Indian Institute of Technology Delhi

ELL 784 - Introduction to Machine Learning

Assignment 1

Background Subtraction

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The hyperparameters are:

1. Learning rate (alpha)
2. Variance
3. Threshold

Learning Rate:

For Learning Rate =
0.001

Foreground:

Background:

Good for Background, but not for Foreground, as the model is not adapting properly.

For Learning rate =

0.005

Foreground:

Background:

Not adapting properly for Foreground.

For Learning rate = 0.01

Foreground:

Background:

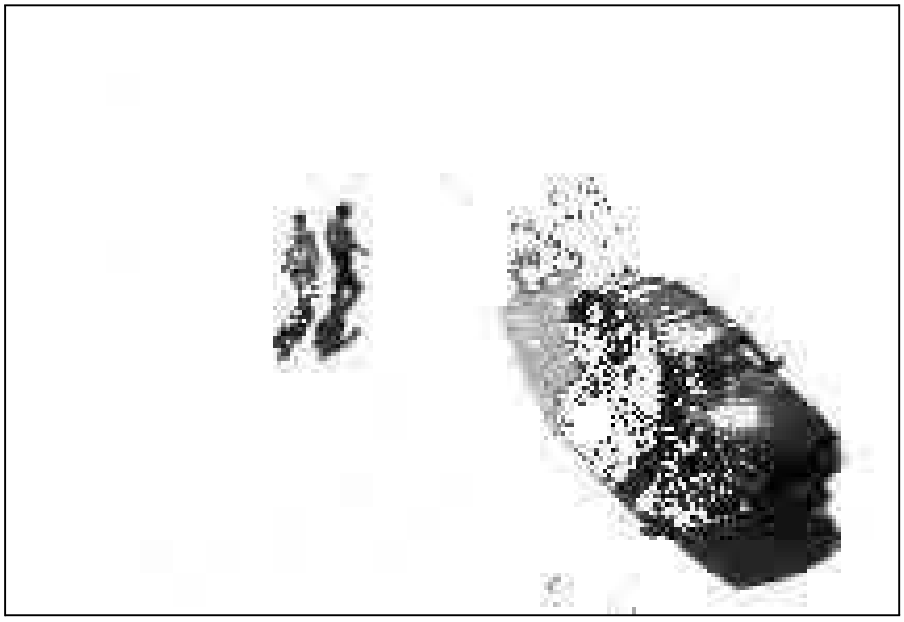
0.01 is adapting quicker than 0.005.

Inference - Having a small Learning rate doesn't adapt to the background properly, so we used 0.01 as our learning rate (alpha).

Variance:

For Variance = 100,

Foreground:

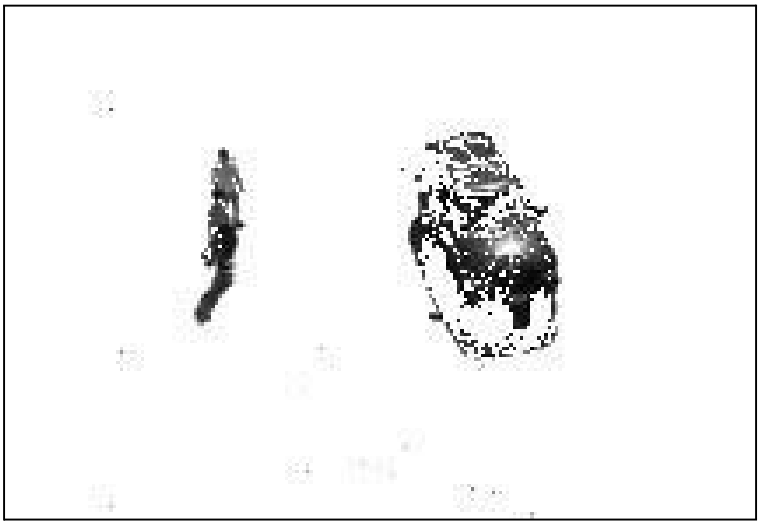


Background:

Not able to separate the background properly.

For Variance = 50,

Foreground:

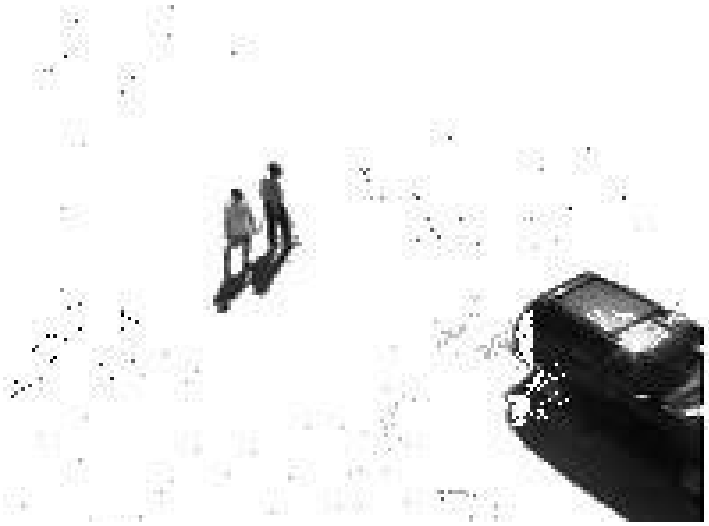


Background:

Not capturing all the movement of Foreground.

For Variance = 20,

Foreground:



Background:

Capturing all the movements properly.

For Variance = 10,
Foreground:

Background:

Not able to capture the foreground and background properly.

Inference - Variance 20 can separate the Foreground and Background properly, so we are using variance 20.

Threshold:

For Threshold = 0.9

Foreground:

Background:

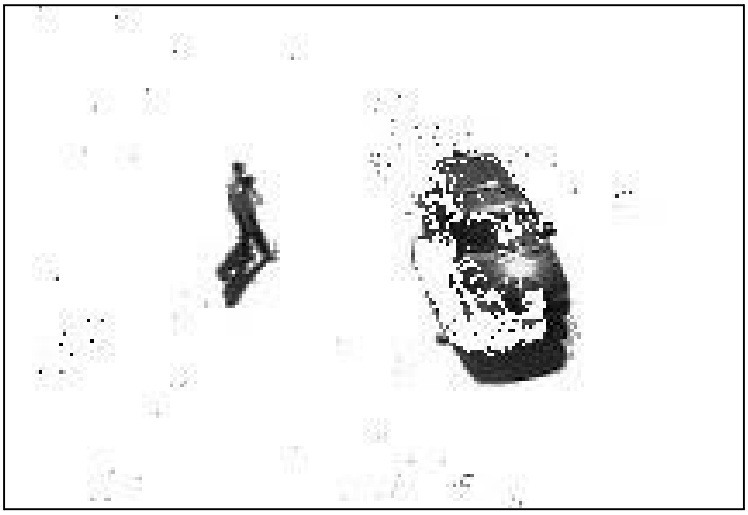
For Threshold = 0.7 Foreground:

Background:

Perfect background subtraction

For Threshold = 0.5

Foreground:



Background:

Inference - Having less threshold makes us less confident of saying that the pixel is the part of background. So, we are using Threshold = 0.7