

IKEA PRODUCT CLASSIFICATION REPORT

To perform classification, I have used a CNN. The model built is simple consisting of an input layer, 1 hidden layer and an output layer. Due to limitations of my systems hardware I had to limit myself from using a large dataset, and the number of epochs.

The dataset consists of nearly 400 images for each of the four categories i.e. bed, bottle, mat, table and are divided into train, test and validation datasets.

The dataset is augmented by random transformations so that the model doesn't see the same image in order to improve the model's ability to generalise. It can be seen that the training loss decreases and the validation accuracy increases as the number of epochs increase.

Another Technique for better classification

- I believe the above classification could be very much improved by increasing the dataset examples and enough preprocessing to establish ROI.
- Varying the learning rate parameter and working with other optimizers would give a good classification accuracy.
- Usage of regularizers could have as well improved the model.

Another approach would be to use a pre trained network as they would have learned features that are useful for CV problems. For example, if a model is built on a VGG16 architecture which is pretrained on the ImageNet dataset and if needed provide fine tuning which involve fine weight modifications.

Results:

A bottle image having the encoding 1 was tested by feeding it to the model and was correctly classified with an accuracy of 78%. It is quite evident from the confusion matrix that the mat has less classification accuracy due to less number of samples trained on compared to the others.