**Title:**

Sentiment analytical system to enhance patient satisfaction on drugs using a fine-tuned Python libraries-based model.

**Abstract:**

Sentiment analysis is a subfield of Natural Language Processing (NLP) that understands people's emotions, attitudes, appraisals, and opinions in unstructured text about topics, issues, entities, events, and products. Sentiment analysis will enable us to interpret these numerous drug reviews data and the information will improve the health care system.

Based on the review of literature and theoretical frameworks, I found out that patient satisfaction on medications is very important and enhancing it would help in making sure that drugs prescribed to patients work perfectly well and that patients are satisfied with these drugs. These led to the source of this study, a sentiment analytical system to enhance patient satisfaction on drugs using a fine-tuned model based on the Python libraries.

Several sentiment analysis Python libraries have been used to enhance patient satisfaction. Examples include: NLTK (Natural Language Toolkit) is a sentiment analysis Python tool that includes several sentiment analysis tools. The gap with this library is that it is very complex and has low performance on very large datasets.

VADER (Valence Aware Dictionary and sEntiment Reasoner) is a sentiment analysis tool that is sensitive to the positivity, negativity, and neutrality of emotions. And it’s available as one of the NLTK libraries. The gap with this library is that it lacks deep contextual understanding and has a domain-specificality issues because of being designed for social media.

TextBlob: is a sentiment analysis python library that is simple to use, provides part-of-speech tagging, noun phrase extraction, classification, etc and i00s built on top of NLTK and pattern. It provides part-of-speech tagging, noun phrase extraction, sentiment analysis, classification, translation, and more. The gap with this library is that it results in less accurate sentiment analysis of complex texts, and it can be slow when implemented on large datasets.

My proposed system key features will enhance patient satisfaction on drugs using this sentiment analysis algorithm which will be based on Textblob, Spacy, and Naive Bayes. It would solve the issue of accuracy and performance on large datasets and make the system to be more efficient by preprocessing and applying word embeddings to the patient data using a library called Spacy. It would be easy to interact with and enable simple application of sentiment analysis on the reviews of the patients' satisfaction through the use of the Python library Textblob. This system would evaluate the performance of the classifier to make the system to be accurate through the use of Naive Bayes. Finally, this system's results would provide valuable insights into Gen AI's capabilities in enhancing patient satisfaction with drugs.

By contrasting these Sentiment Analysis methodologies, the research clarifies the intricacies of AI-driven methodologies in interpreting patient sentiments and provides recommendations for optimizing the integration of such technologies into healthcare systems. Ultimately, this research aims to inform healthcare practitioners, policymakers, and AI experts about the potential of Gen AI in enhancing patient satisfaction with medications (drugs) and fostering more patient-centered healthcare delivery models. The outcomes of this study have implications for the advancement of AI-driven solutions in healthcare and underscore the importance of leveraging innovative technologies to meet patients' evolving needs and expectations.