CSE 676: Deep Learning, Spring 2024
Final Project - Project Proposal

Team Members

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Title: Deep Learning Analysis of Drug Reviews for Enhanced Healthcare Insights

Short Summary:

This project aims to develop a sentiment analysis model for drug reviews utilizing deep learning technology. Developing a model which has the ability to understand the sentiment expressed in patient reviews of pharmaceutical drugs is of paramount importance as it allows us to identify the side effects, assess the treatments effectiveness, helps to understand the patients experience and enables early detection of issues. This meaningful information helps healthcare professionals make informed decisions, improve the patients care and pay attention to the drug monitoring process. This thorough analysis also helps public make smart and informed decisions about medicines and health care.

Objectives:

- Develop a robust sentiment analysis deep learning model on drug reviews.
- Evaluate the effectiveness of the model in clear interpretation and classification of positive, negative, neutral, and other sentiments.
- Investigate the potential correlations between sentiment patterns and real-world patient outcomes like drug effectiveness, side effects, and user demographics.
- Utilize the insights gathered to improve patient care and empower public decision-making.

Methodology:

The project will employ a combination of natural language processing (NLP) and deep learning techniques. We plan to use recurrent neural networks (RNNs) for their ability to capture contextual information in sequential data. Fine-tuning of models on drug review datasets will be explored to enhance model performance. Additionally, transfer learning with word embeddings will be implemented to improve the model's understanding of medical terminologies and domain-specific language.

Evaluation:

The results will be evaluated qualitatively. Standard metrics such as accuracy, precision, recall, and F1 score will gauge the model's performance on the test dataset. It will further involve the analysis of sample predictions and misclassifications. Further, a comparative analysis against baseline models will also be incorporated to provide insights into the effectiveness of

our approach. This evaluation strategy ensures a comprehensive understanding of our model's strengths and areas for improvement to build an insightful sentiment analysis deep learning model for drug reviews.

Dataset:

The dataset we plan to use is retrieved from the well-known UCI Machine Learning Repository.

UCI Machine Learning Repository: https://archive.ics.uci.edu/

Drug Review Dataset:

https://archive.ics.uci.edu/dataset/462/drug+review+dataset+drugs+com

References:

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