

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frame
- `cv2.imshow("frame", videoFrame)`
 - 顯示影片
- `cv2.waitKey(33)`
 - 等待幾毫秒再讀取下一幀

1. Background Subtraction

- `backSub = cv2.createBackgroundSubtractorMOG2()`
 - 創造一個 BackgroundSubtractor
- `fgmask = backSub.apply(frame)`
 - 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
 - `cv2.rectangle(影像, (頂點座標), (對向頂點座標), 顏色, 線條寬度)`

