**Sensitive Motion Detection**

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**Introduction**

In our final projects We introduce the “Sensitive Motion Detection” algorithm. This algorithm goal is to detect moving object in a scene where the camera stands still (security camera for example), and alarm when an unapproved object is passing in the scene but ignore when an approved object is passing. The differentiation between approved and unapproved objects is based on preprocessing the data of the approved objects and store it in a database (deeper description in the ‘Algorithm Description’ section).

We wish to implement the algorithm based on classic computer-vision methods and not based on machine learning or deep learning methods which have more common usage for this kind of task these days.

**Related Work**

**Algorithm Description**

The algorithm final purpose is to alarm/not alarm when a given video is fed into it. The algorithm flow is based on 3 main parts to achieve this result-

Preprocessing-

This part of the algorithm is meant to give it a pre knowledge about the objects which are approved by the user (For example, if we are using a security camera and we own a dog, we would like to “tell” the algorithm that our dog is approved so the algorithm will not alarm each time the dog is passing in the camera view).

The information the algorithm requires for each approved object is-

1. A histogram of the object pattern for each of the RGB channels. The user can provide as many histograms he wishes to provide more information to the algorithm (for example, RGB histograms of our house dog both in bright room and dark room).
2. The location of the object in a given frame and his size in it.

Both 1 and 2 are stored in a database that will be used in the ‘Object Detection’ part.

Change Detection-

Object Detection-

This part is using both the preprocessing data and the data generated from the ‘Change Detection’ part. For each frame in the video, the algorithm compares each of the detected objects information returned from the change detection with the approved objects information from the preprocessing part. The information compared is the RGB histograms and the size.

If the algorithm finds a match between one of the approved objects and a detected object, it will mark the detected object as recognized in the given frame.

**Used Methods**

* **Change detection**
* **Histograms comparison**
* **Size matching (our own algorithm)**

**Data Used**

**Results Summary**

**Future Work**