# Research Report:

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Topic Name: Sarcasm Detection in Bengali: A Neural Network Approach

## Introduction:

Sarcasm, a unique form of verbal irony, poses a challenge for machines due to its dependency on contextual and inner meaning. For various applications, including social media analysis, opinion mining, and chatbot development the ability to understand sarcasm is vital. This paper aims to show an effective sentiment analysis in Bengali language processing, emphasizing the challenges caused by the lack of a comprehensive Bengali corpus and the trend of sarcasm in social media platforms.

## Related Work:

Existing paper had worked on methods for detection of sarcasm using different approaches like machine learning and deep learning. The limitations were less accuracy and inability to handle complex level sarcasm and also lack of explanation.

## Methodology:

The proposed paper aims to support GloVe word representation and an LSTM neural network to detect sarcasm in Bengali. By merging sentiment analysis into identified sarcastic sentences with enriched training data, and using Logistic Regression, K-NN, SVM algorithms for analyzing sentiment with more accuracy. The method aims to unlock a deeper understanding of emotional variances in Bengali text for applications in diverse domains.

## Results:

After applying the methods they found out that Linear SVM has the highest precision, which is 91.4%. Alongside, Logistic Regression (LR) also has an accuracy of 72.04% and a superior F1-score of 68.15%.

## Discussion:

While promising, the paper acknowledges limitations. The effectiveness of the method depends on the quantity and quality of training data. The neural network's lack of transparency poses challenges for improvement, and the paper suggests exploring the learned features for deeper insights. Additionally, the report encourages further research into alternative techniques and their combination to enhance sarcasm detection and sentiment analysis in Bengali text.

There are still some limitations that may prevail. The quality and quantity of the dataset could be improved. As the Neural Network lacks clarity it is hard to go deeper.

## Conclusion:

The proposed approach demonstrates promising results in sarcasm detection and sentiment analysis for Bengali text. The strengths of Linear SVM in precision and LR in overall performance highlight the method's potential in addressing challenges. However, the paper emphasizes the need for continued data gathering, transparency improvement, and exploration of alternative techniques to further advance research in this field. The successful implementation of these recommendations could lead to improved understanding of emotions and intentions expressed in Bengali text, with far-reaching implications for applications in e-commerce, social media, journalism, and beyond.