Artificial Neural Networks and Deep Learning
Homework 1

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1 Introduction

–NICOLA–

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

–CHRISTIAN– 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

4.3 VGG16

–CHRISTIAN– Spiegazione modell + prove fatte

4.3.1 Results

4.4 Xception

4.5 Other Models

4.5.1 Resnet

–NICOLA–

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.

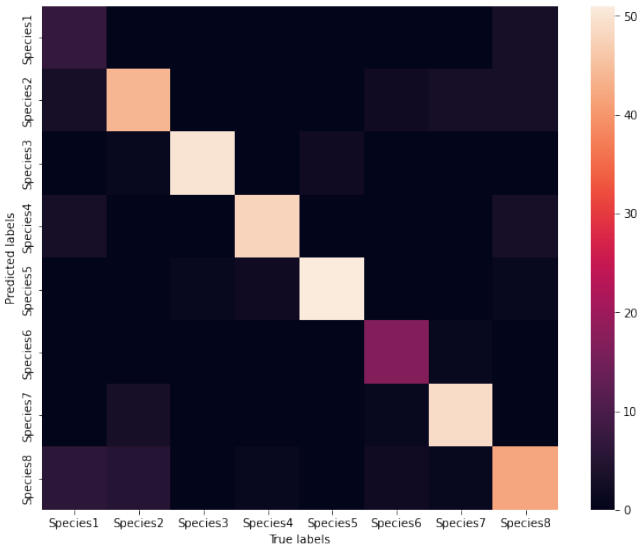

Figure 1: Confusion Matrix of best configuration with VGG19.

4.5.2 GoogleNet

4.6 EfficientNet

–NICOLA–

5 Ensemble

–NICOLA– 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