Machine Learning & Pattern Recognition

SGN-41007

Course assignment (Kaggle competition)

Task #2 Report

Team #41

Christen Blom-Dahl Casanova
Ronal Bejarano
Deborah Shin
Seonghoon Wee

1. Models tested vs final model accuracies for LSTM RNN model trained with 25-30 epochs and batch size equal to 32 (Including L1 regularizer = 0.0001 for each layer)

Network Model	Validation accuracy (model.evaluate)
2 x LSTM (100, 300) + Dense (9)	74.7 %
2 x LSTM (512, 512) + Dense (9)	52.6 %
2 x LSTM (128, 64) + Dense (9)	76.8 %
2 x LSTM (100, 200) + Dense (90,45,9)	80,91 %
2 x LSTM (25, 25) + Dense (9)	80.57%

Dataset splitted using TimeSeriesSplit (train / validation).

2. Regularize the Network (Add a L1 regularizer to each layer an check the accuracy)

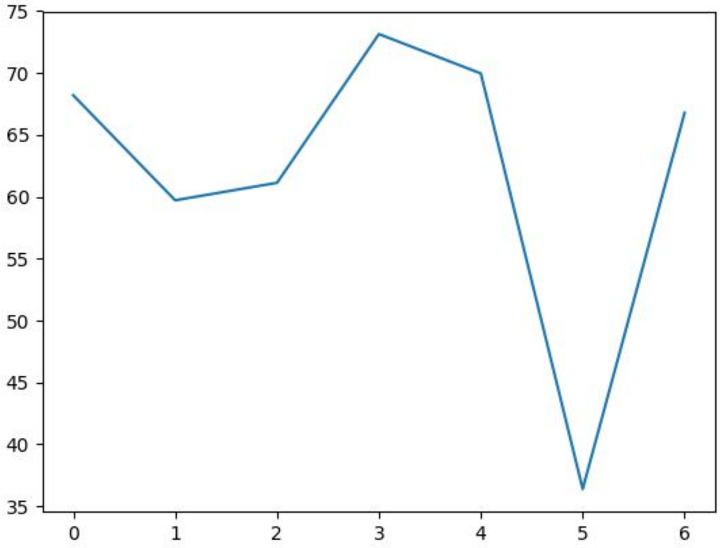

Figure 1. Accuracies verses values(indices) of L1 Regularizer.

For choosing the right L1 regularizer values, we tested 7 values: 0.1, 0.01, …. , 0.0000001(On the Figure 1 above, the horizontal axis are labeled as indices of 6 values on increasing order) on LSTM model with 10 epochs each. According to several compile results the label 3, 0.0001 was revealed to be the optimal value for the L1 regularizer.

Conclusions

1. Results of RNN models implemented using LSTM could not improve the results from last task (ASD).
2. Increasing the number of nodes improved stability of accuracy in between epochs, but could not increase the validation accuracy.
3. Some models trained on intermediate epochs showed better results during training.
4. Even different network models were used, it was not clear why the results could not improve. One hypothesis is the lack of training data, which might not be enough for a LSTM RNN.
5. Larger regularizer values than 0.0001 might have caused to much biasing, and the smaller ones might have too small influence to generalizing the data.
6. Previous data processing might help to improve the results.