Sentiment Analysis using Customer Reviews

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Abstract: *Traditional sentiment analysis relies heavily on textual data, limiting its effectiveness in environments where voice is the primary communication mode or emotional intent is not fully captured through text alone. This project proposes a hybrid sentiment analysis system that integrates both text and audio inputs to overcome these limitations. The framework leverages speech recognition to transcribe spoken language and applies transformer-based NLP models (e.g., BERT, RoBERTa) for text analysis. In parallel, it extracts prosodic and acoustic features (such as pitch, tone, and tempo) from audio signals to enhance emotional interpretation. By combining textual and vocal cues, the system achieves a deeper understanding of sentiment, enabling more accurate and context-aware emotional analysis. This multimodal approach is particularly valuable in areas such as law enforcement (e.g., threat assessment), healthcare (e.g., mental health monitoring), and customer service (e.g., empathetic AI interactions), where detecting emotional nuance is critical. This project aims to contribute to the development of emotionally intelligent AI systems capable of understanding not just what is said, but how it is said.*

Keywords: Sentiment analysis, multimodal analysis, text and audio integration, speech recognition, transformer-based NLP, BERT, RoBERTa, prosodic features, acoustic features, emotion detection, context-aware analysis, emotional intelligence, hybrid sentiment system, voice-based communication, natural language processing, audio signal processing, mental health monitoring, threat assessment, empathetic AI, human-computer interaction