Things done:

1) Annotation of truck's license plate dataset.
2) Research and testing of potential models for recognition part.
3) Made an error correction algorithm for the prediction of the models.
4) Creating an ensemble model using shortlisted models.
5) Created an algorithm for segmentation of image for purpose of ANPR.
6) Creating a pipeline for taking license plate and outputting number plate.

Process in detail:

1) Annotation of truck's license plate:

   Use MyVision : http://192.168.5.12/

2) Research on potential models for recognition part:

   We started from basic model CRNN, you can find my implementation on ""

   CRNN was not that good and could not deal with irregular text.

   Moved forward to more advanced models which could even recognize curved text eg: MASTER, ASTER, SVR, AbiNet etc.

   Found an open source implementation (MMOCR) interface that allowed us to train and test these models in one place. Used it for testing and shortlisted SVR, SVTR-Base, NRTR models which gave very good result for our purposes.

3) Made an error correction algorithm for the prediction of the models:

   Made an algorithm that will correct the predicted number plate of the image. I made an map for character to list of characters in decreasing similarity eg: 5 -> [5,S,B,..]

   Then created a list of all valid state codes.

First iterated over the prediction after the state code and changed all I,O to 1,0 respectively as they are not suppose to appear there.

I applied a greedy algorithm for rectification of state code but iterating over the similarity table of the predicted state code till a valid state code in received. I idea is the using the most similar characters first we can get the correct state code most of the times.

I also applied similar idea to the areas where it was supposed to have number but we found character instead.

4) Creating an ensemble model using shortlisted models:

Passes the segmented input to the shortlisted models and pass it to error correction algorithm. The best of the corrected algorithm's output is given back.

5) Created an algorithm for segmentation of image for purpose of ANPR:

I made a copy of the license plate' image and resized it to (512,64). I then binarized the copy then normalized the image. I then made sum of the image's rows called sum_hor.

Based on the minimum value of the sum_hor around the middle region we make the following decision:

If min value in middle region is less than or equal to 3:
Then we have two lines in the number plate. Thus I save two images
Which will are cropped from original image (0:0.6*L and 0.4*L : -1)

Else:
We only have one line of text.

The cropped images are then saved.

6) Creating a pipeline for taking license plate and outputting number plate:

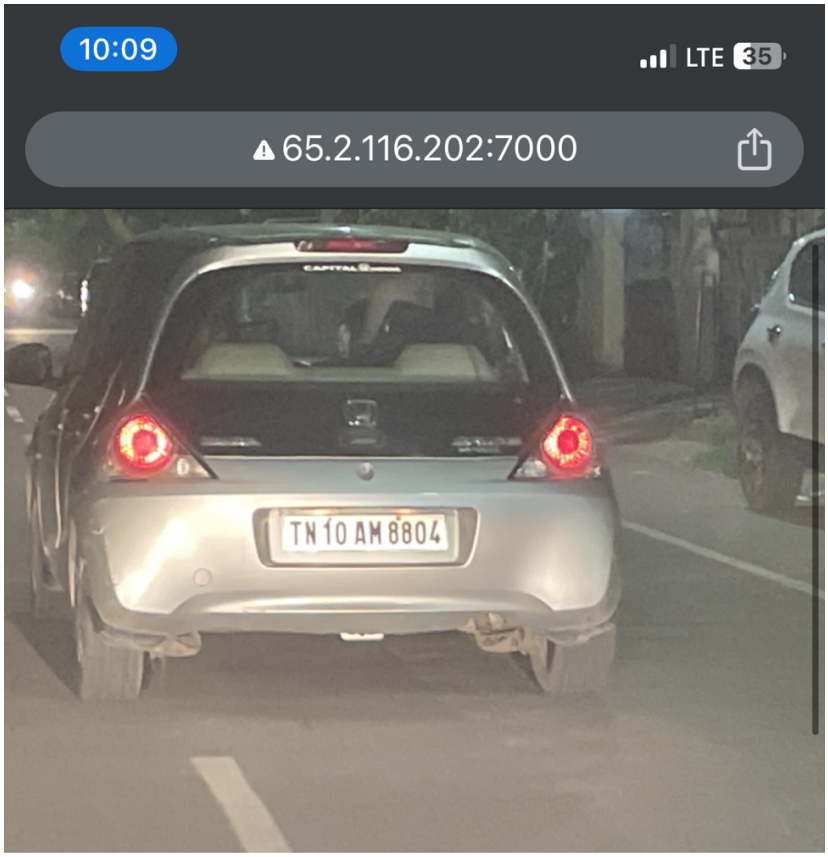
The pipeline is of the following flow:

Image of license plate -> model -> cleaning function(which has segmentation) -> the segmented images -> predictor -> predicted text ->error correction -> final output.

Final information:

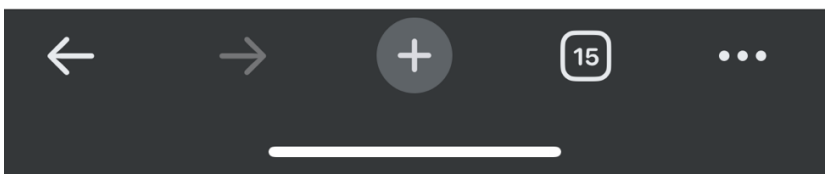
To install MMOCR follow the guide provided by them carefully, also it works best on Linux, on windows we may face problems like cuda version incompatible etc. On mac, we will face a lot of problems as there is no cuda support and many models require cuda (mps is not supported yet).

Results:



Your Vehicle Number is

TN10AM8804



9:59 LTE 38

65.2.116.202:7000

Automatic License Plate Number Recognition

Home / In

Your Vehicle Number is

TN09CR7049

9:57 LTE 39

65.2.116.202:7000

Your Vehicle Number is

TN09BY9801

8:03

LTE 53

65.2.116.202:7000

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Automatic License Plate Number Recognition

Your Vehicle Number is

TN09CR7160

7:58

LTE 54

65.2.116.202:7000

TamilNadu e Governance Agency
Automatic License Plate Number Recognition

Home / Index1

Your Vehicle Number is

TN22CV9382

7:54 LTE 57

65.2.116.202:7000

TamilNadu e Governance Agency

Automatic License Plate Number Recognition

Home / Index1

Your Vehicle Number is

TN01AW9135

9:54 LTE 40

65.2.116.202:7000

Your Vehicle Number is

TN09CL8074