**Deep Learning Project Proposal**

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• What problem did you select and why did you select it?

The problem we selected for this project is voter turnout in American elections. There was a lot of speculation around voter turnout in 2020 with both high-profile candidates and new voting methods due to the pandemic. Furthermore, there is a long-standing interest in why many eligible voters decide not to vote. Turnout has been around 55-60 percent in most modern presidential elections, but rose to 67 percent in the highly salient 2020 presidential election, which was the highest turnout since 1900. However, that leaves around one-third of eligible voters still deciding not to cast a ballot. We want to explore reasons that they may not have voted.

• What database/dataset will you use? Is it large enough to train a deep network?

The dataset that we will use is sourced via Stanford University and a paper written by Jonathan Krause, Michael Stark, Jia Deng, and Li Fei-Fei titled *3D Object Representation for Fine-Grained Categorization*. It contains 16,185 images of 196 classes of cars and is split into 8,144 training images and 8,041 testing images with each class being split roughly 50-50 between the two subsets. Classes are typically at the level of *Make, Model, Year*, e.g. 2012 Tesla Model S or 2012 BMW M3 coupe. This dataset is large enough to train a deep network.

• What deep network will you use? Will it be a standard form of the network, or will you have to customize it?

We plan to use the <insert pretrained model name> while using our dataset to fine tune the model to allow for more precise classification of images of vehicles by *Make, Model, Year.* We will adjust the model if a need arises while testing the model.

• What framework will you use to implement the network? Why?

The framework we will use to implement the network is Tensorflow since the pretrained model is written using Tensorflow.

• What reference materials will you use to obtain sufficient background on applying the chosen network to the specific problem that you selected?

The reference materials we will use to obtain sufficient background on applying the chosen network to our vehicle image classification are the Deep Learning course materials, the official documentation websites for the packages we will be using, and various websites such as medium.com.

• How will you judge the performance of the network? What metrics will you use?

We will judge the performance of our models by checking the accuracy score of our test dataset. The metrics we will calculate are precision, recall, F1, and MSE for loss. We may use accuracy as a metric, dependent on how balanced the dataset is between classes. This will be examined during exploratory data analysis.

• Provide a rough schedule for completing the project

Our group plans to meet weekly on Tuesdays to discuss progress on the projects. The table below outlines the progress and deliverables that we plan to achieve at each date.

|  |  |
| --- | --- |
| Step | Target Date |
| Decide on dataset | 2021-11-03 |
| Gather data for model and upload it to cloud | 2021-11-09 |
| Build CNN model | 2021-11-16 |
| Optimize and finalize CNN model | 2021-11-23 |
| Draft of final report | 2021-11-27 |
| Finalize report | 2021-12-04 |
| Create and finalize presentation | 2021-12-05 |