# COSE474-2024F: Final Project Proposal
# "Sentiment Analysis of Online Reviews and Social Media Posts"

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## 1. Introduction

Online reviews and social media have become major platforms for people to share opinions. Analyzing the emotions embedded in these texts is crucial for improving user experiences. This project aims to develop a system that automatically classifies the emotions in text data (positive, negative, or neutral), enhancing the ability to understand public sentiment effectively. Sentiment analysis can be valuable in areas such as customer feedback monitoring, social media trend analysis, and marketing strategy development.

## 2. Problem definition & chanllenges

The goal of this project is to build a system that automatically classifies emotions (positive, negative, neutral) from online reviews and social media posts. Sentiment analysis is more complex than simple word analysis. For instance, a single word can be positive or negative depending on the context. Additionally, complicated linguistic expressions like sarcasm or humor are often difficult for sentiment analysis models to grasp. Thus, classifying sentiment in text requires understanding not just words but also the context, making this this task quite challenging.

## 3. Related Works

Sentiment analysis has been a major area of research in natural language processing (NLP). Models such as VADER and TextBlob are widely used for analyzing social media texts. More recently, pre-trained transformer-based models like BERT have shown remarkable performance in sentiment classification tasks. Additionally, BERTweet, a model fine-tuned specifically for social media, has gained popularity due to its ability to handle informal language and web jargon or slang. .

## 4. Datasets

The IMDB movie review dataset and Sentiment140 dataset are widely used for sentiment analysis tasks. The IMDB dataset contains large amounts of text with positive or negative sentiment labels, while Sentiment140 consists of tweets labeled as positive, negative, or neutral.

## 5. State-of-the-art methods and baselines

Transformer-based models like BERT, RoBERTa, and social media-specific models like BERTweet have shown impressive performance in sentiment analysis. BERT-based models are superior to traditional rule-based models because of their ability to understand the context in text, which significantly improves classification accuracy. This project will implement sentiment analysis using BERT and BERTweet models, and the performance will be compared against traditional rule-based models like VADER. The comparison will focus on metrics such as accuracy, precision, and recall.

## 6. Schedule & Roles (if you have a teammate)

Week 1: Dataset preparation and environment setup (IMDB review dataset, Sentiment140 dataset) Week 2: Train sentiment analysis models based on BERT and BERTweet Week 3: Evaluate performance and compare results with traditional models (VADER, TextBlob) Week 4: Final report writing and result analysis

## References

[1] Hutto, C. J., & Gilbert, E. (2014). VADER: A Parsimonious Rule-based Model for Sentiment Analysis of Social Media Text. *Proceedings of the International Conference on Weblogs and Social Media*, 8(1), 216-225.

[2] Devlin, J., Chang, M.-W., Lee, K., & Toutanova, K. (2018). BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding. *arXiv preprint arXiv:1810.04805*.

[3] Barbieri, F., Espinosa-Anke, L., & Camacho-Collados, J. (2020). TWEETNLP: A BERTweet Model for Social Media Text Classification and Generation. *Proceedings of the International Conference on Computational Linguistics*, 9, 4415-4424.