# Lab03

Background subtraction
Threshold
Connected component

# 輸入一段影片



# 輸出成果

Background subtraction



Threshold



Connected component



框出前景



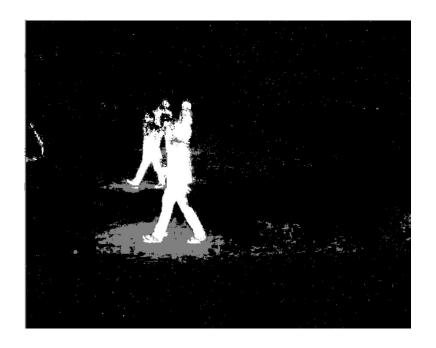
#### 0. 讀取影片

影片(video)是由連續的影像(image)組成, 組成影片的影像稱為影格(frame), 影片播放時會不斷呈現新的影格, 影格間的時間稱作更新頻率(frame rate)。

- cap = cv2.VideoCapture(filename)
- cap.isOpened()
  - 檢查影片是否被成功讀取
- ret, frame = capture.read()
  - 不斷讀取來源影格, 把資訊寫進rame
- cv2.imshow("frame", videoFrame)
  - 顯示影片
- cv2.waitKey(33)
  - 等待幾毫秒再讀取下一禎

### 1. Background Subtraction

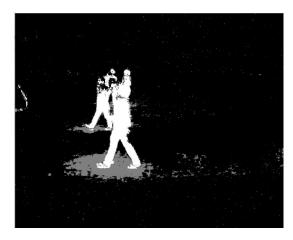
- backSub = cv2.createBackgroundSubtractorMOG2()
  - 創造一個BackgroundSubtractor
- fgmask = backSub.apply(frame)
  - o 用在frame上面

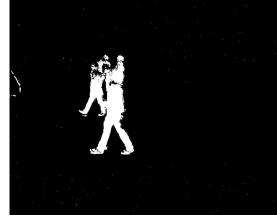


#### 2. Threshold

- shadowval = backSub.getShadowValue()
  - 找出shadow的值, default = 127, 0: background, 255: foreground
- ret, nmask = cv2.threshold(fgmask, shadowval, 255, cv2.THRESH\_BINARY)
  - 輸出圖片

輸入圖片 threshold最小值 最大值 method





#### 3. Connected Component

Two-Pass Algorithm:

#### Pass 1:

- Perform label assignment and label propagation.
- Construct the equivalence relations between labels when two different labels propagate to the same pixel.
- Apply resolve function to find the transitive closure of all equivalence relations.

#### Pass 2:

Perform label translation

### 3. Connected Component

- 找connected component時,要同時計算相連區域面積
- 若相連區域面積 > T, 找出相連區域最外圍的四個邊

## 4. 框出物體

- opencv畫矩形
  - o cv2.rectangle(影像, (頂點座標), (對向頂點座標), 顏色, 線條寬度)

