

LAB 6 - REFLECTIONS ON TRANSFER LEARNING

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1. FINETUNING

In pre-trained ResNet50 model, the weights are usually freezed, so that the model learns the new weights from the current model and then unfreeze the last layer weights. If this is not done then the learning rate might increase which in turn lead to overfitting.

For training, model 1 uses 2 convolution layer, 3 Fully connected Layer and ReLU as the activation function for 10 epochs.

A snapshot of the Metric Classification report of Model 1 is given as follows:

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	precision	recall	f1-score	support
Alilaguna	0.50	0.47	0.49	19
Ambulanza	0.60	0.41	0.49	22
Barchino	0.56	0.10	0.17	51
Gondola	0.00	0.00	0.00	3
Lanciafino10m	0.00	0.00	0.00	7
Motobarca	0.13	0.03	0.05	59
Motopontonerettangolare	0.00	0.00	0.00	3
MotoscafoACTV	0.00	0.00	0.00	1
Mototopo	0.60	0.88	0.72	274
Patanella	0.36	0.50	0.42	74
Polizia	0.00	0.00	0.00	15
Raccoltarifiuti	0.82	0.47	0.60	19
Sandoloaremi	0.00	0.00	0.00	3
Topa	0.00	0.00	0.00	29
VaporettoACTV	0.96	0.99	0.97	325
Water	0.94	0.92	0.93	420
accuracy			0.77	1324
macro avg	0.34	0.30	0.30	1324
weighted avg	0.73	0.77	0.74	1324

Fig. 1. Metric Classification of Model 1

From Figure 1, we can observe that even though it took long running hours the classification for few classes were not appropriate and they turned out to be 0. Hence, this might not be a good model to fully rely on for feature extraction.

2. REFLECT ON THE TWO DIFFERENT APPROACHES

To train CNN for the ResNet50, we have used the in-built function of Support Vector Machine (SVM).

From Figure 2, it is evident that though the classification is not done properly, the accuracy is comparatively better than the last model.

A snapshot of the Metric Classification report for Model 2 is given as follows:

	precision	recall	f1-score	support
Alilaguna	0.90	1.00	0.95	19
Ambulanza	0.82	0.82	0.82	22
Barchino	0.76	0.25	0.38	51
Gondola	1.00	0.67	0.80	3
Lanciafino10m	0.00	0.00	0.00	7
Motobarca	0.82	0.31	0.44	59
Motopontonerettangolare	1.00	1.00	1.00	3
MotoscafoACTV	0.00	0.00	0.00	1
Mototopo	0.82	0.99	0.89	274
Patanella	0.41	0.84	0.55	74
Polizia	0.67	0.13	0.22	15
Raccoltarifiuti	1.00	0.74	0.85	19
Sandoloaremi	0.00	0.00	0.00	3
Topa	0.00	0.00	0.00	29
VaporettoACTV	0.99	1.00	1.00	325
Water	0.99	0.97	0.98	420
accuracy			0.87	1324
macro avg	0.64	0.54	0.56	1324
weighted avg	0.87	0.87	0.85	1324

Fig. 2. Metric Classification of Model 2

Also, Model 2 took less training time as compared it to Model 1.