Warehouse Storage Optimization - Report 7

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***Abstract*—This is the seventh progress report of our group *Gopher - Group 5* for Machine Learning (CSE523) course project.**

***Index Terms*—Time series forecasting, classification, hyper-parameter tuning**

I. Introduction

For our project, we decided to use the Amazon Bin Images Dataset.

This is originally a Computer Vision dataset. The Amazon Bin Image Dataset contains over 530,000 images and metadata from bins of a pod in an operating Amazon Fulfillment Center.

II. Brief insight of previous work

In previous week, we focused mainly on model training. We applied Decision tree, Linear Support Vector Classifier, K-Nearest Neighbours and Random Forest. We were able to obtain an accuracy of 84.23% in k-Nearest Neignbours with n_neighbours=5. We also figured out a issue in the dataset where when in case the object was not placed in the bin, the placed bin was showing a positive value instead of -1. We also performed Feature Engineering by plotting graphs of filled bins and products arriving. This gave us certain conclusion that there is no particular pattern in placement of products.

III. Task Performed And Outcomes

We spent this week exploring the crux of hyper-parameter tuning and how it can be implemented in classification algorithms. Initially, we tried looking up what hyper-parameter tuning actually is and how it is done in practical approach. We read various blogs who implemented hyper parameter tuning on their datasets which directed us using hyper parameter tuning techniques [1]

After that, we started looking for different frameworks that can be used for hyper-parameter optimisation.We went through frameworks like scikit-optimise, Ray-tune and Optuna.

IV. Tasks for Upcoming Week

The main tasks to be performed in the upcoming week are:

1) Tuning the hyper-parameters of the model
2) Exploring Optuna framework

References

[1] P. Gabrys, "How to make your model awesome with optuna," 2019.