Inventory Monitoring at Distribution Centers

Domain Background

Amazon Fulfillment Centers use robotic and computer vision technology to deliver millions of goods to customers in over 100 countries around the world. The Amazon Bin Image Dataset comprises photos and metadata from bins in an Amazon Fulfillment Center that is currently operational. The bin photos in this dataset were collected while robot units were transporting pods as part of typical Amazon Fulfillment Center operations.

Problem Statement

Each picture has a metadata file that contains information about the image such as the number of objects, the dimensions, and the kind of item. We will attempt to categorize the number of items in each bucket for this challenge. We will use a model to accomplish the categorization. We can utilize a pre-trained convolutional neural network or our own neural network design, and SageMaker to train our model.

Solution Statement

The solution would be to create a Deep Learning model that would assist in counting the items in each image by utilizing a pre-trained model.

Datasets and Inputs

The aft-vbi-pds S3 bucket in the us-east-1 AWS Region contains over 500,000 bin JPEG pictures and related JSON metadata files detailing things in the bin. The photos are in the bin-images directory, and the metadata for each image is in the metadata directory. Simple numerical unique IDs are shared by images and their related metadata. Amazon employs a random storage strategy in which things are placed into

accessible bins with sufficient space, resulting in the random contents of each bin rather than being arranged by specific product kinds. As a result, each bin picture may depict either a single type of goods or a varied selection of products. Items are occasionally misplaced while being handled, therefore the contents of some bin photos may differ from the documented inventory of that bin.

Benchmark model

I will compare my results with this person, he is using the same data set and he got 55.67 accuracy

https://github.com/silverbottlep/abid_challenge

Evaluation Metrics

The evaluating Metrics are the accuracy and the RMSE and they are 55.67 and 0.930 respectively from the comparison model.

Project Design

1-Upload Training Data(S3)

2-Model Training Script

3-Make a training job

4-Train in SageMaker

5-Hyperparameter tuning

6-deploying the model