CAPSTONE TERM 2 Group 14

Modeling 2

Project Title: Doodle Recognition System

Course Name: CAPSTONE TERM II

Course Code: 202041.23309-AIDI-2005-01

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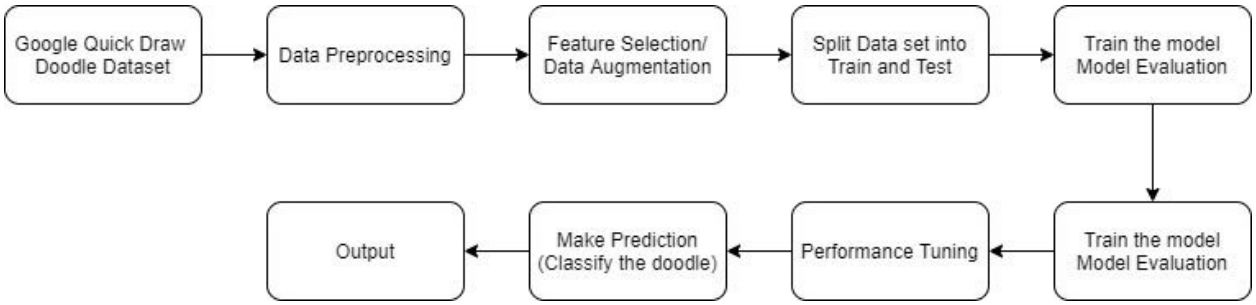
MODEL ARCHITECTURE AND SOFTWARE PIPELINE:

As this project involves recognition and classification of doodles, we will be using numerous data categories.



First, our dataset will be preprocessed, then we will apply feature selection, data augmentation and data cleansing techniques to make well understandable data for our model. Next, it will be segmented into two parts called test data and train data. After that, we will train different model algorithms to classify doodle images. Furthermore, performance tuning and model evaluation takes place in our pipeline. As this will reduce the chances of getting fatal errors. Lastly, the model will give the output as classify the category and recognize the image. This is the pipeline for the flow of data in our model.

DATA ASSUMPTIONS, LIMITATION & CONSTRAINTS:

The dataset that is going to be utilized for this application has numerous limitations and constraints as follows. The copious of the drawings that are a part of the dataset are not relevant to the category they are classified in. For example, there are random scribbles present which do not look like a bear if they are characterized under the bear category. These drawings remain ambiguous due to various reasons; such as the 20 second time constraint that is present, the presence of cultural differences in comprehending the words, etc. This limitation makes it difficult for the model to be able to classify the doodles accurately, leading to greater chances of misclassification. An inevitable constraint that this dataset arises from the method of its collection. It consists of the fact that each and every drawing is considered an input. As soon as the user begins to draw, the program intends to justify it in at least one of the 340 existing categories. Though this has provided a larger dataset to allow more inputs into the model for training purposes, on the contrary, it has also made the dataset noisier. A major limitation is the 340 categories and classes. Despite this appearing to be a large number, it limits the drawings in these boundaries, leaving no possibility of the correct classification. Regardless of the possibility

existing of a better category for a drawing input, the possibility of it not being an existing category increases the chances of misclassification, and accuracy is also lowered.

MODEL SELECTION SCORECARD:

We have used different types of machine learning algorithms and checked the accuracy of our model. Based on outputs from results of visualization, sensitivity and performance analysis of our model, we have given a score to each model and will later select the machine learning algorithm to proceed with.

Urls of Model Algorithms:

1. CNN:

https://github.com/karamjit-singh/four-doodle-dl/blob/master/four_doodle_cnn.ipynb

2. Random Forest:

https://github.com/karamjit-singh/four-doodle-dl/blob/master/QuickDraw_RF.ipynb

3. Mobile Net:

https://github.com/karamjit-singh/four-doodle-dl/blob/master/%F0%9F%90%98QUICK%20DRAW%20MobileNet-%20final.ipynb

Model	**Score**
CNN	92.20%
Random Forest	10%
Mobile Net	87%

References:

1. https://www.kaggle.com/harunshimanto/lets-play-with-quick-draw#%F0%9F%8F%9E-2.-Random-Forest
2. https://towardsdatascience.com/doodling-with-deep-learning-1b0e11b858aa
3. https://www.kaggle.com/huyenvyvy/fork-of-combining-cnn-and-rnn/notebook