Emotion Analysis Based on Text

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Abstract

Emotion detection from text is a vital component in enhancing human-computer interaction. It can improve customer service through sentiment analysis, aid mental health professionals by analyzing patient journals, and enhance social media platforms' responsiveness to user content. The goal of this project is to develop a machine learning model capable of accurately detecting the emotions from textual data.

1 Execution Plan

The project involves collecting a dataset of emotionally labeled text, preprocessing it for uniformity, and encoding emotions. A Convolutional Neural Network (CNN) will be designed and trained on this data to detect emotions, with its performance evaluated on a separate test set. Finally, the model will undergo fine-tuning and optimization to enhance its accuracy in emotion detection.

1.1 Steps to follow

1. Data Collection: Gather a dataset of text samples labeled with corresponding emotions.
2. Data Preprocessing: Tokenize the text, pad sequences to uniform length, and convert emotion labels to one-hot encoding.
3. Model Development: Design and implement a CNN architecture for emotion detection.
4. Model Training: Train the CNN model on the labeled dataset using appropriate loss function and optimizer.
5. Model Evaluation: Evaluate the trained model on a separate test dataset to assess its performance.
6. Fine-tuning and Optimization: Fine-tune the model and optimize hyperparameters to improve performance if necessary.

1.2 Workload distribution

As a single member team, Peter Kim would work on everything.

1.3 Time table

1. Data Collection and Preprocessing: 1 week
2. Model Development and Training: 2 weeks
3. Model Evaluation and Fine-tuning: 1 week
4. Finalizing Report and Presentation: 1 week

1.4 Expected challenges and how to handle them

I would face challenges when I will be trying to implement the model. Because I am relatively new with CNN, it is most likely to be a challenge to design and implement the code for this. However, by using resources online, (articles that help me understand), I would be able to overcome the challenge. Also, I might face some challenge when preprocessing the data so that it fits well to the model. I can overcome this data by displaying and weighing data to ...

2 Evaluation plan

The model's performance will be measured using metrics like accuracy, precision, recall, and F1-score. Performance Evaluation wouldn't be necessary since it will be a single member team.

References

Note that ChatGPT was used to rephrase sentences.

https://www.kaggle.com/datasets/simaanjali/emotion-analysis-based-on-text

https://machinelearningmastery.com/develop-word-embedding-model-predicting-movie-review-sentiment/

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