CS347 Artificial Intelligence and Machine Learning

Face Recognition

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Face Recognition

Applications of face recognition:

- Government-issued identification processes
- Identity verification
- Attendance

Dataset

LFW - People (Face Recognition) dataset was used for this project. This has a folder for each person and inside that folder there are images of size (3, 250, 250) of that person.

We are preprocessing this data by resizing it's shape. Changing from RGB to greyscale is optional here which can be added in transforms.

We consider only those persons who have more than some threshold number of images and take their images randomly upto some max number of images.

Finally we create the train-ds and val-ds by train-test-split and Dataset class to create the loaders in train function.

Architecture

Architecture is created using the architecture.py file. It uses the layers defined as Layer1, Layer2 and Layer3 which is combined in some specific combition provided in the args.

This returns the architecture with saving the block diagram of the model in the modelname folder and then prints the summary which shows the individual layers in the model.

We also set the device as 'cuda' for fast training using GPU.

Training

We train the model created using the train-ds and creating a mini-batch loader on it. Also evaluate the loss and accuracies for both the datasets.

This also saves the model in the modelname folder after training to future predictions.

Finally we plot our losses and accuracies for training dataset and validation dataset and save this in modelname folder.

Results

We created three models which are in 3 folders model1, model2 and resnet152(transfer learning). Their validation accuracies are as follows:

- model1: 86.48
- model2: 84.69
- resnet152: 76.69

Drive Link: https://drive.google.com/drive/folders/1-aPyChSqxdMCGc7XiAHVerAVbGzh6ek3?usp=share_*ink*

References

Initial architecture reference:
https://github.com/syamkakarla98/Face$_R$ecognition$_U$sing$_C$onvolutional$_N$eura

https : *//www.kaggle.com/datasets/atulanandjha/lfwpeople*

Thank You