# CS4243 Lab 3

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import cv2

import cv2.cv as cv

import numpy as numpy

im = cv2.imread('LabPhoto1.jpg', cv2.CV\_LOAD\_IMAGE\_COLOR)

gr = cv2.imread('LabPhoto1.jpg', cv2.CV\_LOAD\_IMAGE\_GRAYSCALE)

# Pops up a window for displaying the CV\_LOAD\_IMAGE\_GRAYSCALE

winname = 'imageWin'

win = cv.NamedWindow(winname, cv.CV\_WINDOW\_AUTOSIZE)

cv2.putText(im, 'motion', (20, 20), cv2.FONT\_HERSHEY\_COMPLEX\_SMALL, 1, (255, 255, 255))

cv2.imshow('motion image', im)

cv2.waitKey(1000)

cv.DestroyWindow(winname)

invid = cv2.VideoCapture('LabVideo.MOV')

width = int(invid.get(cv.CV\_CAP\_PROP\_FRAME\_WIDTH))

height = int(invid.get(cv.CV\_CAP\_PROP\_FRAME\_HEIGHT))

fps = int(invid.get(cv.CV\_CAP\_PROP\_FPS))

length = int(invid.get(cv.CV\_CAP\_PROP\_FRAME\_COUNT))

for i in range(length):

\_, im = invid.read()

if i % 3 == 0:

cv2.imshow('fastForward',im)

cv2.waitKey(100)

del invid

cv2.destroyAllWindows()

# Lab 3

IMAGE\_1\_FILENAME = 'LabPhoto1.jpg'

IMAGE\_1\_GRAY\_FILENAME = 'grayImage1.jpg'

IMAGE\_2\_FILENAME = 'LabPhoto2.jpg'

IMAGE\_2\_GRAY\_FILENAME = 'grayImage2.jpg'

IMAGE\_1\_TRACKING\_FILENAME = 'LabPhotoTracking1.jpg'

IMAGE\_2\_TRACKING\_FILENAME = 'LabPhotoTracking2.jpg'

TEXT\_ORIGIN = (20, 20)

TEXT\_FONT = cv2.FONT\_HERSHEY\_COMPLEX\_SMALL

TEXT\_FONT\_SCALE = 1

TEXT\_FONT\_COLOR = (255, 255, 255)

TRACKING\_CORNER\_COUNT = 200

TRACKING\_QUALITY\_LEVEL = 0.001

TRACKING\_MIN\_DISTANCE = 9.0

im1 = cv2.imread(IMAGE\_1\_FILENAME, cv2.CV\_LOAD\_IMAGE\_COLOR)

im2 = cv2.imread(IMAGE\_2\_FILENAME, cv2.CV\_LOAD\_IMAGE\_COLOR)

im1\_height, im1\_width, im1\_depth = im1.shape

im2\_height, im2\_width, im2\_depth = im2.shape

print 'Dimensions of', IMAGE\_1\_FILENAME, ':', im1\_height, 'x', im1\_width

print 'Dimensions of', IMAGE\_2\_FILENAME, ':', im2\_height, 'x', im2\_width

grImg1 = cv2.cvtColor(im1, cv2.COLOR\_BGR2GRAY)

cv2.putText(grImg1, IMAGE\_1\_FILENAME, TEXT\_ORIGIN, TEXT\_FONT, TEXT\_FONT\_SCALE, TEXT\_FONT\_COLOR)

cv2.imshow(IMAGE\_1\_GRAY\_FILENAME, grImg1)

cv2.imwrite(IMAGE\_1\_GRAY\_FILENAME, grImg1)

grImg2 = cv2.cvtColor(im2, cv2.COLOR\_BGR2GRAY)

cv2.putText(grImg2, IMAGE\_2\_FILENAME, TEXT\_ORIGIN, TEXT\_FONT, TEXT\_FONT\_SCALE, TEXT\_FONT\_COLOR)

cv2.imshow(IMAGE\_2\_GRAY\_FILENAME, grImg2)

cv2.imwrite(IMAGE\_2\_GRAY\_FILENAME, grImg2)

feat1 = cv2.goodFeaturesToTrack(grImg1, TRACKING\_CORNER\_COUNT, TRACKING\_QUALITY\_LEVEL, \

TRACKING\_MIN\_DISTANCE).reshape((-1, 2))

criteria = (cv.CV\_TERMCRIT\_ITER | cv.CV\_TERMCRIT\_EPS, 80, 0.0001)

win = (3, 3) # actual size is 3\*2+1 x 3\*2+1

zero\_zone = (-1, -1) # no dead zone

cv2.cornerSubPix(grImg1, feat1, win, zero\_zone, criteria)

feat2 = np.copy(feat1)

feat2, status, err = cv2.calcOpticalFlowPyrLK(grImg1, grImg2, feat1, feat2)

print feat1

print feat2

im1 = cv2.imread(IMAGE\_1\_FILENAME, cv2.CV\_LOAD\_IMAGE\_COLOR)

cv2.namedWindow('Picture1')

for (x, y) in feat1:

cv2.circle(im1, (int(x), int(y)), 3, (255, 255, 255), -1)

cv2.imshow("Picture1", im1)

cv2.imwrite(IMAGE\_1\_TRACKING\_FILENAME, im1)

im2 = cv2.imread(IMAGE\_2\_FILENAME, cv2.CV\_LOAD\_IMAGE\_COLOR)

cv2.namedWindow('Picture2')

for (x, y) in feat2:

cv2.circle(im2, (int(x), int(y)), 3, (255, 255, 255), -1)

cv2.imshow("Picture2", im2)

cv2.imwrite(IMAGE\_2\_TRACKING\_FILENAME, im2)

if cv2.waitKey(0) == 27:

cv2.destroyAllWindows() # Save marked images.

**Question 7**

Picture 1



Picture 2



**Question 8**

Picture 1 Marked (Points in black circles)



The tracking was wrong for the points circled in black because they were not very distinct corners.

The points circled in red are good corners but they aren’t real features. They are created from the superposition of two objects. Hence they should not be tracked.