REPORT

Assignment 1 - Background subtraction

Entry No. - 2015CS10240

AIM:

To generate a foreground mask (a binary image containing the pixels belonging to moving objects in the scene) by using static cameras and background subtraction methods. Comparing the results with Open CV implementation.

OBSERVATION:

The background subtraction methods give reliable results except in some cases:

1. Shadows:

In open areas, where the source of light moves or there is different light intensity at different point of time, the background subtractor detects those pixels as foreground. As the image changes from 1st to 2nd-> shadow on road is detected as foreground.

My_Implementation

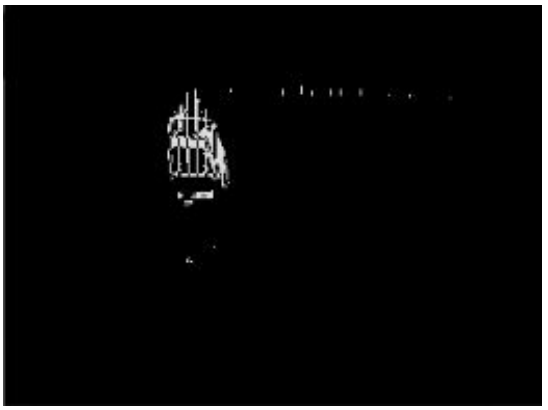
Open_cv implementation

Img 1

Img 2

2.Camouflage:
A person walks in front of a gate, which has bars. The bars include similar color to the person’s clothing.

My_implementation



Open_CV implementation

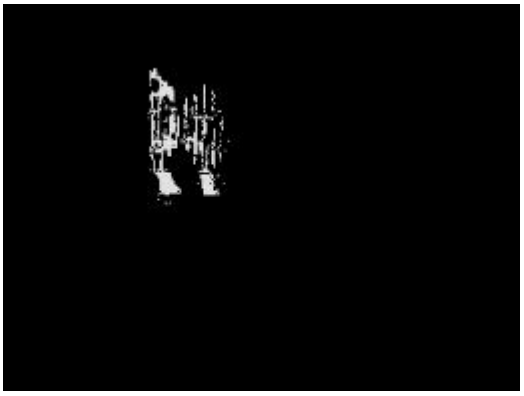
Original_image

3. Moving camera:
Since the background subtraction method must have "static camera", a video made using a moving camera gives erroneous results.

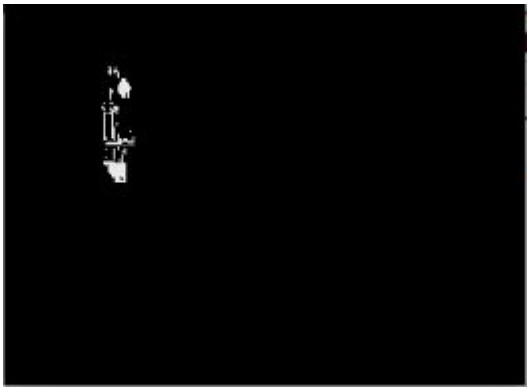
4. Inside room:
If the background subtractor is applied on video shot inside a room, the results are as expected.

5. Initial state of video:
Initialization is done by Expectation maximization, because of which there is a delay in output as compared with Open CV

6. Speed of the object in foregorund:
The foreground image pixels are obtained by subtracting the background image pixels value from the present image.
We update the image pixels at any time only if they are greater than a particular threshold. Therefore the accuracy depends on the speed of movement and hence faster objects require higher thresholds.



My_implementation



Open_cv implementation

Original image

Resources:
Background Modeling using Mixture of Gaussians for Foreground Detection
- A Survey Thierry Bouwmans, Fida El Baf, Bertrand Vachon