Advanced Machine Learning

Assignment 1

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Contents

1 About the datasetse

In the given datasets we have images consisting of hand gestures corresponding to the english sign language and images consisting of dressing items. The images are 28×28 in resolution.

2 Processing the dataset

The images were loaded from the corresponding csv file, where individual images are stored as rows, the columns being the pixel values. The images were then loaded as tensors and then normalised (we divided all pixel values by 266 to bring the values between 0 and 1).

3 Fully connected NN vs CNN

We designed, trained and compared the performance of 2 basic DNN and CNN architectures on both the datasets. However even though the architectures are simplistic, when comparing the performances of the 2 models on the datasets, it is evident that CNN's are the better fit for image data.

CNN's are far more able to capture the local patterns and the hierarchies in the images - which implies that they are able to extract better features from the images.

4 Comapring results

To compare results we trained both models for 10-30 epochs, and compared the results.

Model	Loss		Accuracy		Time/Epoch.
	Best	Last	Best	Last	
DNN	1.193	1.358	68.12	66.13	60s
CNN	0.786	1.363	80.73	79.48	61s
CNN with dropout	0.377	0.419	90.31	89.3	62s