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**INTRODUCTION**

* Sentiment analysis is a key technique in Natural Language Processing (NLP)
* It helps understand public emotions expressed on social media platforms
* Growing importance in areas such as marketing, public policy, and crisis management

**PROBLEM STATEMENT**

* The rise of social media has resulted in a massive volume of opinionated data
* Businesses and organizations struggle to interpret these opinions at scale
* There’s a need to decode nuanced emotions beyond basic sentiment

**OBJECTIVES**

* Analyze and interpret emotions from social media text
* Classify sentiments as positive, negative, or neutral
* Identify specific emotions like joy, anger, fear, etc
* Derive actionable insights from emotional trends

**DATA COLLECTION**

* Sources: twitter, reddit, facebook, youtube comments
* Tools: tweepy, pushshift api, web scraping tools
* Data size: [insert number of records or date range]

**DATA PREPROCESSING**

* Removing stopwords, links, mentions, and emojis
* Converting text to lowercase, tokenization, lemmatization
* Handling slang, abbreviations, and emoticons

**SENTIMENT CLASSIFICATION TECHNIQUES**

* Lexicon-Based Methods: VADER, TextBlob
* Machine Learning Models: Logistic Regression, Naive Bayes, SVM
* Deep Learning Models: LSTM, BERT for context-aware analysis

**EMOTION DETECTION**

* Detect specific emotions using emotion lexicons (e.g., NRC EmoLex)
* Emotions include: Joy, Anger, Fear, Sadness, Surprise, Disgust
* Multi-label classification for nuanced results

**FEATURE EXTRACTION**

* Bag of words (bow)
* Tf-idf (term frequency-inverse document frequency)
* Word embeddings (word2vec, glove)
* Transformers (bert embeddings)

**MODEL EVALUATION**

* Evaluation Metrics
* Accuracy
* Precision
* Recall
* F1-Score
* Confusion Matrix for visualization

**VISUALIZATION OF RESULTS**

* Sentiment distribution bar/pie charts
* Word clouds for each emotion
* Time-series plots showing emotion trends over time

**REAL-WORLD APPLICATIONS**

* Customer experience analysis
* Political sentiment tracking
* Market research and product feedback
* Mental health monitoring

**CHALLENGES**

* Detecting sarcasm and irony
* Handling mixed languages and regional dialects
* Dealing with short forms, slang, and spelling errors
* Privacy and ethical considerations

**FUTURE SCOPE**

* Real-time emotion tracking
* Multimodal sentiment analysis (text + images + voice)
* Support for regional and low-resource languages
* Emotion-aware chatbots and assistants

**CONCLUSION**

* Sentiment analysis enables powerful emotion insights
* Helps businesses, researchers, and governments make informed decisions
* Continuous improvements in AI/ML models will enhance emotional intelligence of systems

THANKS YOU