Algorithm

For every video for every frame :

1. Clear the noise from frame with Gaussian filter;

2. Extract Background;

3. Clear the noise from background;

4. Find contours on background;

5. Filter small contours with sides greater than MIN_RECT_SIZE;

6. Compare contours from previous frame with contours on current frame;

7. if there are intersected frames of almost equal size (difference in SIZE_CHANGE times) on different frames, than we increase Time To Live (TTL) for them and store the contours from the last frame with current TTL;

8. If current TTL reach TTL_THRESHOLD then new object is on the scene for a long time;

9. If the object with big TTL was lost on the current frame, we put it to the temporary storage;

10. If it is not found for 5 frames than delete this contours and report it;
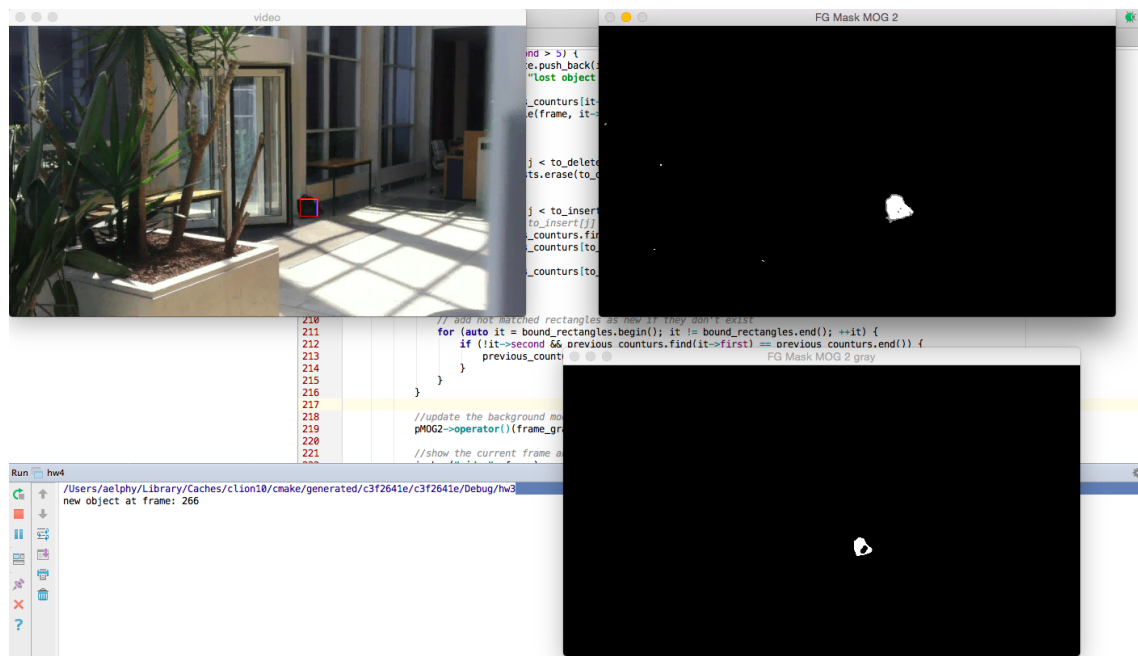
Here are a few results of image processing:
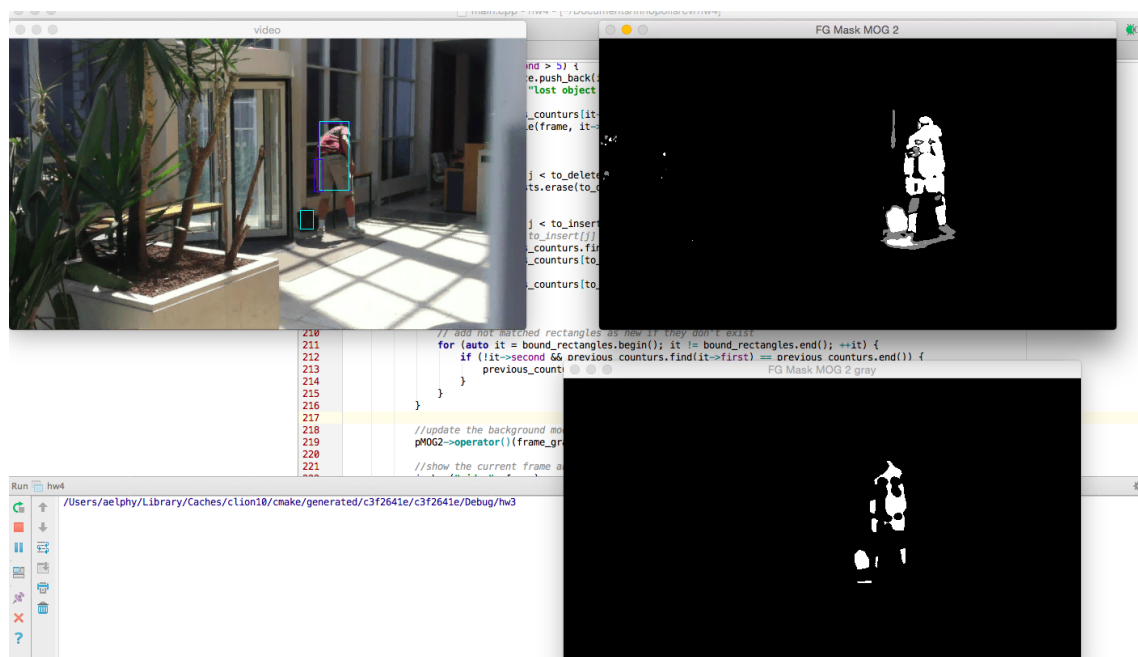
Figure 1: "Left thing was recognised"

Figure 2: "Left thing is not yet recognised"

Results

The results of the program:

video 1

new object at frame: 266 lost object at frame: 403

video 2

new object at frame: 224 new object at frame: 240 lost object at frame: 409 lost object at frame: 429

two objects on video two are because of the light divided backpack into two visual parts.