Estimating Motion and Object Detection Using Deep Neural Net

- The program is written in Python 3.7.
- The program is divided in two parts in the first part an open source software YOLOv3 is been utilized with opencv to detect objects in video frame and in the second part motion is detected using the difference between consecutive sequence of images.
- There are few constraints in the program i.e small motion and window size

Input/Output:

- The program loads a video file and loads it through open cv module and preprocess each frame in the video to detect motion and objects with different classes.
- The program adds contours around an object or motion in each image frame and writes in out in a mp4 video file stored in output_video folder.
- The program takes the images frames at the 75th position and stores in the output_image folder for further analysis.
- The programs requires to have the following files for execution:

```
"coco.names"
'yolov3.cfg'
'yolov3.weights'
```

Running the program

- Install Libraries:
  pip3 install numpy
  pip3 install opencv-contrib-python

- python3 motionDetection.py motion video_file
  For example: python3 motionDetection.py motion test_videos/test_video3.mp4

- python3 motionDetection.py objectDetection video_file
  For example: python3 motionDetection.py motion test_videos/test_video3.mp4

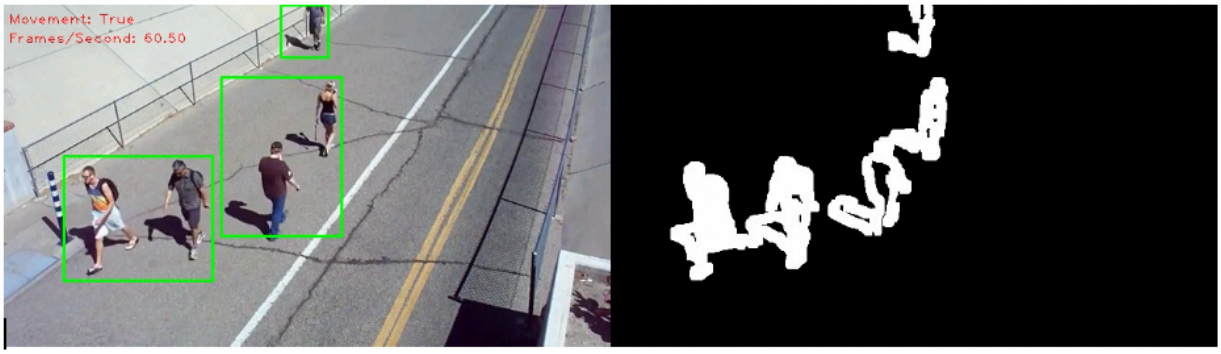
#Samle output

- Images with bounding box for motion detection saved in output_images
- Videos with bounding box for motion detection saved in output_videos
- Images with bounding box and class name for object detection saved in output_images
- Videos with bounding box and class name for object detection saved in output_vi

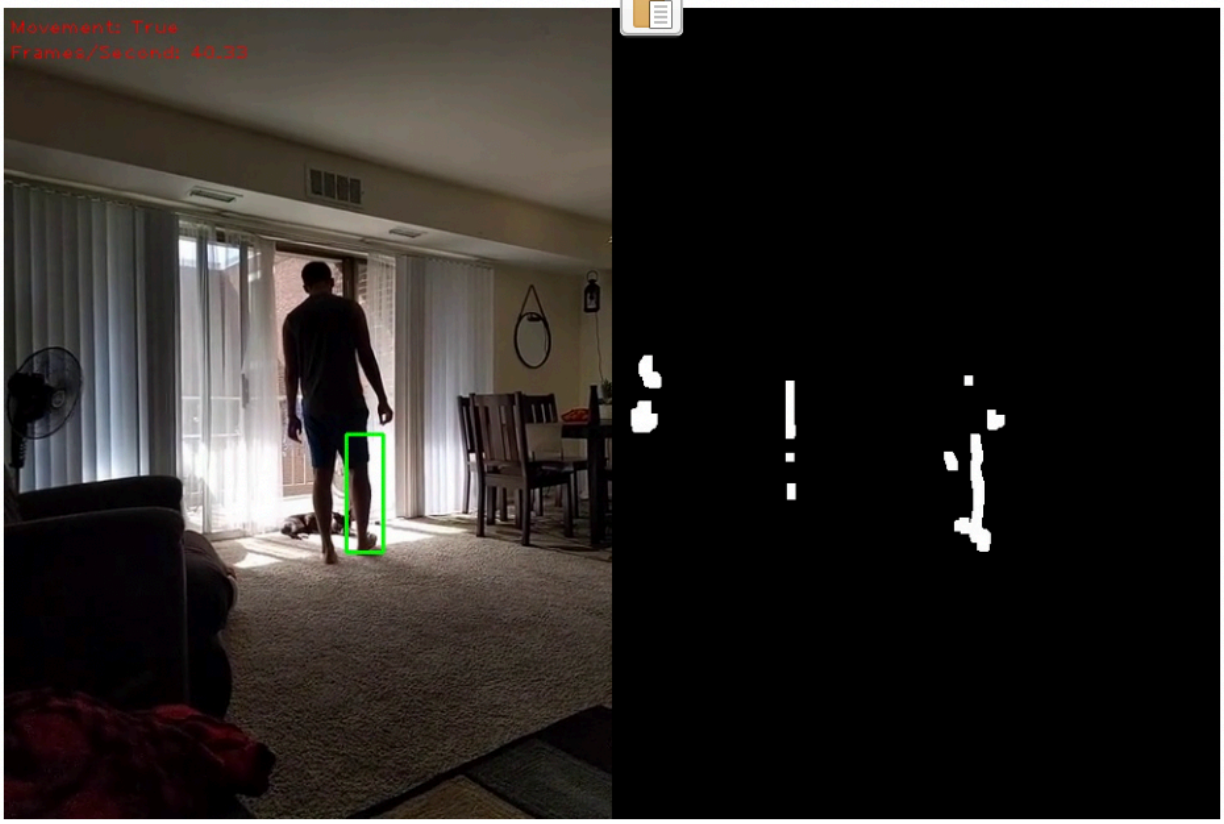

person:0.92
person:0.98
person:0.99
person:0.72


Movements Total:
Frames/Second: 45.09


person:0.99
person:0.98
person:0.99


Movement: True
Frames/Second: 60.50


person:1.00
sofa:0.90


Movement: True
Frames/Second: 40.33


person:0.84
chair:0.92
Movement: True
Frames/Second: 38.00