

**Project Report**

**Rank: 17th**

**STUDENT NAME:** Rawan Ayman Mohamed Naguib Sadek

Alaa Ali Mohamed Mohamed

Hala Hatem Hussein Hafez

Ali Shaker

Diaa eldin Amr Ibrahim

Mina George

**COURSE NAME:** Neural Networks

**DEPARTMENT:** Artificial Intelligence

**COURSE CODE:** CSC 445

Models used: Resnet, CNN, MobileNet, Xception.

1-Xception:

1st Trial:

Hyper parameters:

* Choosing a small learning rate because of the small data size.
* In the beginning, all the classes had the same weights (1)

2nd Trial:

* No change in learning rate
* we adjusted them by raising the Tennis class to 1.5 as the prediction accuracy was low. Then, we raised the values of the other classes to avoid focus on one class only
* number of epochs = 15
* training accuracy was 96.1749 and Validation was 0.9436%

Graphical user interface

Description automatically generated

Loss Graph: We found that the loss is decreasing, and the Accuracy is increasing smoothly. There’s no large difference between the train and validation accuracy

Chart

Description automatically generated

Graphical user interface

Description automatically generated

Graphical user interface

Description automatically generated

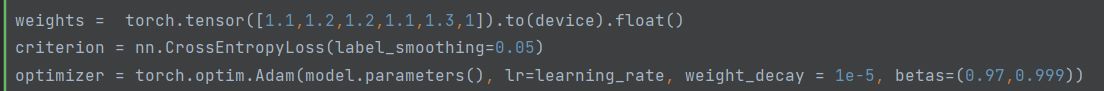
3rd Trial:

Augmentation: We increased the augmentation by Vertical and horizontal flip and rotation (-70,70)

Text

Description automatically generated

Weights: We decreased the weights of tennis to 1.3 and we changed the weight decay to 1e-5



We found that the validation accuracy increased to : 97.3294%

Graphical user interface

Description automatically generated

We found that the Training accuracy increased to : 99.7723%

A picture containing diagram

Description automatically generated

When we submitted on Kaggle accuracy was 91.5%

2- MobileNet:

1st Trial:

Hyper parameters:

* Choosing a small learning rate because of the small data size.
* In the beginning, all the classes had the same weights (1)

2nd Trial:

* No change in learning rate
* we adjusted them by raising the Tennis class to 1.5 as the prediction accuracy was low. Then, we raised the values of the other classes to avoid focus on one class only
* number of epochs = 15
* training accuracy was 97.5865% and Validation was 96.1424%
* Loss Graph: We found that the loss is decreasing, and the Accuracy is increasing smoothly. There’s no large difference between the train and validation accuracy

Chart

Description automatically generated

We tried to increase the predictions the next timeA picture containing graphical user interface

Description automatically generated

Chart

Description automatically generated with medium confidence

3rd Trial:

Augmentation: We increased the augmentation by Vertical and horizontal flip and rotation (-70,70) for every 20 pictures.

Number of epochs:20

Learning rate=9e-5

Val\_ACC: 98.8131%

T\_ACC: 99.6812%

Text

Description automatically generated



Chart

Description automatically generated

Confusion Matrices after adjustment:

A picture containing graphical user interface

Description automatically generated

A picture containing chart

Description automatically generated

Final Accuracies: 