BiLSTM-Ridge Regression Meta Learning Model for Few-Shot Logs Classification

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Abstract—In the high threat attack classification detection task, it is hard to find attack logs in the huge log set because the number of attack logs in the log set is particularly small, which is a major difficulty in the high threat attack classification detection task. This paper proposes a Meta learning classification model based on few-shot samples. Aiming at the uneven distribution of samples in the data set. Firstly, processing the source data set and enhance the data set to build a data set that can meet the C-way k-shot, then using Fasttext to pre-train the data set samples, Finally, building a meta knowledge learner by using BiLSTM and support set meta training classifier by using ridge regression. The experimental results show that the proposed BiLSTM-Ridge regression model shows good results in the classification and detection of small sample attack logs on the real 335 attack log data sets of China Science and technology network. The accuracy of 5-way 3-shot can reach 66.47%, and the accuracy of 5-way 1-shot can reach 49.72%, which is improved compared with the typical small sample model.

Keyword—Few shot, Meta Learning, BiLSTM, Ridge Regression, High threat attack

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