

Assignment-1 Report

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Video sequence	mIOU score	Link to Output Masks
Baseline	0.8021	https://drive.google.com/drive/folders/16n9LRIZsC7G2cUdPAyWj4JtLiWEyKSpk?usp=sharing
Illumination	0.5617	https://drive.google.com/drive/folders/1PbjDOo3jal5GdbHzTb-IGg1-t5Yk_BRk?usp=sharing
Jitter	0.6679	https://drive.google.com/drive/folders/1XnC_SQzK8HcUfe7Skzy6dctEW-PC10Rs?usp=sharing
Moving Background	0.5010	https://drive.google.com/drive/folders/1gclMxG11SrIp7BEzFLH8KSK7IijmvSE0?usp=sharing

1) Baseline:

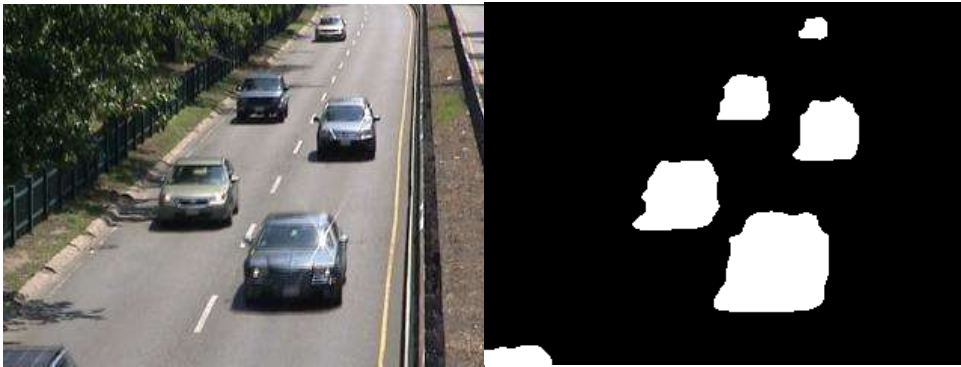


Figure 1: Input and output of a frame

KNN Background subtractor is used to generate the foreground mask, which has a lot of noise. Then the output image is thresholded to 0 and 255 to remove any shadows detected by the subtractor.

The image had salt and pepper noise, hence we used medianBlur which gave best results at kernel size 7.

Then we used the morphological closing operation with an elliptic kernel of size 11 x 11.

Then finally erosion to make the masks slimmer.

2) Illumination:



Figure 2: Input and output of a frame

Closing at a suitable kernel size removes smaller or dark objects, and gives a frame with just brightness information. The idea used is that for a Lambertian surface, if we take the ratio of this intensity and original image, we will get an image with the information about luminance removed.

([source](#))

So first we remove the luminance, then we use MOG Background subtractor to generate a fgMask. Then we remove the noise via applying medianBlur, thresholding and then dilation-erosion with different-sized elliptic kernels and threshold again. Then we have repeated these layers with different parameters.

3) Jitter

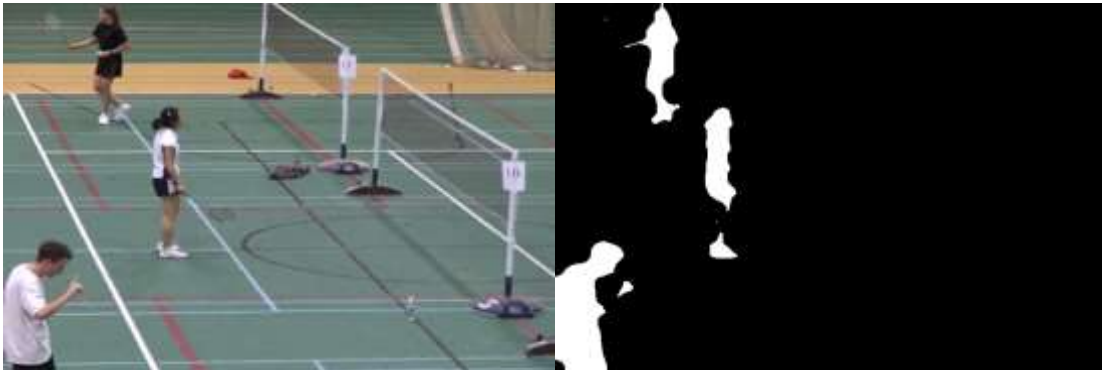


Figure 3: Input and output of a frame

KNN Background with higher no of history frames than baseline is used to generate the foreground mask, which has a lot of noise. Then the output image is thresholded to 0. The image had lots of noise, hence we used Gaussian Blur which gave best results at kernel size 21.

Then we used the morphological closing operation with an elliptic kernel of size 11 x 11.

Then finally erosion to make the masks slimmer.

4) Dynamic



Figure 4: Input and output of a frame

KNN Background with higher than baseline but lower than Jitter history frames is used to generate the foreground mask, which has a lot of noise. Then the output image is thresholded to 0. The image had lots of noise, hence we used Gaussian Blur which gave best results at kernel size 13. Then we used the morphological closing operation with an elliptic kernel of size 11 x 11. Then finally erosion to make the masks slimmer.