ECE 684 Final Project Proposal

Efficient Sentiment Classification for Twitter

Bohao (Lexi) Yang (by95)
Bingkun Wang (bw276)
Yuzhao (Clair) Tan (yt221)

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Proposal

This project focuses on three-class sentiment analysis using the TweetEval "sentiment" dataset, a well-established benchmark for Twitter-based sentiment classification. The dataset contains approximately 45,000 training tweets, 2,000 validation samples, and 12,000 test samples, labeled into three categories: negative (0), neutral (1), and positive (2). It was constructed by unifying multiple Twitter corpora, ensuring diverse coverage of topics, writing styles, and linguistic noise, and it provides official splits for consistent evaluation. Our approach is based on fine-tuning language models, starting with Transformer-based language models such as BERT as our baseline model and exploring advanced fine-tuning techniques, like parameter-efficient fine-tuning (e.g., LoRA) to reduce computational cost. We will also compare domain-specific models such as RoBERTa and LLaMa to assess the impact of domain adaptation. Model performance will be evaluated using accuracy and macro-F1 on the official test set, along with robustness analysis under noisy social media conditions. The goal of our project is to establish a strong, interpretable baseline and identify the most effective and noise-resilient approach for tweet-level sentiment classification.

Dataset

`https://huggingface.co/datasets/cardiffnlp/tweet_eval/viewer/sentiment?views%5B%5D=sentiment_train`