Self Driving - Lane Detection
Report

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Dataset : CULane Dataset (xingangpan.github.io
Model Used : Auto Encoders
Original Input Image Size: 560x1640
Original Output Type: Text Files containing x,y coordinates of the lanes in that image.
Model Trained: 3 times

Pre Processing:

- Data loaded from tarfiles
- Images are resized to 168x492
- Images are normalized
- Labels are extracted and used to draw lanes onto an np.zeros array of the same shape as input.
- Output defined as Binary Images..

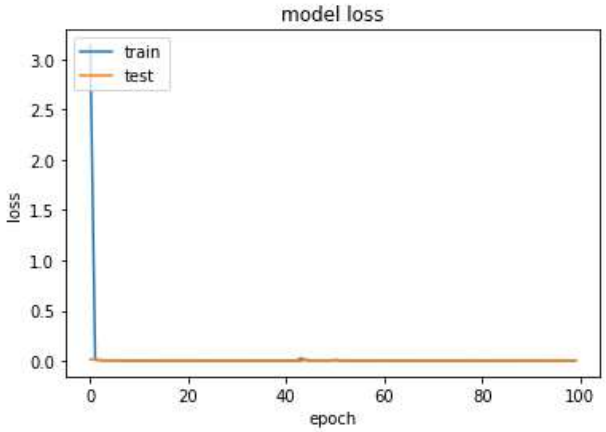
Model Architecture:

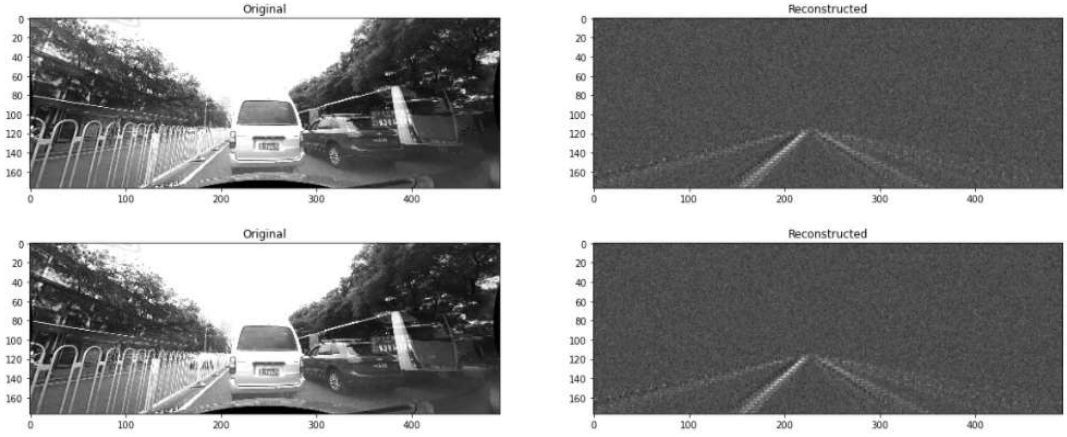
- **Library : TensorFlow**
- **Encoder** : Sequential
    1. InputLayer(168x492)
    2. Flatten()
    3. Dense(492)
- **Decoder** : Sequential
    1. InputLayer(492)
    2. Flatten()
    3. Dense(168x492)

Model Train 1

- **X_train :** 2000 2D images
- **y_train :** 2000 binary images
- **X_test :** 400 2D images
- **y_test** : 400 binary images
- **epochs :** 100

“
```
Epoch 99/100
63/63 [==============================] - 46s 738ms/step - loss: 0.0036 -
val_loss: 0.0036
Epoch 100/100
63/63 [==============================] - 46s 726ms/step - loss: 0.0031 -
val_loss: 0.0045
```
”





Model Train 2 - weights loaded from previous model

- **X_train :** 2000 2D images
- **y_train :** 2000 binary images
- **X_test :** 400 2D images
- **y_test** : 400 binary images
- **epochs :** 100

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```
Epoch 99/100
63/63 [==============================] - 50s 788ms/step - loss: 0.0012 - val_loss: 0.0028
Epoch 100/100
63/63 [==============================] - 47s 741ms/step - loss: 9.4245e-04 - val_loss:
0.0032
```
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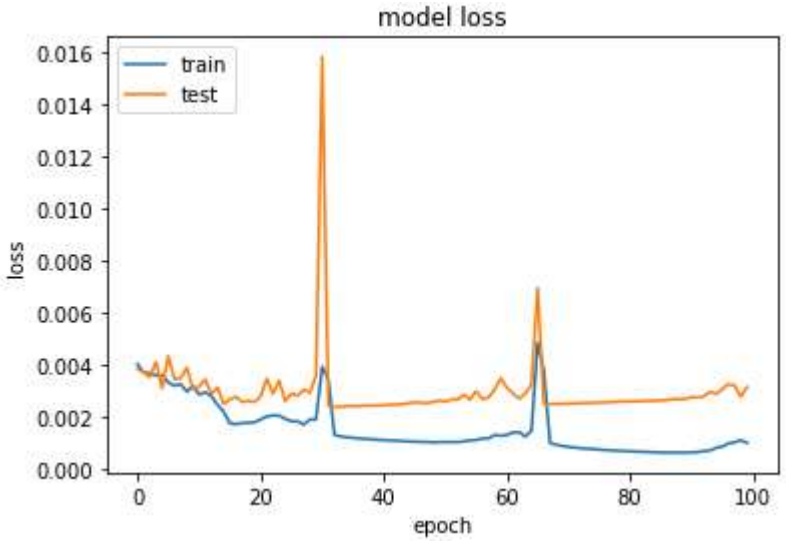

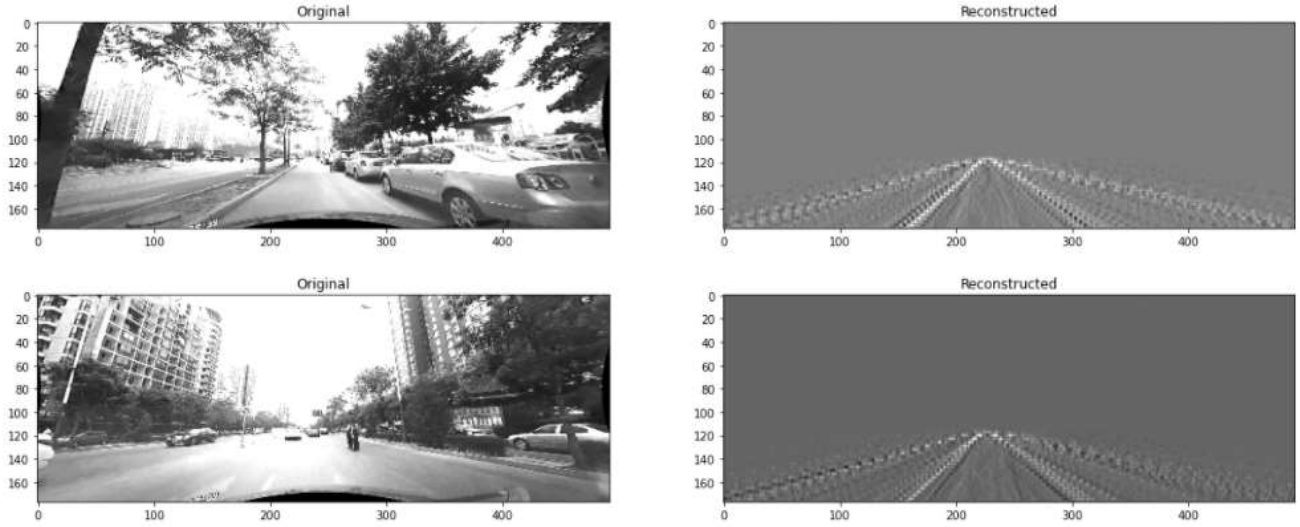

Model Train 3 - weights loaded from previous model

- **X_train :** 400 2D images
- **y_train :** 400 binary images
- **X_test :** 380 2D images
- **y_test** : 380 binary images
- epochs : 150

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```
Epoch 149/200
13/13 [==============================] - 11s 878ms/step - loss: 2.0938e-04 -
val_loss: 0.0018
Epoch 150/200
13/13 [==============================] - 11s 889ms/step - loss: 1.4825e-04 -
val_loss: 0.0018
```
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