

Concluding the severity of online harassment for specific groups can be difficult to pinpoint. A group of researchers from Daffodil International University found that during the COVID-19 pandemic, children in Bangladesh were disproportionately targeted with an extensive amount of online harassment. In their paper *Exploring Public Attitude Towards Children by Leveraging Emoji to Track Out Sentiment Using Distil-BERT a Fine-Tuned Model*, the researchers aimed to classify the negative comments children experience online through the use of deep learning models in order to reveal the risks that children face when using the internet. As multiple deep learning models have been incorporated through different methods of sentiment analysis, this paper also serves as an accuracy comparison between models within the described context. The utilized models include transformer-based models BERT and Distil-BERT, along with the glove word embedding based CNN and Fast-Text models. The BERT family model generates contextualized word embeddings by considering surrounding words, while glove word embedding takes into account occurrence statistics to create vector representations of words. Contextualized word embeddings enable words to take on different meanings when placed in separate contexts. Within the paper, diagrams are presented to explain the similarities between models from the BERT family. Distil-BERT branches from an already trained BERT model in an attempt to become more efficient while having similar performance, meaning Distil-BERT is trained to run faster. The paper showed that Distil-BERT achieved the highest accuracy among the models that were implemented, with Fast-Text and CNN both trailing behind BERT. The range of accuracy percentage was three percent. The authors concluded pre-trained models performed best and Distil-BERT's understood performance loss was not significant in this study, but it must be noted that their findings are specific to the datasets used. After concluding their findings, the implications of research methods were discussed. Data drawn from performing sentiment analysis on a vast amount of data for the safety of children's online usage can serve as evidence for the creation of child protection policies.

Within the Ukraine War Research project regarding the text analysis of twitter tweets, one goal of the project includes gathering larger datasets. The addition of larger datasets requires the necessary time to process performing text analysis. Distil-BERT was designed with the intention of producing results quicker than other models, but the accuracy of such a model on the twitter data was unknown. Distil-BERT's efficiency is due to its neural network being constructed with fewer layers and less training parameters. Part of the training from a Distil-BERT model pertains to attention distillation, which encompasses the technique of approximating the patterns of the larger BERT model. Imitating a larger model to produce similar results without processing the layers of the BERT model also leads to Distil-BERT's faster runtime. Comparing the current CardiffNLP's RoBERTa model used in the project to a Distil-BERT model fine-tuned on the Stanford Sentiment Treebank highlighted their differences. The Distil-BERT did not contain a

neutral sentiment, while the RoBERTa model did. Looking at a categorized comparison of confidence levels, the RoBERTa model was significantly less likely to score a sentiment with at least 90% confidence. The 90% confidence level made up a majority of the Distil-BERT sentiment. Due to the variety of tweets in the dataset, the smaller portion of tweets that the CardiffNLP's RoBERTa model categorized with 90% confidence appear more reliable than the majority inclusion of the Distil-BERT results. The reasoning behind these results may come from fewer layers used by Distil-BERT, as well as CardiffNLP's RoBERTa model being fine-tuned specifically on twitter data.

### Works Cited

Saha, U. et al. (2022). Exploring Public Attitude Towards Children by Leveraging Emoji to Track Out Sentiment Using Distil-BERT a Fine-Tuned Model. In: Chen, J.IZ., Tavares, J.M.R.S., Shi, F. (eds) Third International Conference on Image Processing and Capsule Networks. ICIPCN 2022. Lecture Notes in Networks and Systems, vol 514. Springer, Cham. [https://doi.org/10.1007/978-3-031-12413-6\\_26](https://doi.org/10.1007/978-3-031-12413-6_26)