Assignment 4: Facial Manipulation Detection

Computer Vision — 0510-6251 — 2022-2023a

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# Introduction

# Build Faces Dataset

# Write an Abstract Trainer

## 3.1 Implement an Abstract Trainer

### Question 1:

Implemented

### Question 2:

After plot\_samples\_of\_faces\_dataset.py, we get this picture:A collage of two people

Description automatically generated with medium confidence

### Question 3:

Function train\_one\_epoch() Implemented.

The epoch has been implemented following the 6 steps:

1. zero the gradients

2. compute a forward pass

3. compute the loss w.r.t to the criterion

4. compute a backward pass

5. step optimizer

6. update the average loss and accuracy

This is the model

Diagram

Description automatically generated

### Question 4:

Function evaluate\_model\_on\_dataloader () Implemented.

For each batch:

1. compute a forward pass under a torch.no grad() context manager.

2. compute the loss w.r.t to the criterion

3. update the average loss and accuracy

### Question 5:

Run:

python train main.py -d fakes dataset -m SimpleNet –lr 0.001 -b 32 -e 5 -o Adam

### Question 6:

We see in the json created file a presentation of the network parameters, followed by prints of loss and accuracy for each epoch, and for train, validate and test dataset. It make sense to us, because it is very useful to track the history and behavior of the network, and of course, to display it easily in next question

### Question 7:

Run

Chart, line chart

Description automatically generatedChart, line chart

Description automatically generatedpython plot accuracy and loss.py -m SimpleNet -j out-/fakes dataset SimpleNet Adam.json -d fakes dataset

On the graph accuracy vs epoch, we can see the train curve converging relatively fast (for only 5 epochs!) to quite good accuracy (90 after 3 epochs). It can also indicate that the network is very good, or, that the data set of fakes\_dataset are “very bad”, and it is easy for the model to detect the false. The train and validation curves show less accuracy, but quite constant through the epoch which indicate a good reliability of the network and that it is not overfitted.

On the graph of loss vs epoch, the curve of train is decreasing, it shows a good progress to reduce the error of wrong detection. The curve of test is above the curve of val this time, and it makes sense because big loss means less accuracy.

### Question 8:

Highest validation accuracy : 90.2

Highest test accuracy : 87.5

It means that good correlation can be found between validation and test dataset. It also means that the network is well trained and is sufficient to difference between fake and real image for the images the “fakes\_dataset”.