IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 6, Issue 2, March 2026
Impact Factor: 8.2

Emotion Detection from Text Using NLP

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Abstract: *Emotion may be shown in a variety of ways, including voice, written texts, and facial expressions and movements. Emotion detection in text is essentially a content-based classification challenge that combines concepts from natural language processing and machine learning. This paper addresses textual data-based emotion identification algorithms and emotion detection.*

Keywords: Emotion Recognition; Natural Language Processing; Key-word based detection; Text Processing, Sentimental measures

I. INTRODUCTION

The majority of literary expressions come from interpreting the meaning of concepts and how those concepts interact with one another in addition to from the usage of emotive language. Analysing a person's emotional state through a text document they have written can be challenging, but it is also important in many circumstances. In the human-computer interface, it is crucial to recognise the text's emotional content [1]. Speech-based, facial-based, and text-based emotions, respectively, refer to the ways in which emotions can be represented by a human being via written language, spoken words, and facial expressions. Academics still need to pay attention to text-based emotion detection algorithms notwithstanding the fact that enough work has been done to recognise emotions in speech and on the face[2]. From an application standpoint, it is becoming more and more crucial in computational linguistics to identify human emotions in text.

Happy, sad, angry, surprised, fearful, and so on are emotions. Ekman [3] divides emotions into six separate categories, including joy, sadness, fear, surprise, rage, and disgust. Generally speaking, a person's voice, written words, gestures, and facial expressions all convey their mood and feelings [4]. Unlike facial expression and speech recognition, a written statement lacks taste and so loses its ability to identify itself. Because of the text's intricacy and ambiguity, identifying its emotions is a difficult task. It is hard to tell the mood of a given text since words might have many meanings and morphological forms.

ability for a object to sense or feel emotions similar to those of a human. Since tasteless text sentences lack any tone or expression, our suggested approach is able to identify emotions from them. A single dataset has been the subject of many studies. For the purpose of detecting emotions, however, we have worked with three datasets that include text in the form of comments, basic words, and dialogues. We can use any technology to implement our text-based emotion recognition model. This model's business potential includes the ability to identify feelings in consumer reviews of goods and services, as well as to give social media users security.

II. LITERATURE REVIEW

Emotion detection from text has become an important topic in the field of Natural Language Processing (NLP). It focuses on identifying human emotions such as happiness, sadness, anger, fear, and surprise from written language. Many researchers have explored different techniques including lexicon-based methods, machine learning models, and rule-based approaches to improve the accuracy of emotion recognition systems.

Shivhare and Khethawat (2012) conducted one of the early studies on emotion detection from text. Their work focused on identifying emotions using linguistic features and emotional keywords present in sentences. The study showed that

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text can contain strong emotional indicators through words and phrases. However, the approach mainly depended on predefined dictionaries, which made it difficult to detect emotions in complex or context-dependent sentences.

Shaheen et al. (2014) proposed a rule-based approach for emotion recognition using automatically generated rules. Their method used linguistic patterns and semantic relationships between words to classify emotions more accurately. The study demonstrated that combining syntactic and semantic analysis could improve the performance of emotion detection systems compared to simple keyword matching techniques.

Jain and Sandhu reviewed various machine learning techniques used for emotion detection from text. Their work discussed algorithms such as Naïve Bayes, Support Vector Machines, and Decision Trees. The authors explained that machine learning models can learn patterns from large datasets and provide better emotion classification compared to traditional lexicon-based methods. They also highlighted the importance of proper data preprocessing and feature extraction.

III. EXISTING SYSTEM

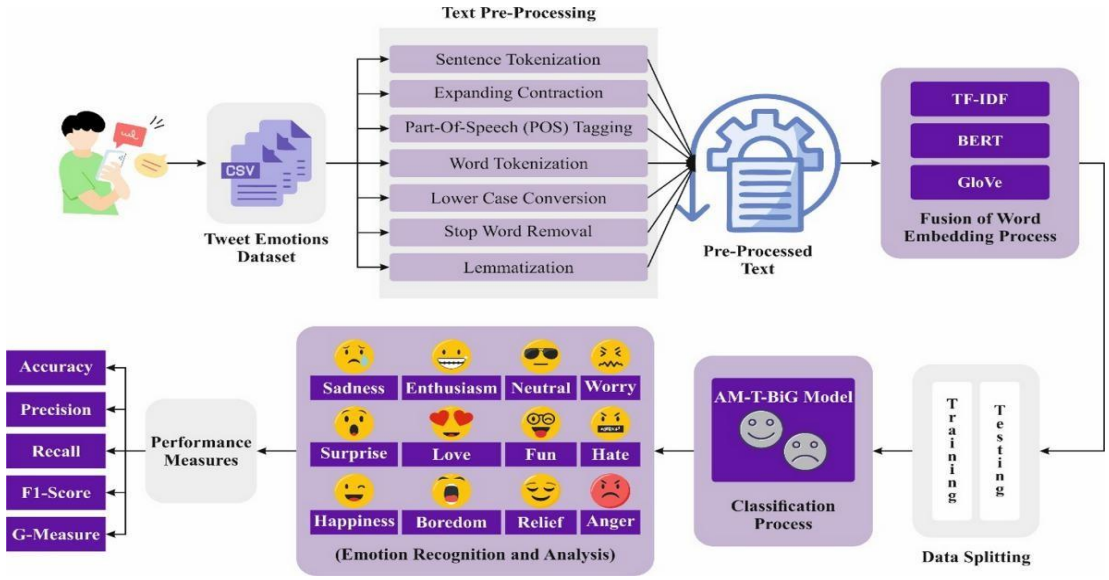
A crucial aspect of human existence is emotion. These feelings affect how people make decisions and improve how we express ourselves to others. The process of determining a person's various feelings or emotions (such joy, sorrow, or fury); also known as emotion detection or recognition. Researchers have worked hard in the last few years to automate the recognition of emotions. However, several bodily behaviours, hand trembling and voice pitch, can also be used to infer an individual's emotional state [5]. However, it can be challenging to discern emotions in text. The difficulty of detecting emotions in text is further increased by the numerous ambiguities and new lingo or terminology that are being used every day. Additionally, emotion recognition tends to go beyond simply detecting the basic psychological states (happiness, sadness, and anger).

IV. PROPOSED SYSTEM

Different systems are going to use in the proposed system. They are:

- Emotion text identified with NRCLex method
- Emotion text identified with Neural Network method
- Emtoion text identified with NLP method

V. SYSTEM ARCHITECTURE



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The emotion detector system has three key components: - Text Preprocessing: The input text is preprocessed with methods such as punctuation stripping, lowercasing, and stop-word removal. - Feature Extraction: We tokenize and utilize Bag of Words/TFIDF features. - Model Prediction: We use a pre-trained machine learning model (Multinomial Naive Bayes) trained on labeled emotion data for classification.

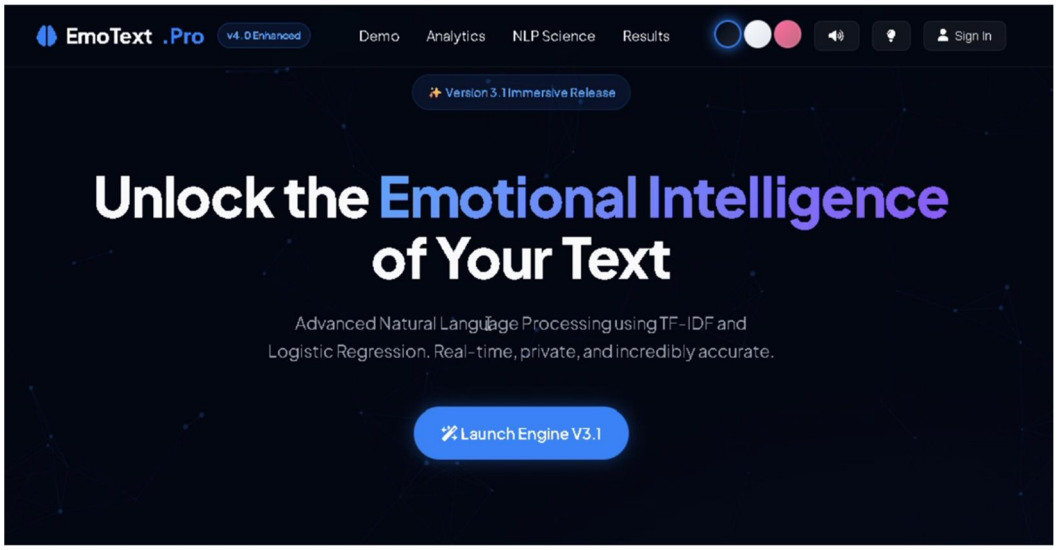
VI. METHODOLOGY

In this approach, we are classifying the input text into different emotions by finding the emotional content from the given English text. The emotional contents are verbs, adverbs, adjectives, phrases or combination of these keywords. For example, *"We are going on a vacation. I'm very excited"*. The keyword *"excited"* represents *"happiness"* or *"joy"*, using such keywords emotions can be classified .The source of input to the system is textual content from social networking websites such as product reviews, comments, personal blogs, feedbacks etc. The very first step is to define the structure of text in order to determine the algorithm used for emotion classification. In this approach, the structure is defined as follows:

- Each text is a list of sentences
- Each sentence is a list of tokens
- Each token is a tuple of three elements: a word form (the exact word that appeared in the text), a word lemma (a generalized version of the word), and a list of associated tags

VII. RESULTS AND DISCUSSION

The system was tested with several real-life examples and operated smoothly in emotion classification. Some sample inputs and system predictions are listed below:



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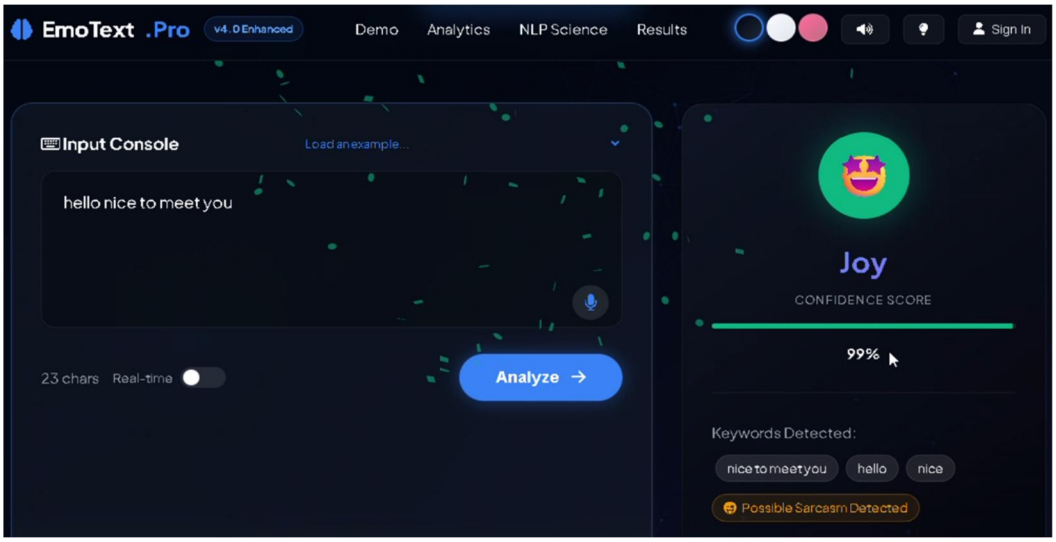

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DOI: 10.48175/568

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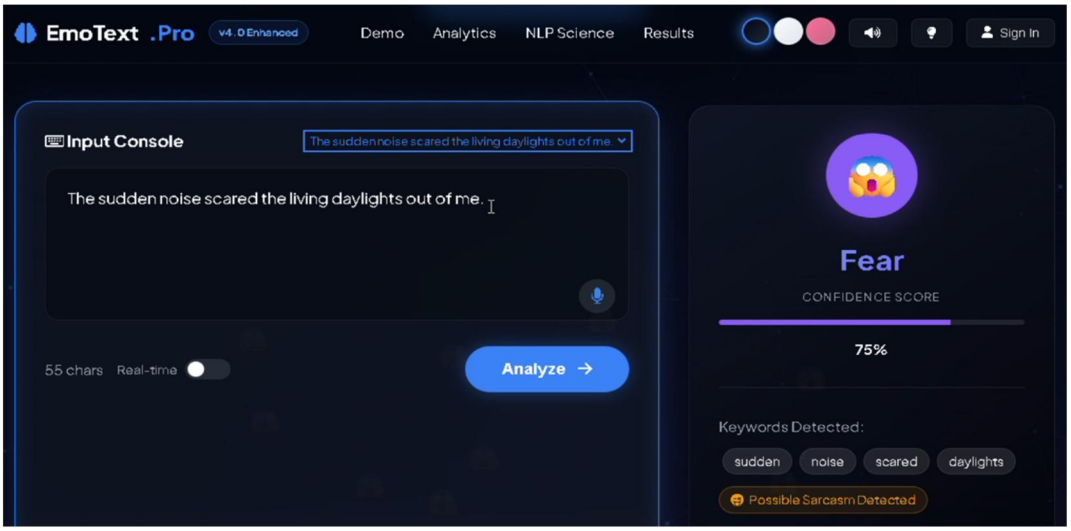
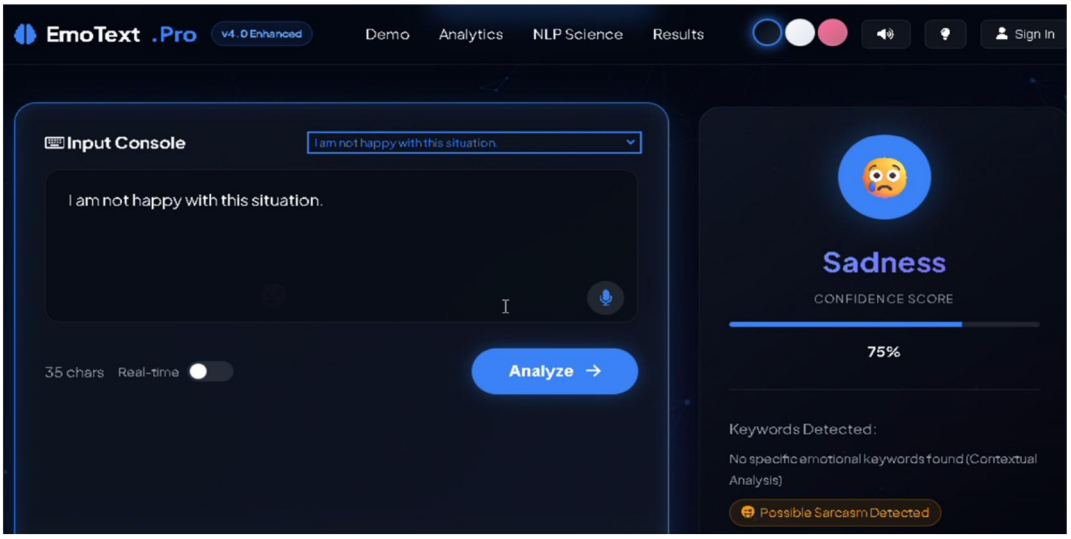
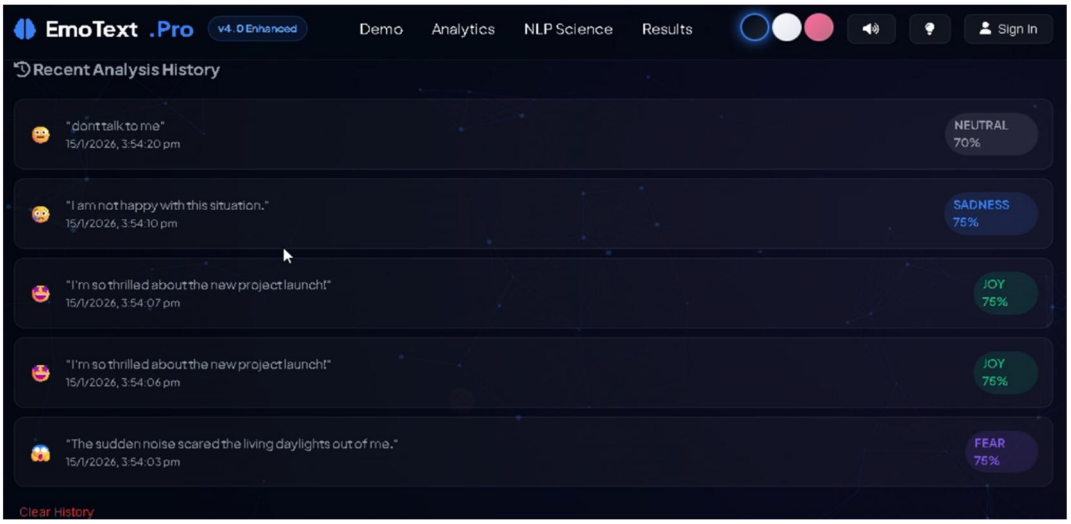




8.CONCLUSION



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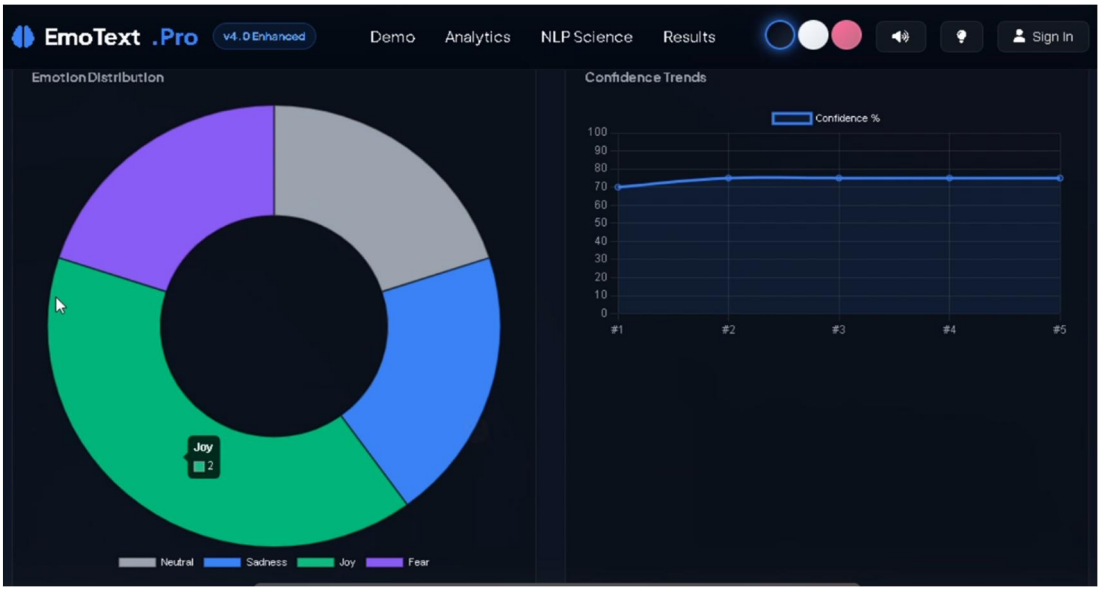

Emotion detection from text using Natural Language Processing (NLP) is a powerful technology that helps computers understand human feelings through written words. By analyzing sentence structure, word choice, context, and tone, NLP models can identify emotions such as happiness, sadness, anger, fear, or surprise.

This technology is widely used in real-world applications like customer feedback analysis, social media monitoring, mental health support systems, and chatbots. It helps businesses understand customer opinions, allows organizations to track public sentiment, and supports better human-computer interaction.

Although emotion detection has improved greatly with machine learning and deep learning techniques, it still faces challenges. Human emotions are complex, and text may include sarcasm, slang, cultural differences, or mixed emotions, which can make accurate detection difficult. Therefore, continuous improvement in language models and training data is important.

In conclusion, emotion detection from text is an important and growing field in NLP. It makes communication between humans and machines more meaningful by enabling systems to recognize and respond to emotions in a more human-like way.

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