A picture containing purple, pink, table

Description automatically generated

**Car Plate Recognition**

**Problem:** The dataset contains 433 images with bounding box annotations of the car license plates within the image to be trained using neural networks and one car image for number plate detection using OpenCV

**Task:** Our goal here is to build different model capable of locating licenses plate on new images. First model should be based on OpenCV techniques to detect the edge license plate from the “opencv\_car” image given below. Second model should include convolutional neural network (CNN) and any transfer Learning technique that will be train on “car\_cnn” data given below to detect license plate. Your model will be evaluated based on the following criteria:

1. Image Pre-processing Techniques (For Plate detection)
2. CNN Model Selection Criteria (Basis of choosing the final Technique)
3. Measurement Criteria (Comparison of Various Models)
4. Scope for improvement

**Expected Outputs:**

1. The Final code (Python or R) along with proper comments
2. A summary file (PDF format) stating:
3. Problem Statement
4. Approach Taken
5. Interpretation of Results
6. Minimal but effective Storyboarding - Consider the final audience of this will be the Business team. You need to bring the actionable insights in this section.

**How to Access the Data:** Please use the below drive link to download the Data. You can download ZIP format and then extract it. The annotation file is in XML format whereas car images is in png data. Also download the car image for OpenCV model.

[Cnn\_car.zip](https://drive.google.com/file/d/1xI0OVgQsQ_idgaNvlOxIUKb_5HBZsECB/view?usp=sharing)

[Opencv\_car.jpg](https://drive.google.com/file/d/1KIanvCO-jhS_HHT0LDKM1Jm-mjExYzHp/view?usp=sharing)

**Hints:**

1. Load the image using OpenCV and then apply Pre-processing techniques in order to find the contour (here, License Plate is to be detected).
2. Image pre-processing techniques you can apply – gaussian blur, thresholding, sober operation, canny edge and findcountor(must).
3. Variable X containing all the images of cars by resizing them and variable y containing all the bounding box annotations.
4. Compare CNN model with any one transfer learning model like VGG19, Resnet50 etc. for detecting plate from car image.

**Evaluation:** The project will be evaluated based on requirements and instructions provided above.