#Video_C นับรวม
import cv2
cap = cv2.VideoCapture("../video/43_Video_C.avi")

fourcc = cv2.VideoWriter_fourcc(*'XVID')
out = cv2.VideoWriter('../video/video_C3.avi', fourcc, 30, (540,960))

object_detector = cv2.createBackgroundSubtractorMOG2(history=100, varThreshold=40)
ret, frame = cap.read()
height, width = frame.shape[:2]
referenceLine = int(0.30*height) # 90%
positionText = (10,referenceLine-30)

ImageWidth = width
All = 0

BoxInline_y = 1
BoxInline_x = 1

while(cap.isOpened()):
    ret, frame = cap.read()
    height, width, _ = frame.shape

    BoxInline_y = BoxInline_x
    BoxInline_x = 0

    roi = frame[0: 960,50: 490]
```

```

mask = object_detector.apply(roi)
_, mask = cv2.threshold(mask, 254, 255, cv2.THRESH_BINARY)
contours, _ = cv2.findContours(mask, cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)

for cnt in contours:
    area = cv2.contourArea(cnt)
    if area > 9000:
        x, y, w, h = cv2.boundingRect(cnt)
        cv2.rectangle(roi, (x, y), (x + w, y + h), (0, 255, 0), 3)
        if y < referenceLine and (y+h) > referenceLine:
            BoxInline_x = 1
if BoxInline_y==0 and BoxInline_x==1:
    All = All + 1

#textShow = str(All)+'='+str(BoxInline_x)+''+str(BoxInline_y)
textShow = 'All = ' + str(All)

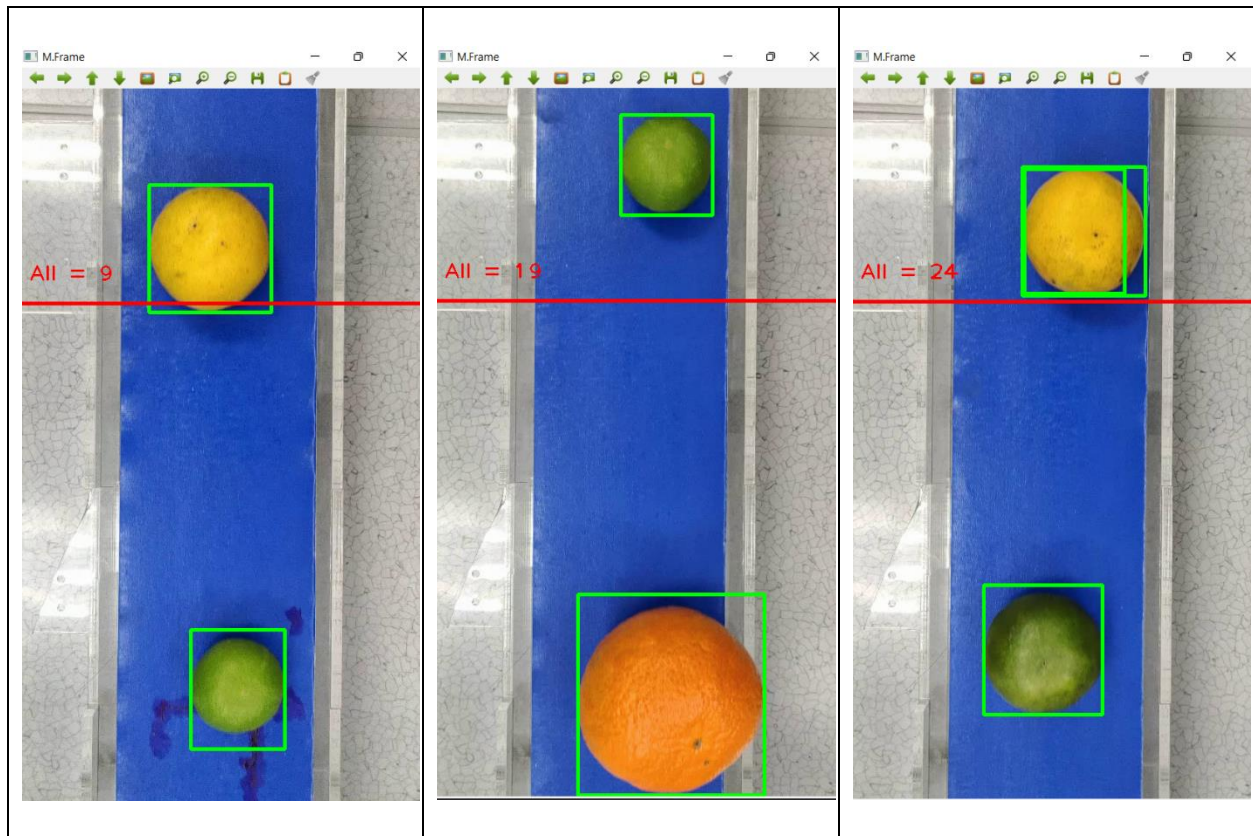
cv2.line(frame,(0,referenceLine),(ImageWidth,referenceLine),(0, 0, 255), 3)
cv2.putText(frame,textShow , positionText, cv2.FONT_HERSHEY_PLAIN, 2, (0, 0, 255), 2)

cv2.imshow("M.Frame", frame)
cv2.imshow("Contours", mask)
key = cv2.waitKey(30)
#out.write(frame)
if cv2.waitKey(1) & 0xFF == 27: # ESC Key
    break

cap.release()
cv2.destroyAllWindows()

```

ผลการทำงาน



วิดีโอผลการทำงาน

<https://youtu.be/NezJAL54ES0>

บันทึกผลในตาราง

รายการ	จำนวนชิ้นงานจริง	ผลการนับด้วยโปรแกรม	ผลต่าง	ถูกต้อง(%)
Video_C	100	103	-3	97%