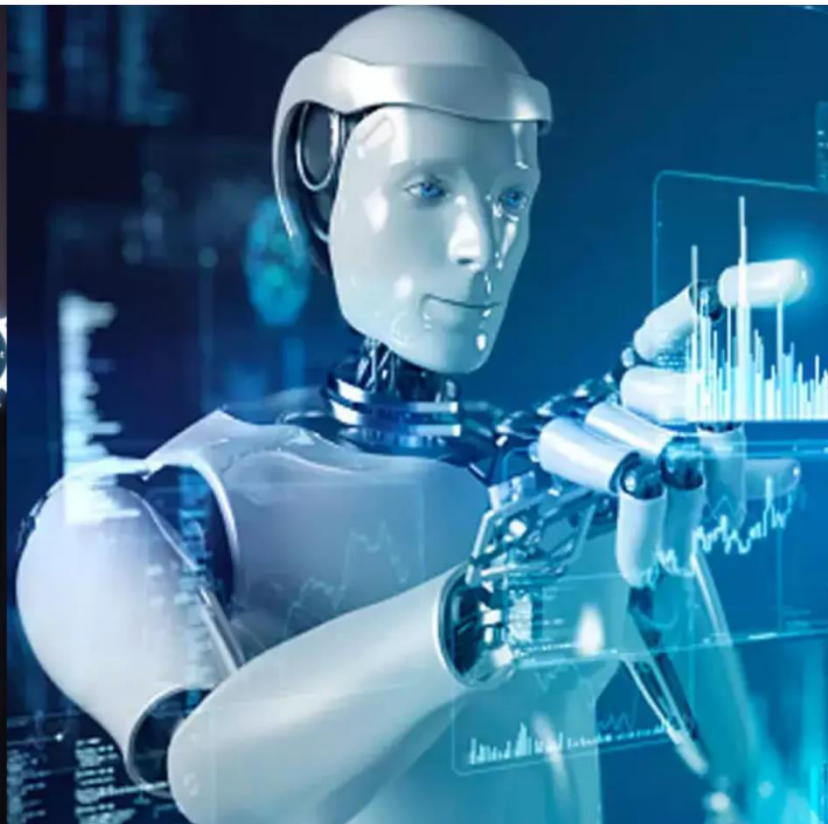




International Journal of Innovative Research in Science Engineering and Technology (IJIRSET)

(A Monthly, Peer Reviewed, Refereed, Scholarly Indexed, Open Access Journal)



Impact Factor: 8.699

Volume 14, Issue 3, March 2025

Emotion-Based Detection of Mental Health Risks in Social Media

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ABSTRACT: Detecting mental disorders like depression and anorexia through social media is crucial for providing timely support. This paper studies how emotions shared on social media can be analyzed to find signs of these disorders. The existing system uses methods like word patterns, emotion-based features, and sentiment analysis. However, these methods struggle to detect small emotional changes and are less accurate and harder to understand. The proposed system uses BoSE (Bag of Sub-Emotions) to study emotions in posts and Dynamic-BoSE to track changes in emotions over time. By combining these representations with the Classification Filtering Algorithm in Java, the system achieves better accuracy and reliability in detecting mental disorders. These methods are simple to understand and useful for creating tools to monitor mental health and offer timely support.

KEY WORDS: Mental disorders, Anorexia, Emotion-Based, BoSE, Dynamic BoSE.

I. INTRODUCTION

Over the past three decades, mental disorders have gained significance in public health, comprising about 12% of global disease diagnoses. Common Mental Disorders (CMD), including depression and anxiety, are projected to be leading causes of disability by 2030. Depression, affecting over 350 million people, results from biological factors like neurotransmitter imbalances, genetics, and substance use. Psychoactive drugs such as alcohol and cocaine exacerbate CMD and depression by altering cognitive and psychological functions.

Machine Learning (ML) have become essential in healthcare, aiding in pattern recognition and predictive analytics. This study evaluates DM and ML techniques for pre-diagnosing CMD and depression, focusing on psychoactive drug use and socio-economic factors to develop predictive models and support healthcare policies.

II. LITERATURE SURVEY

The use of social media data for Automatic Image Annotation (AIA) was explored by Argyrou et al. [1], who leveraged Instagram hashtags as a training dataset. They found that only 20% of hashtags accurately describe image content, necessitating filtering techniques. They applied Latent Dirichlet Allocation (LDA) for topic modeling to enhance image annotation, providing an alternative approach to training AIA models. Aydin et al. [2] investigated crowdsourcing for multiple-choice question answering, developing a system based on the "Who Wants to Be a Millionaire?" quiz. They found that simple aggregation achieved over 90% accuracy, but for more difficult questions, this dropped to 60%. By incorporating weighted aggregation schemes based on participant reliability, they improved the accuracy rate by 15%.

The detection of online cyber grooming was studied by Bours and Kulsrud [3]. Their research focused on detecting sexual predators in online conversations using message-based, author-based, and conversation-based classification methods. Their findings indicate that early detection of predators is possible within 26-161 messages, highlighting the effectiveness of machine learning in identifying harmful interactions. Dombrowski et al. [4] examined online sexual solicitation and protective strategies for youth. Their study reviewed predator tactics, legal frameworks, and preventative measures such as technological tools and educational initiatives. This work provides essential guidelines for psychologists and legal professionals addressing online predatory behaviour. A comprehensive analysis of Child Sexual Abuse Material (CSAM) detection techniques was presented by Lee et al. [5]. Their research covers policy

frameworks, distribution channels, and detection methodologies. They concluded that combining deep-learning algorithms with multi-modal descriptors is the most effective approach for CSAM detection.

III. METHODOLOGY

A hybrid approach combining Lexicon-Based Analysis (LIWC) and Deep Learning (BERT, LSTM) enhances the detection of mental health disorders from social media. Additionally, Graph Neural Networks (GNNs) analyse user interactions to detect social isolation and relationship dynamics. By modelling users and their connections, GNNs identify patterns like reduced engagement and community influence, providing deeper behavioural insights. Mental health detection improves when multiple data types are considered together: Text Analysis, Image Analysis, Emoji Usage. To further enhance detection, Transformer models (GPT-4, RoBERTa) refine contextual understanding, differentiating between casual language and serious distress. These models ensure better accuracy in interpreting user intent and behaviour over time.

IV. EXPERIMENTAL RESULTS

Figures shows that the results of Detection of Mental Health Risks In Social Media by using machine learning algorithms. Fig 1(a) shows User Login page. (b) shows Registration page for the user if the user is new. (c) shows Home page for the entire application.

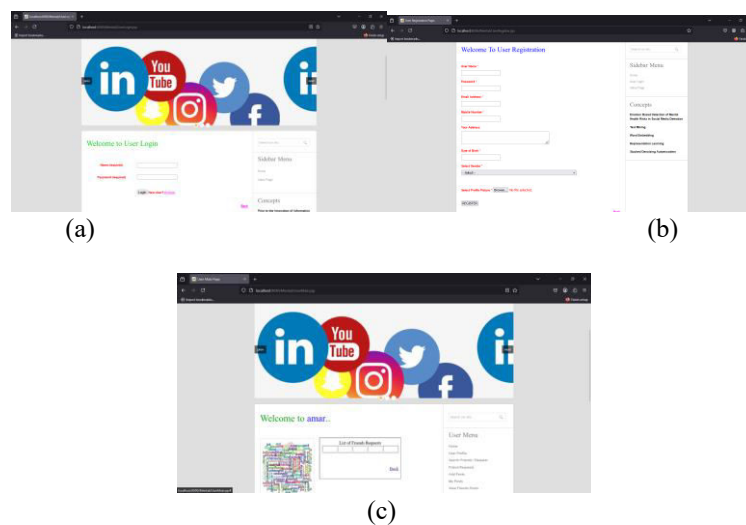
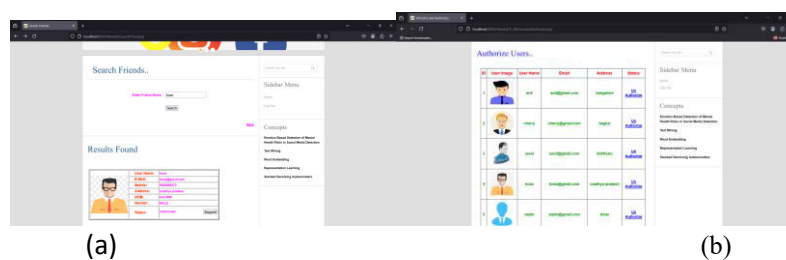
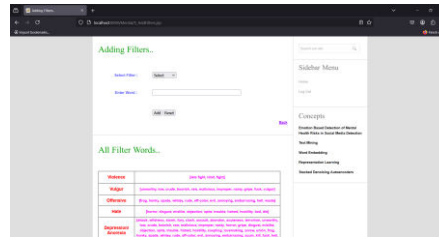


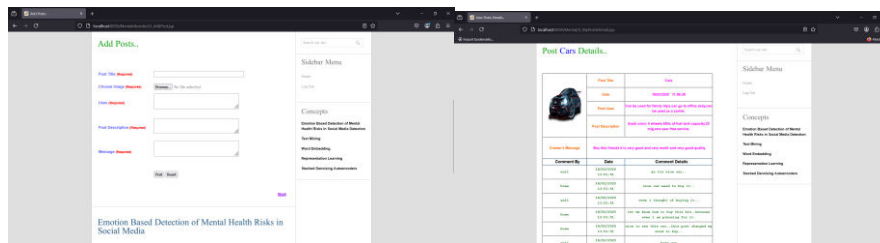
Fig. 2. Shows Admin responsibilities (a) Shows a user to find a friend. (b) Admin views and authorises users. (c) Admin adds filter words.





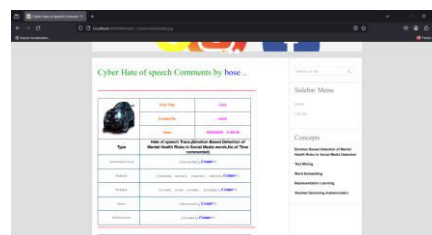
(c)

Fig. 3. Shows detection of Hate speech from the post. (a) User uploads a post. (b) Other friend post comments. (c) Detection a hate speech comment.



(a)

(b)



(c)

V. CONCLUSION

In conclusion, this paper focuses on detecting mental health risks in social media by analysing emotional patterns in user-generated content. By leveraging natural language processing and machine learning techniques, the system efficiently identifies and categorizes harmful speech, including hate, vulgar, and offensive language. This approach not only aids in early detection of distressing content but also contributes to creating a safer digital space by reducing the spread of harmful interactions. The experimental results demonstrate the system's effectiveness in accurately classifying harmful comments and providing insights into online user behaviour. Additionally, the project lays a foundation for future enhancements, such as improving classification accuracy, incorporating real-time monitoring, and integrating with multiple social media platforms. Expanding the dataset and refining detection models will further strengthen the system's ability to identify subtle emotional patterns, ensuring more reliable detection of potential mental health risks.

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