Machine Learning 2 Proposal
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Data Description:
We chose computer vision as the field we want to focus on. The dataset that we use is 'State Farm Distracted Driver Detection.' It is a Kaggle dataset which contains 19060 train images and 79726 test images. All of these data are driver images, each taken in a car with a driver doing something in the car. The behavior of drivers is divided into 10 classes.
The 10 classes to predict are:

- c0: safe driving
- c1: texting - right
- c2: talking on the phone - right
- c3: texting - left
- c4: talking on the phone - left
- c5: operating the radio
- c6: drinking
- c7: reaching behind
- c8: hair and makeup
- c9: talking to passenger

Problem Statement:
Our goal is to predict the likelihood of what the driver is doing in each picture. We choose this dataset because we think this is an applicable and meaningful project that can detect distracted driving behaviors and reduce the number of traffic accidents. Also, this competition finished many years ago, so we could try some state of the art models to see the performance of different models.

Models:
We decided to use some pre-trained computer vision models, which include VGG, Resnet, Alexnet, Inception, Densenet, and EfficientNet. Based on the performance, we will also consider adding more layers after pre-trained models. Most of these models used CNN but have different techniques.

Reference Material:
Since this is a kaggle competition， we read some discussions posted by participants who got higher rank. Most of them used VGG and Resnet, and then ensemble to get higher scores. Also, since our train set was given by certain order, we could compute some GIFs to see a series of drivers' movements.

Metrics:
The loss function we use is categorical cross-entropy, the training metric is accuracy. The evaluated metric for this competition is multiclass logarithmic loss.

Schedule:

Week1	Search background information, example codes, and configure environment

Week2	Debug the example code, combine code with some new techniques
Week3	Tuning models and parameters
Week4	Add data augmentation and ensemble