My project goes according to the following,

Data Collection:

I used the provided sample driving data as my data source.

Preprocessing:

To prepare the images I do this:

1- Crop the image to filter out un-wanted areas
2- Resize images to (66,200) to match NVidia network input size.
3- Augment the data by flipping about 50% of left and right images.
4- Remove about 75% of low steering angles (lower than 0.05)

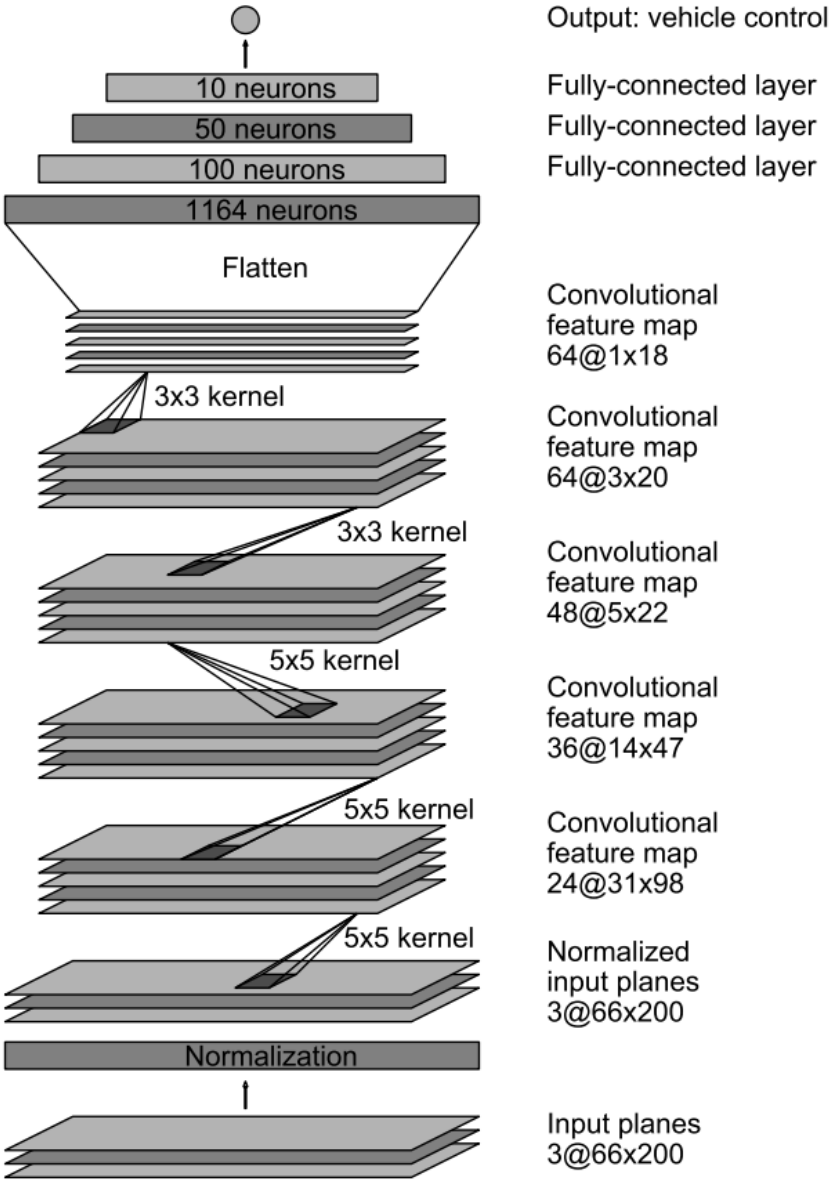
Model Architecture:

I used the recommended Nvidia model in this paper the model architecture is shown in the figure.

I fed the data folder images to the network through the generator that picks random batch from the images.

It picks an image (left, center, right) and flip it randomly about 50% of the time, then yields the batch and feeds it to the network until the whole dataset is used.

To avoid overfitting, I added some dropout layers of (0.15).



Model Training:

Then started trainning many times with different parameters till I reached the current parameters, patch size of 32, epochs number of 5 with Adam optimizer

Result:

A video of the result can be found in this link:
https://drive.google.com/file/d/1KwcF9UhXt3Vg3p3K8EdjPXKpAjBQS0G0/view

Model Architecture (summary output):

```
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
lambda_3 (Lambda)            (None, 66, 200, 3)        0
_________________________________________________________________
lambda_4 (Lambda)            (None, 66, 200, 3)        0
_________________________________________________________________
conv2d_6 (Conv2D)            (None, 33, 100, 24)       1824
_________________________________________________________________
spatial_dropout2d_6 (Spatial (None, 33, 100, 24)       0
_________________________________________________________________
conv2d_7 (Conv2D)            (None, 17, 50, 36)        21636
_________________________________________________________________
spatial_dropout2d_7 (Spatial (None, 17, 50, 36)        0
_________________________________________________________________
conv2d_8 (Conv2D)            (None, 7, 23, 48)         43248
_________________________________________________________________
spatial_dropout2d_8 (Spatial (None, 7, 23, 48)         0
_________________________________________________________________
conv2d_9 (Conv2D)            (None, 5, 21, 64)         27712
_________________________________________________________________
spatial_dropout2d_9 (Spatial (None, 5, 21, 64)         0
_________________________________________________________________
conv2d_10 (Conv2D)           (None, 3, 19, 64)         36928
_________________________________________________________________
spatial_dropout2d_10 (Spatia (None, 3, 19, 64)         0
_________________________________________________________________
flatten_2 (Flatten)          (None, 3648)              0
_________________________________________________________________
dropout_3 (Dropout)          (None, 3648)              0
_________________________________________________________________
dense_5 (Dense)              (None, 100)               364900
_________________________________________________________________
dense_6 (Dense)              (None, 50)                5050
_________________________________________________________________
dense_7 (Dense)              (None, 10)                510
_________________________________________________________________
dropout_4 (Dropout)          (None, 10)                0
_________________________________________________________________
dense_8 (Dense)              (None, 1)                 11
=================================================================
Total params: 501,819
Trainable params: 501,819
Non-trainable params: 0
_________________________________________________________________
```