Comparing Graph Neural Network Performances Against Standard Natural Language Techniques

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1 Introduction

For this mid-term report we have trained all the models (except the Graph Convolutional Neural Network) with a split of Train-Validation of 80%-20% and, we have reported Precision, Recall, F1-Score, Support and Accuracy for each model. Notice that, in the final report we are going to change also the train-validation split (70% - 30%) to have data also regarding that aspect as well. For time reasoning right now we have only collected those results.

2 Results

Here the list of tables with the values of **Precision**, **Recall**, **F1-Score**, **Support**, **Accuracy** depending on the split percentage of training and validation set.

- Train 80%, Validation 20% :

  - **Precision** :

Model	r8	oh	r52
Bagging	0.91	0.37	0.82
Boosting	0.92	0.43	0.84
Convolutional Neural Network (CNN)	0.95	0.36	0.82
Recurrent Convolutional Neural Network (RCNN)	0.80	0.14	0.64
Recurrent Neural Network (RNN)	0.90	0.24	0.75
Rocchio Classifier	0.84	0.38	0.80
Support Vector Machine (SVM)	0.92	0.43	0.84

  - **Recall** :

Model	r8	oh	r52
Bagging	0.91	0.39	0.83
Boosting	0.92	0.46	0.85
Convolutional Neural Network (CNN)	0.95	0.42	0.85
Recurrent Convolutional Neural Network (RCNN)	0.82	0.28	0.69
Recurrent Neural Network (RNN)	0.90	0.30	0.79
Rocchio Classifier	0.78	0.25	0.64
Support Vector Machine (SVM)	0.92	0.46	0.85

  - **F1-Score** :

Model	r8	oh	r52
Bagging	0.91	0.37	0.82
Boosting	0.92	0.42	0.83
Convolutional Neural Network (CNN)	0.95	0.36	0.83
Recurrent Convolutional Neural Network (RCNN)	0.81	0.17	0.65
Recurrent Neural Network (RNN)	0.90	0.23	0.76
Rocchio Classifier	0.80	0.27	0.70
Support Vector Machine (SVM)	0.92	0.42	0.83

  - **Support** :

Model	r8	oh	r52
Bagging	12277	11839	14559
Boosting	12277	11839	14559
Convolutional Neural Network (CNN)	12277	11839	14559
Recurrent Convolutional Neural Network (RCNN)	12277	11839	14559
Recurrent Neural Network (RNN)	12277	11839	14559
Rocchio Classifier	12277	11839	14559
Support Vector Machine (SVM)	12277	11839	14559

– **Accuracy** :

Model	r8	oh	r52
Bagging	0.91	0.39	0.83
Boosting	0.92	0.46	0.85
Convolutional Neural Network (CNN)	0.95	0.42	0.85
Recurrent Convolutional Neural Network (RCNN)	0.82	0.28	0.69
Recurrent Neural Network (RNN)	0.90	0.30	0.79
Rocchio Classifier	0.78	0.25	0.64
Support Vector Machine (SVM)	0.92	0.46	0.85