Capstone Project Proposal

Title: Inventory Monitoring at Distributed Centers.

Domain Background:

Fulfillment Centers have bin locations for storing goods as it simplifies inventory management processes. Robots often move objects as part of their operations. Objects are carried to bin locations which can contain more than one object. Whole purpose of these bin locations is to organise the objects so they can be easily retrieved when searched.

Problem statement

One way to go around this problem is to count each object manually in the bin or another way might be to keep track of the count every time an object is removed or placed in the bin. However, a much simpler way of going about this problem might be to use a machine learning model that can count number of objects in each bin.

Datasets and Inputs:

Datasets which will be used for this project is Amazon Bin Image Dataset. This dataset contains around 500,000 images along with the metadata of images. Also, the metadata included in the dataset contains number of objects in the bin, its dimension, and the type of object. Link to the dataset https://registry.opendata.aws/amazon-bin-imagery/.

Solution statement:

Problem at hand can be solved using a pretrained deep neural network. Since we are dealing with image data, we can use convolutional neural network which can extract salient features from the images and use them for classifying images into different classes.

Benchmark model:

To solve the problem at hand, the model will be fine-tuned and adapted, as necessary. It will be tested on different models and the one which yields best accuracy will be selected. This process will ensure that the chosen model is robust.

Evaluation metrics:

Accuracy will be used as the evaluation metric for this problem.

Project design:

This project will be implemented on AWS Sagemaker. First, data will be downloaded from the link and uploaded to s3. Then, training will be done using script mode which will include all the necessary functions needed to run the training job and finally model will be test on test data.