Aprendizaje Profundo

Lab

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Content

Resume

- We process various runs of two Multilayer Perceptron (MLP) models and two runs of convolutional neural network (CNN) models
- Due to limited resources we only show runs of the different models, and not the complete search of models
- It is not always true that additional runs improve accuracy or reduce losses (it obeys to the stochastic nature of the process)

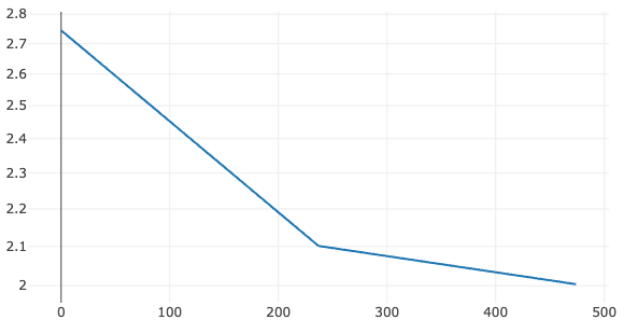
Source Type	Dropout	Train Loss	Validation	
			Accuracy (bacc)	Loss
MLP	0.025	2,0106	0,5738	1,9814
	0.025	2,004	0,575	1,975
	0.35	3,201	0,329	3,18
	0.35	3,201	0,329	3,1817
CNN	0.3		0,3461	5,61

Baseline MLP_1

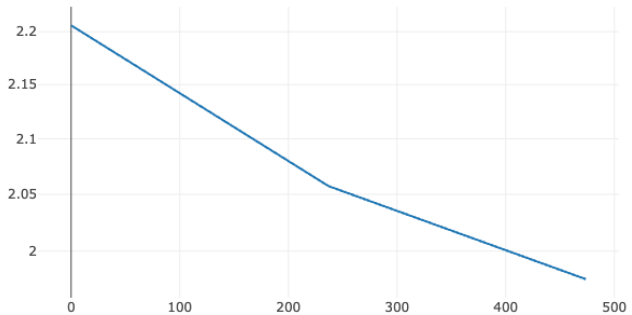
- The balanced accuracy metric, which take into account unbalanced data, shows a 57.6% accuracy (1st Modelo, MLP1) y 57.4% (2nd Model, MLP1a).
- The second model is less effective & efficient (higher loss & accuracy).

MLP_1

- Train Loss (logs)



Validation Loss (logs)



- MLFlow results

▾ Parameters

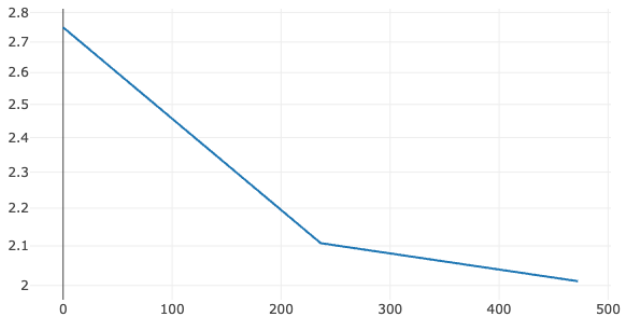
Name	Value
dropout	0.025
embeddings	./data/SBW-vectors-300-min5.txt.gz
embeddings_size	300
epochs	3
hidden_layers	[256, 128]
model_type	Multilayer Perceptron

▾ Metrics

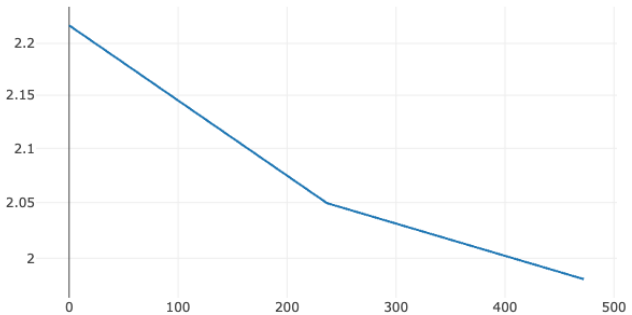
Name	Value
train_loss	2.004
validation_bacc	0.576
validation_loss	1.976

MLP$_1$ 2nd *round*

- Train Loss (logs)



Validation Loss (logs)



- MLFlow results

▾ Parameters

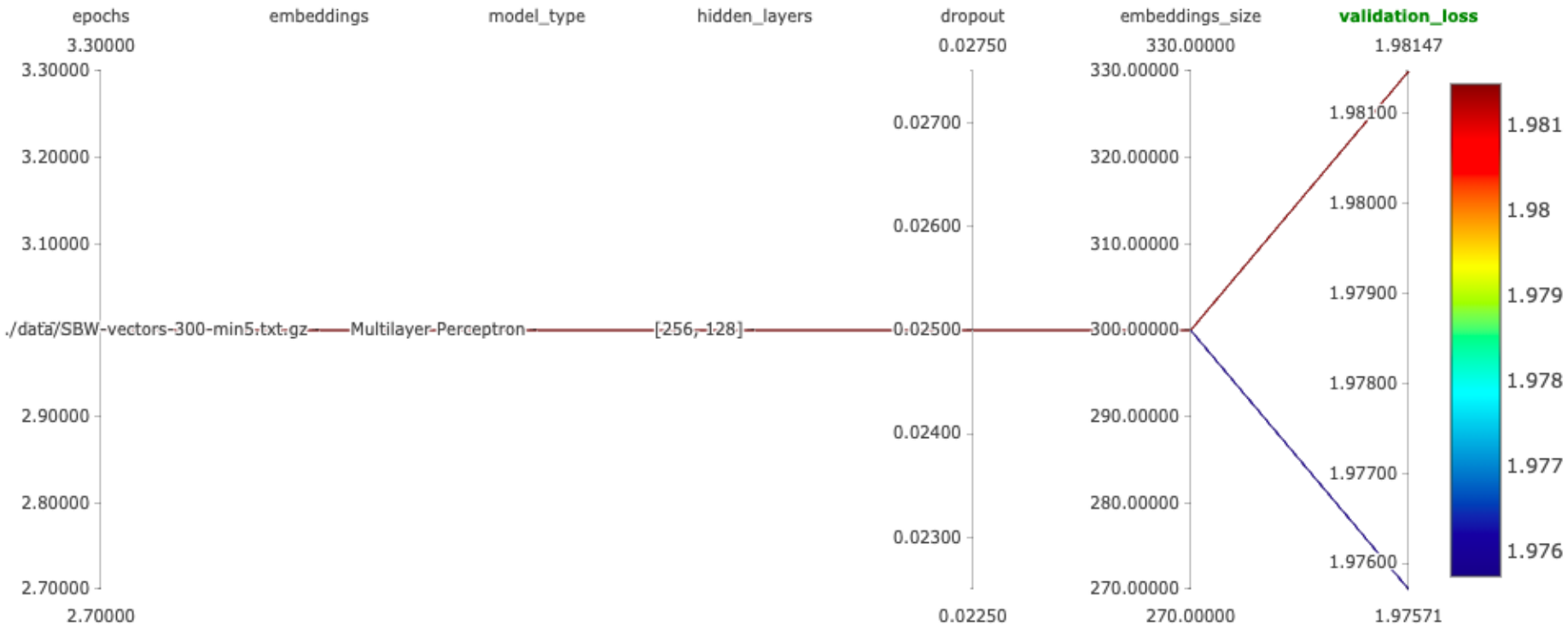
Name	Value
dropout	0.025
embeddings	./data/SBW-vectors-300-min5.txt.gz
embeddings_size	300
epochs	3
hidden_layers	[256, 128]
model_type	Multilayer Perceptron

▾ Metrics

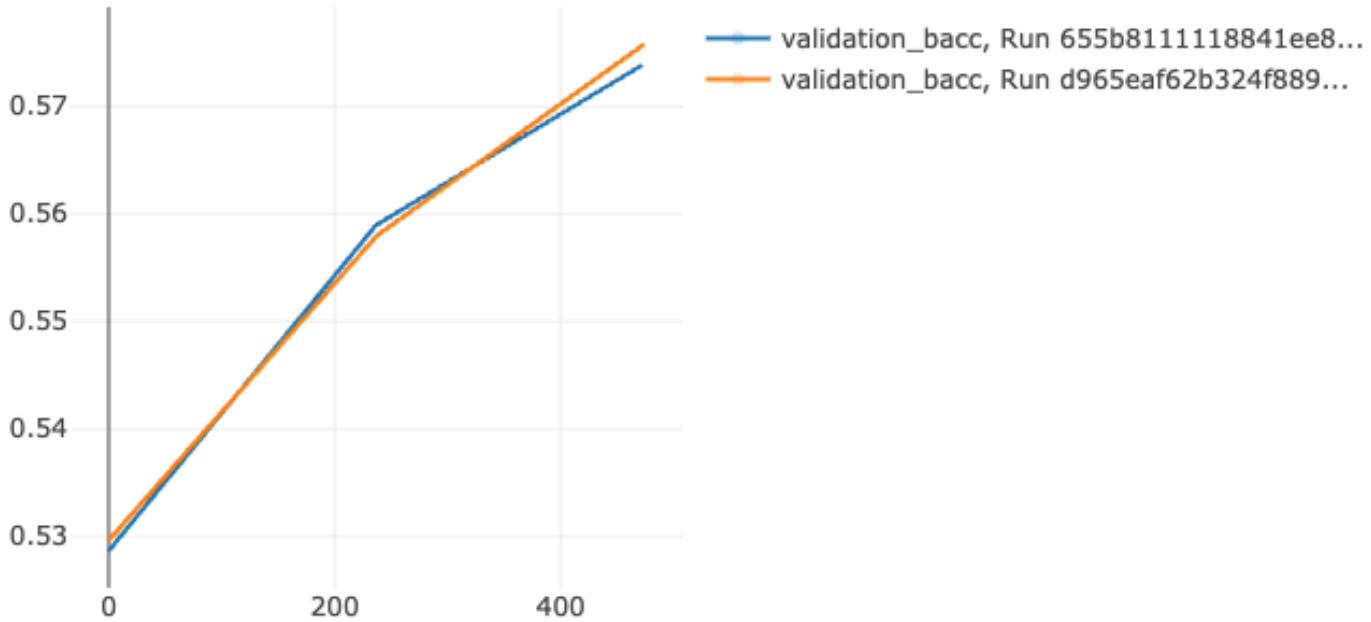
Name	Value
train_loss	2.011
validation_bacc	0.574
validation_loss	1.981

Benchmarking both MLP_1 *models*

Second round less effective & efficient



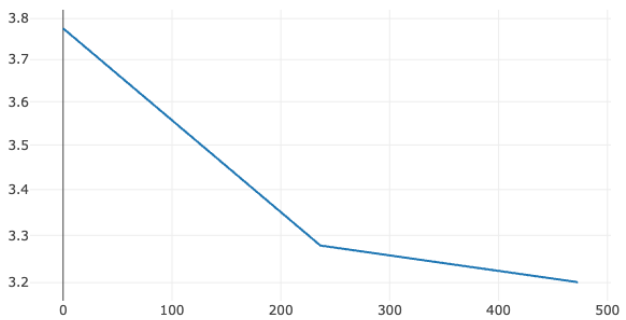
Validation BACC for both MLP_1 *models*



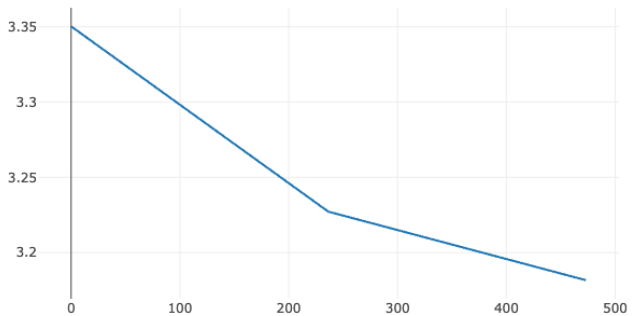
- Blue line refers to the 2^{nd} round model
- Although the comparative figure shows that the second round model is not always inefficient

Larger Dropout (from 0.025 to 0.35) MLP_2

- Train Loss (logs)



Validation Loss (logs)



- As expected, lower efficacy/ciency
- Additional rounds,better results,
- Does not assure it can be get better w.r.t models without dropouts
- MLFlow metrics

▼ Metrics

Name	Value
train_loss	3.201
validation_bacc	0.33
validation_loss	3.182

Comparative: First and Second round with high dropout

- More efficient second round, lower loss (train and validation) and slightly higher balanced accuracy

Metrics

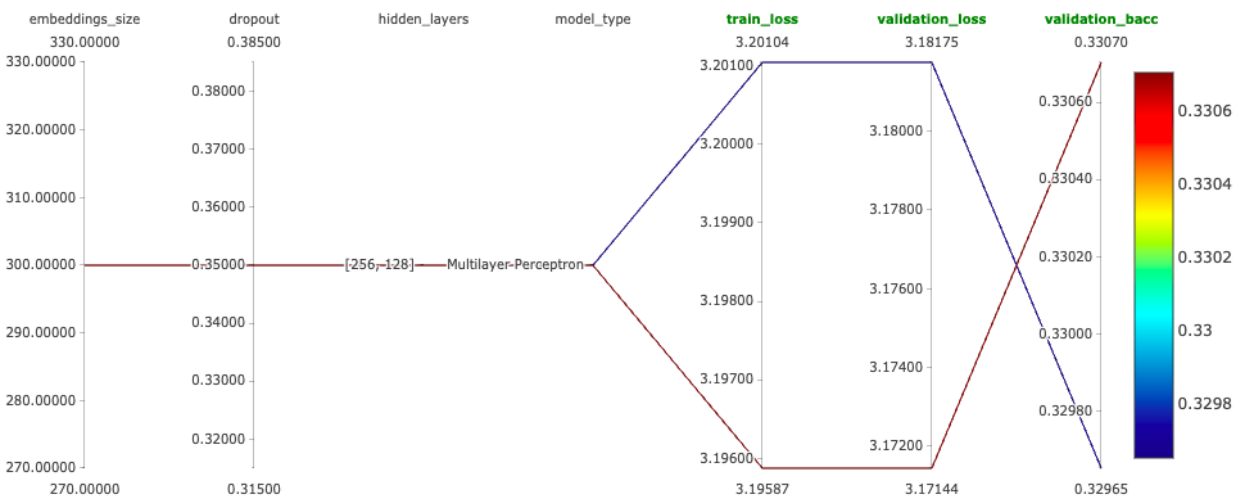
train_loss	3.196	3.201
validation_bacc	0.331	0.33
validation_loss	3.171	3.182

Scatter Plot | Contour Plot | Parallel Coordinates Plot

Parameters: embeddings_size × dropout × hidden_layers × model_type ×

Metrics: train_loss × validation_loss × validation_bacc ×

- train_loss
- validation_bacc
- validation_loss

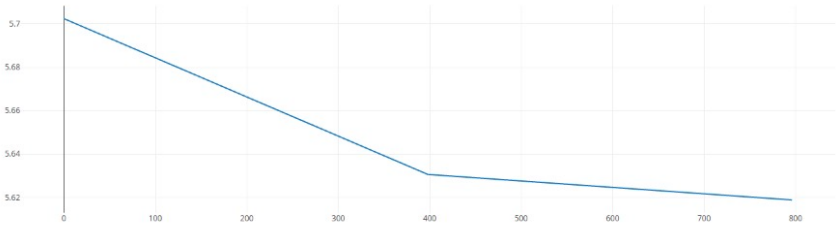


CNN

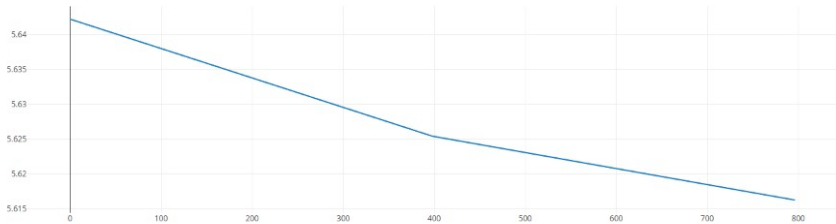
- We run various CNN models, but only one was finished
- The accuracy of this run was not much better than the ones of MLP
- The validation and train losses do not improve with CNN either

CNN_1

Train Loss



Validation Loss



MLFlow results

▼ Parameters

Name	Value
dropout	0.3
embeddings	./data/SBW-vectors-300-min5.txt.gz
embeddings_size	300
epochs	3
model_type	CNN

▼ Metrics

Name	Value
train_loss	5.619
validation_bacc	0.346
validation_loss	5.616

Unfinished (process killed before we got the better of it

- Accuracy and losses are worst than the finished CNN version, and, therefore, than of the MLP models previously presented

▾ Parameters

Name	Value
dropout	0.3
embeddings	./data/SBW-vectors-300-min5.txt.gz
embeddings_size	300
epochs	3
model_type	CNN

▾ Metrics

Name	Value
train_loss	5.702
validation_bacc	0.299
validation_loss	5.642

A lot of work to do

- The Lab, as well as the course, opens the mind to a new world
- Access to more resources could have improved our findings