Report :: TIPR Assignment - II

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4th March 2019

Part 1:

Task 1:

Number of hidden layers were varied from 1 to 12 with each layer containing 100 units and relu activation. Adam optimizer was used with cross entropy loss function.

A train test split was done at 0.33 and the following plots were obtained by evaluating the different metrics on the test set.

As there is a clear jump in the metric at 5 hidden layers model, the number of hidden layers was fixed to be 5.

Part 1:
Task 2:
With the number of hidden layers fixed, the number of neurons in each hidden layer was varied is the following fashion:
32, 64, 100, 128, 256, 512, 1028

The accuracy for 64 and 100 units was the highest and almost equal, so 64 units were fixed for each hidden layer.

Part 1:
Task 3:
Now the fixed model was varied against different activation functions, The plots are shown below:

The final model was implemented in keras:

Layer (type)	Output Shape	Param #
dense_14 (Dense)	(None, 64)	50240
activation_13 (Activation)	(None, 64)	0
dense_15 (Dense)	(None, 64)	4160
activation_14 (Activation)	(None, 64)	0
dense_16 (Dense)	(None, 64)	4160
activation_15 (Activation)	(None, 64)	0
dense_17 (Dense)	(None, 64)	4160
activation_16 (Activation)	(None, 64)	0
dense_18 (Dense)	(None, 64)	4160
activation_17 (Activation)	(None, 64)	0
dense_19 (Dense)	(None, 10)	650
activation_18 (Activation)	(None, 10)	0

Total params: 67,530
Trainable params: 67,530
Non-trainable params: 0

Part 2:
Task 1:
Again the number of hidden layers were varied from 1 to 12. The images were downsized to .25 of the original. So the input layer had 2500 neurons.
Different combinations of neurons were tried ie expansion the contraction , bottleneck.
But the accuracy remained close to zero

Part 3
Dolphin dataset
Accuracy = 0.9047619047619048
F1micro = 0.9547511312217195
F1macro = 0.9500000000000001

Pubmed dataset:
Accuracy = 0.42066744730679156
F1micro = 0.31422423578337105
F1macro = 0.42066744730679156

TWitter dataset:
Accuracy = 0.5282828282828282
F1micro = 0.45928206398927546
F1macro = 0.5282828282828282

MLNN performs very well on the Dolphins dataset but not so well on the other two