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CS-583-001
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Assignment 3: Optical Flow Tracking

Struggles:

I struggled with the tracking object and pyramind_lucas kanade and gaussian pyramid. It took me a while to understand how to decimate the images and using decimate images. Original I had an error of in the test_pyramind_lucas_kanade which was 4.007922 != 4.179228 within 2 places (0.17130582745361345 difference) : The displacement returned [4.007922 1.998926] was not as expected [4.179228 2.0011392]. I was able to figure out my mistake that I have not been using the convolve_img function but rather build in convolve scipy function and convolve image rgb (0,1,2). I made the edits and change to the convolve_img function and all the test passed.

Results:

Test Case results

```
nj398@tux1:~/hw3$ python3 hw3_test.py -v
test_gaussian_pyramid (__main__.Homework3Test) ... ok
test_iterative_lucas_kanade (__main__.Homework3Test) ... ok
test_lucas_kanade (__main__.Homework3Test) ... ok
test_pyramid_lucas_kanade (__main__.Homework3Test) ... ok

----------------------------------------------------------------------
Ran 4 tests in 0.076s

OK
```

Bounding box on the first image and it's tracked location on the second image:

Orginial Example

```
python3 hw3.py --boundingBox 304,329,106,58  middlebury/Army/frame07.png
middlebury/Army/frame14.png
```

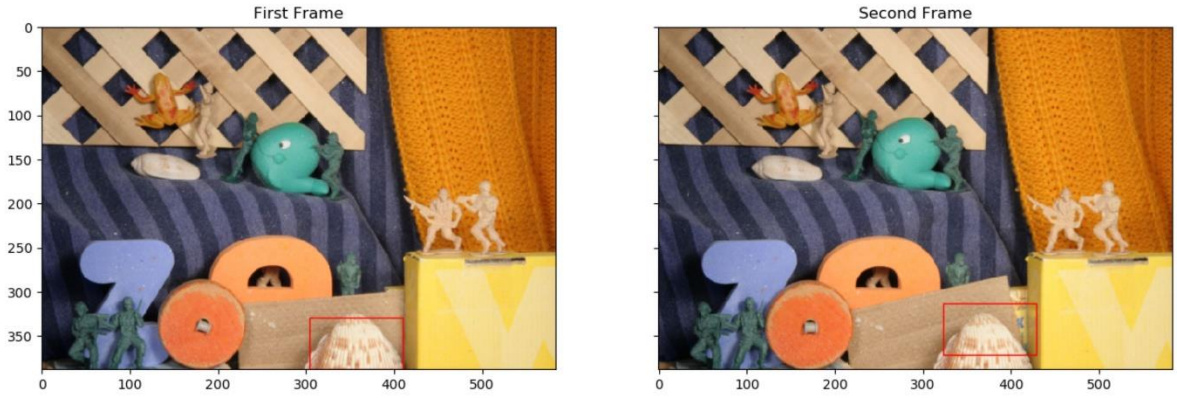
```
python3 hw3.py --visualize --boundingBox 304,329,106,58  middlebury/Army/frame07.png
middlebury/Army/frame14.png
```

Input: frame07.png

Input: frame14.png

Output Result:

```
nj398@tux1:~/hw3$ python3 hw3.py --visualize --boundingBox 304,329,106,58  middlebury/Army/frame07.png middlebury/Army/frame14.png
tracked object to have moved [ 18.844032 -15.546313] to (322.84402, 313.45367)
```



My Own Example

```
python3 hw3.py --boundingBox 221,177,48,76  inputtest1.jpg inputtest2.jpg
```

These are my two images, there is motion change between two images. You can see by the window white line, you can also check it out by moving back and forth with the images.

Input: inputtest1.jpg

Input: inputtest2.jpg

Output Result:

Tracked object to be moved:

```
nj398@tux1:~/hw3$ python3 hw3.py --visualize --boundingBox 221,177,48,76 inputtest1.jpg inputtest2.jpg
tracked object to have moved [-0.13468796  4.800949  ] to (220.86531, 181.80095)
```

Visual image: