The submission includes:
model.py
model.h5
drive.py
run_v2.2_less.mp4
writeup_report.pdf

Model Architecture and Training Strategy

An appropriate model architecture has been employed

My module consists of a normalized layer,
Cropping layer with (75,25), (0,0))
follows up with convolutional neural layer 5*5 filter and 24 depths
follows up with convolutional neural layer 5*5 filter and 36 depths
follows up with convolutional neural layer 5*5 filter and 48 depths
follows up with convolutional neural layer 3*3 filter and 64 depths
follows up with convolutional neural layer 3*3 filter and 64 depths
follows up with dropout layer with 0.5 possibility
follows up with flatten layer
100, 50, 10, 1 full neural layers.
all layers with RELU activation.

Attempts to reduce overfitting in the model

I added a dropout layer to reduce overfitting in model and trained and validated with different test set.

Model parameter tuning

The model used an adam optimizer, so the learning rate was not tuned manually

Appropriate training data

I used the sample training data and my training data. And tried to flip the image to get more data.

Model Architecture and Training Strategy

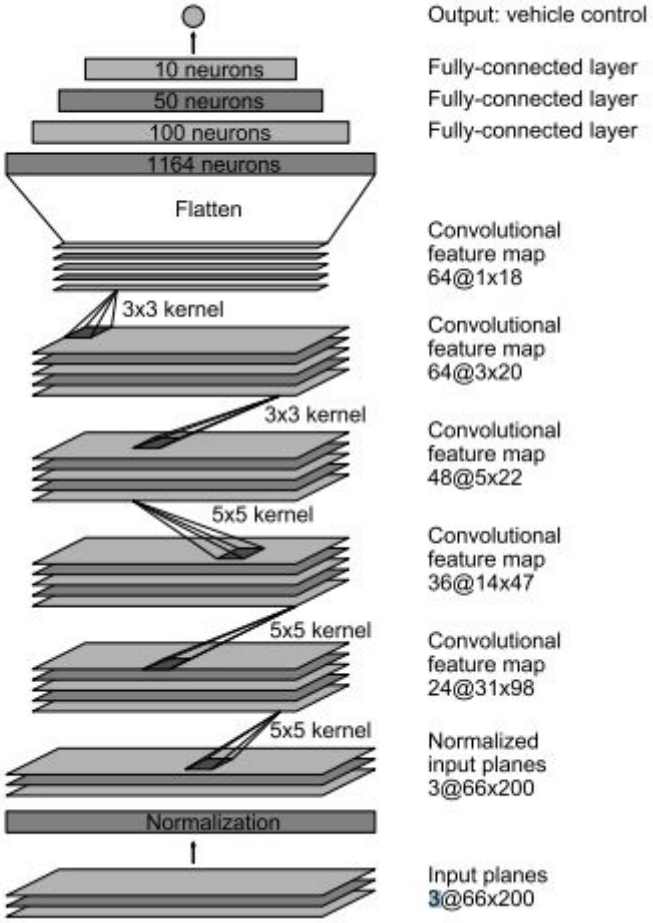
My first try is to use the previous test's sample version of convolutional neural layer just a

3*3 32 depths with a max pooling layer and use the sample training data.
The car drives bad with just training, it cannot even drive in the center of lane for 5 seconds. So I decide to collect more data by driving 2-3 laps data and drive counterclockwise. And with more training data, it made a little bit improvements by keeping in the lane for 10 seconds.

But still not good enough, so I realize the car usually drive off the lane and cannot turn back to the center of lane any more. So I intentionally collect more data by driving car back to the center, like this scenario.

After adding the off road training data, the car act much better than before. But cannot get through this point specifically:

So I try to use a new neural network as described above, which is same as the “End to End Learning for Self-Driving Cars”paper’s architecture.



After I use this new neural network, it finally can finish the full lap. But it doesn't turns perfectly at some road curves. I realize some of my training data is not perfectly driven with steering wheel left and right unstably. So I decide to remove some bad data from training set. Then I got my final version of driving at run_v2.2_less.mp4.