Moving Object Detection Using Deep CNN and LSTM

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Outline

1) Uploaded dataset to cluster, significant image processing: Images have varying sizes, are large and must sliced into smaller 512 x 512 pieces

2) Fixed Gaussian kernel for heatmap

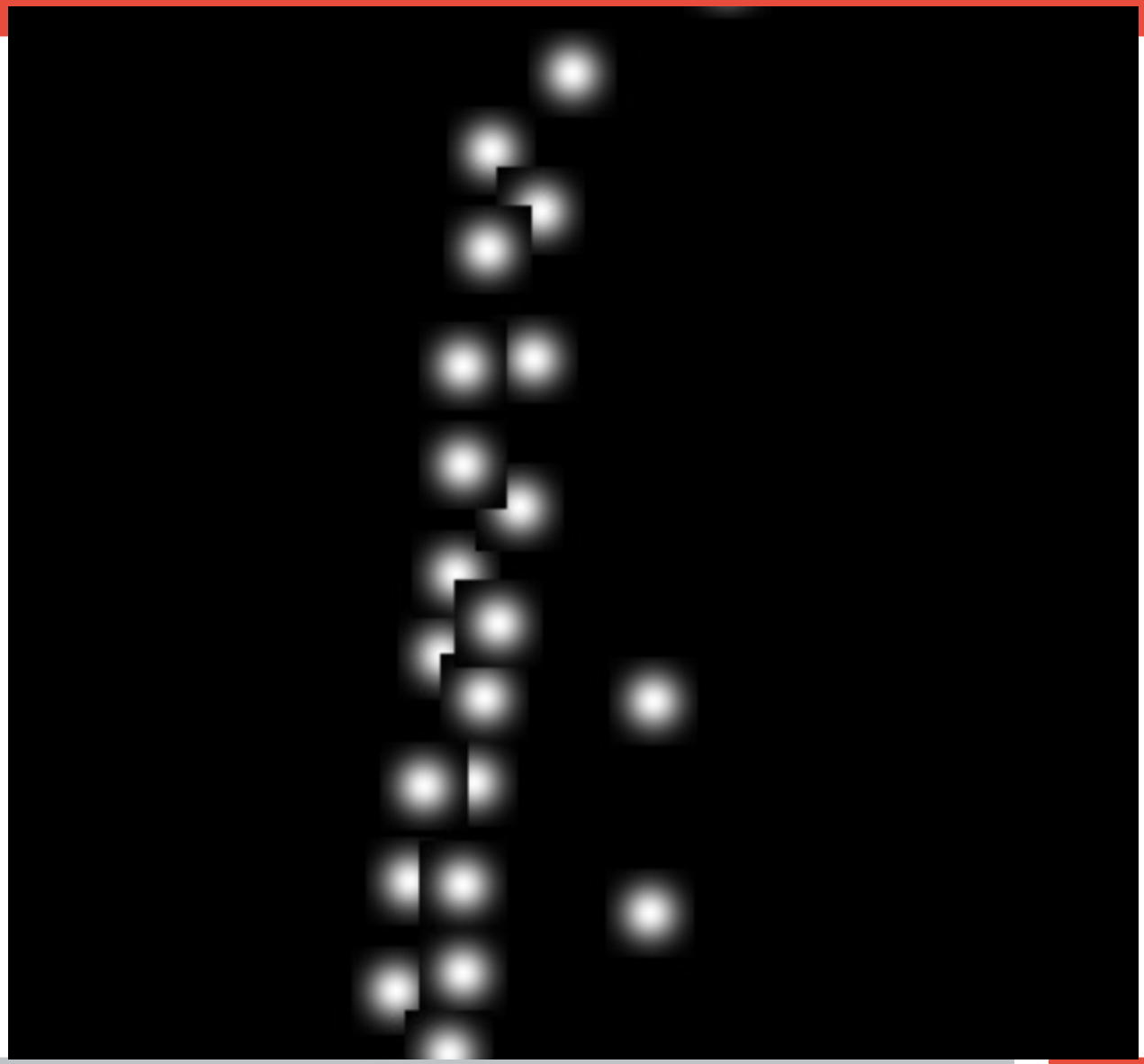
3) Continued working on 2D CNN, achieved loss of 0.0016

Gaussian Kernel

1) Determined optimal size for 2D Gaussian kernel in heatmap: ~25 x 25 pixels. This seems to completely capture most vehicles in the image.

2) Initially, the kernel was too small, and intensity values were too low





Results of 2D CNN

Achieved a loss of 0.0016 using 10 images and 1 epoch per image with a 25 x 25 Gaussian kernel heatmap.

Loss function is mean squared error, and using stochastic gradient descent.

```
Train on 2784 samples, validate on 697 samples
Epoch 1/1
2784/2784 [==============================] - 447s - loss: 0.0162 - val_loss: 0.0049
('Test score:', 0.0049124560004883211)
```

```
Train on 2784 samples, validate on 697 samples
Epoch 1/1
2784/2784 [==============================] - 446s - loss: 0.0016 - val_loss: 0.0015
('Test score:', 0.0015261600502543525)
```

Next Week

Work on visualizing results of network to make sure that it is working as intended.