Artificial Neural Networks and Deep Learning
Homework 1

Nicola Dean
10617541
nicola.dean
@mail.polimi.it

Marco Fasanella
10617541
marco.fasanella
@mail.polimi.it

Raffaello Fornasiere
10617541
raffaello.fornasiere
@mail.polimi.it

Christian Spano
10617541
christian.spano
@mail.polimi.it

1   Introduction

TUTTE LE TECNICHE USATE come abbiamo pensato di approcciare. Idee e risultati Timeline di quello fatto. Riassiunto delle metodologie e delle CNN

1.1   Classic Net

2   Dataset Helper and Model Helper

Spiegazione delle due classi: lista delle funzioni e automatizzazione

3   First try: vanilla network

-IMG della rete (dal lab) (magari orizzontale) risultati considerazioni

3.1   Batch Normalization

A first attempt was adding a Batch Normalization + Relu Activation Layer before our Pooling layers. This lead to poor result due to the fact that the network was too small.

3.2   Our homemade CNN

— RAFFAELLO—

3.3   Considerations

Best result consideration and observations

4   Transfer Learning and Fine Tuning

transfer leraning e modelli usati

4.1   Approach: Freezing Layers

Idea sulla freezing

4.2   VGG19

–MARCO– Spiegazione modell + prove fatte

4.2.1   Results

Both LaTeX and MS Word templates may be downloaded by visiting the conference website:

github.com/SDSS2020/SDSS-templates

Margins should not be altered from those used in the template files.

4.3   VGG16

–CHRISTIAN– Spiegazione modell + prove fatte

Freezed Layers	Accuracy	Precision	Recall	F1
8	0.8169	0.7989	0.7651	0.763
9	0.8225	0.8181	0.7682	0.7776
10	0.8338	0.8161	0.7929	0.8001
11	0.7577	0.7109	0.715	0.7048
12	0.7944	0.766	0.7504	0.7489
13	0.8028	0.7806	0.754	0.7596

Table 1: Results with Transfer Learning and Number of freezed layers for VGG19.
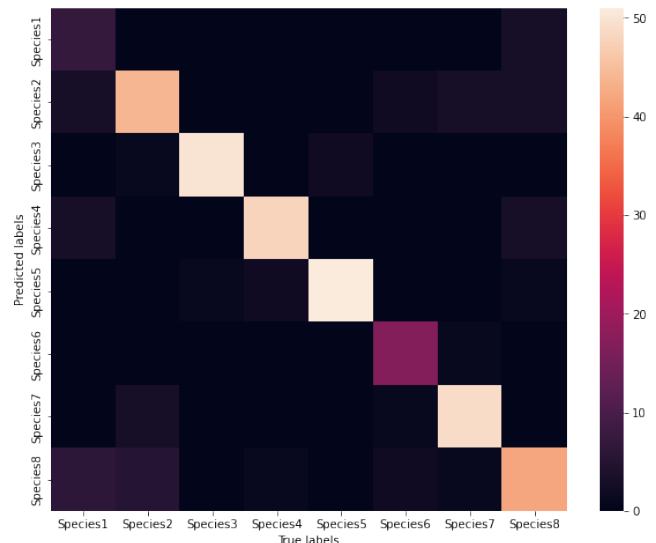

Figure 1: Confusion Matrix of best configuration with VGG19.

4.3.1   Results

4.4   Xception

4.5   Other Models

4.5.1   Resnet

4.5.2   GoogleNet

4.6   EfficientNet

5   Ensemble

Approccio provato a mischiare modelli c'era bias perchè avevano seed diversi

5.0.1 Results

6 If we had more time..

con più tempo cosa avremmo provato

7 Our Submissions

Description	Result
a	0.8169
b	0.8225

Table 2: Results with Transfer Learning and Number of freezed layers for VGG19.

8 Conclusions

Considerazioni finali e best model fattoo