

# Experiment – 01

## Paper 1 – Multi-modal Sarcasm Detection and Humor Classification in Code-mixed Conversations

### Introduction:

This paper endeavors to tackle the intricate problem of detecting sarcasm and humor in code-mixed conversations, particularly in languages like Hindi, where the availability of high-quality annotated datasets is severely limited. The authors commence by shedding light on the inherent complexity of sarcasm and humor detection. These are multifaceted issues, given their reliance on contextual nuances and non-verbal cues. Moreover, the study emphasizes that existing research primarily revolves around English text, leaving a significant void in non-English languages. The authors aim to bridge this gap by presenting two pivotal contributions: firstly, they introduce a novel Hindi-English code-mixed dataset named MaSaC1, which serves as a foundational resource for multi-modal sarcasm detection and humor classification in conversational dialogue. Secondly, they propose a cutting-edge neural architecture, MSH-COMICS2, specifically designed to address these challenges.

### Problem Statement:

Sarcasm and humor detection are exceedingly intricate tasks owing to their susceptibility to contextual and non-verbal factors. The dearth of qualitative annotated datasets in non-English languages like Hindi poses a substantial hindrance to the development of effective models for sarcasm and humor detection in these languages.

### Model:

To mitigate the complexity of multi-modal sarcasm detection and humor classification, the authors introduce MSH-COMICS2. This neural architecture leverages hierarchical and contextual attention mechanisms, enabling it to efficiently represent utterances. Notably, the hierarchical attention mechanism allows the model to focus on small segments of input sentences sequentially. Furthermore, the inclusion of dialog-level contextual attention mechanisms enables MSH-COMICS2 to harness the historical context of conversations, a crucial factor in multi-modal classification tasks.

## **Technologies:**

The technological underpinnings of this paper encompass advanced concepts in neural network architectures, with a particular emphasis on hierarchical and contextual attention mechanisms. These technologies are instrumental in achieving effective multi-modal sarcasm detection and humor classification.

## **Conclusion:**

The culmination of the authors' research manifests in the form of MSH-COMICS2, a neural architecture that not only outperforms existing models but also sets a new benchmark. The model demonstrates its prowess by achieving more than a 1 F1-score improvement in sarcasm detection and a remarkable 10 F1-score point increase in humor classification when compared to its predecessors. These results showcase the superiority of MSH-COMICS2 in addressing the challenges posed by multi-modal sarcasm detection and humor classification in code-mixed conversational dialogues. In essence, this paper significantly contributes to the field by filling a critical void in research concerning non-English languages.

## **Paper 2 - Sarcasm Detection of non # tagged statements using MLP-BP**

### **Introduction:**

This paper takes a deep dive into the domain of sarcasm detection within textual content that lacks explicit sarcasm tags. It elucidates the challenge of deciphering sarcastic features from text where sarcasm is used to convey sentiments in direct opposition to the literal meaning.

### **Problem Statement:**

The central issue revolves around detecting sarcasm in text, especially when it lacks overt sarcasm indicators such as hashtags or tags. The primary challenge lies in extracting and identifying pertinent features that facilitate accurate sarcasm classification.

### **Model:**

To address the conundrum of sarcasm detection in non-tagged statements, the authors propose a novel technique founded upon structural, affective, and semantic similarity features. The bedrock of this approach is the Multilayer Perceptron-Backpropagation (MLP-BP), a neural network architecture known for its capacity to learn intricate patterns in data.

### **Technologies:**

The primary technological innovation in this paper is the utilization of MLP-BP, a neural network architecture proficient in handling complex data patterns. This technology serves as the cornerstone of the proposed technique for sarcasm detection in non-hashtag-laden textual content.

### **Conclusion:**

While the paper introduces an intriguing technique for sarcasm detection, it falls short in providing an exhaustive performance evaluation and dataset description. Although the proposed approach holds promise for classifying sarcasm in text that lacks explicit tags, further validation and testing are imperative. This paper lays the foundation for potential advancements in the domain of sarcasm detection but requires additional research to substantiate its efficacy.

# **Paper 3 - Sarcasm Detection of Online Comments Using Emotion Detection**

## **Introduction:**

This paper embarks on a journey to explore the intricate realm of sarcasm detection within online comments by intertwining it with the nuances of emotions. It underscores the significance of emotion and sarcasm analysis in contemporary marketing strategies. The authors lay the groundwork for a system that delves into the dual aspects of grouping posts based on emotions and sentiments while concurrently identifying the presence of sarcasm.

## **Problem Statement:**

The crux of the challenge lies in effectively detecting sarcasm in online comments while taking into account the emotional and sentiment-laden context. The authors accentuate the growing importance of amalgamating emotion and sarcasm analysis to refine marketing strategies by gauging public sentiment towards brands.

## **Model:**

The heart of the proposed solution is a comprehensive system that proficiently groups posts based on emotions, sentiments, and sarcasm. This system amalgamates sentiment and emotion identification modules, creating a holistic approach. It harnesses lexical databases, sentiment scores, and diverse sarcasm detection algorithms. The paper further explicates the intricate sentiment and emotion identification process, which involves evaluating word scores, utilizing lexical databases such as WordNet and SentiWordNet, and deploying sarcasm detection algorithms like Emoticon sarcasm detection, Hybrid sarcasm detection, Hashtag Processing, and Interjection Word Start (IWT).

## **Technologies:**

The paper draws upon a plethora of technologies to realize its ambitious system, including lexical databases such as WordNet and SentiWordNet. It also incorporates an array of sarcasm detection algorithms, including Emoticon sarcasm detection, Hybrid sarcasm detection, Hashtag Processing, and Interjection Word Start (IWT).

## **Conclusion:**

This paper presents an innovative and holistic approach that amalgamates emotion and sarcasm analysis within the realm of online comments. However, it leaves room for improvement in terms of providing a more comprehensive performance evaluation and dataset details. While this approach holds substantial promise for refining marketing strategies and understanding online sentiment, further research and validation are indispensable to solidify its applicability and effectiveness.

## Comparison:

Criteria	Paper1	Paper 2	Paper 3
<b>Problem Statemen</b>	Detect sarcasm and humor in code-mixed conversations, especially in non-English languages like Hindi, lacking annotated data.	Detect sarcasm in text, including cases without explicit sarcasm tags, focusing on extracting sarcastic features.	Detect sarcasm in online comments while considering emotions and sentiments, with applications in sentiment analysis for marketing.
<b>Solution</b>	Introduces a novel neural architecture (MSH-COMICS) with hierarchical and dialog-level contextual attention mechanisms.	Proposes a technique based on structural, affective, and semantic similarity features using MLP-BP.	Develops a system that groups posts based on emotions, sentiments, and sarcasm using lexical databases, sentiment scores, and sarcasm detection algorithms.
<b>Technologies</b>	Utilizes hierarchical attention, dialog-level contextual attention, and multi-modality.	Utilizes Multilayer Perceptron-Backpropagation (MLP-BP).	Utilizes lexical databases like WordNet and SentiWordNet, along with various sarcasm detection algorithms.
<b>Dataset</b>	MaSaC1 code-mixed dataset.	Reddit Dataset.	Comments from Facebook.
<b>Performance Evalution</b>	Achieves superior F1-scores (>1 point for sarcasm, 10 points for humor) compared to existing models.	Focused on proposing a technique; specific performance metrics not discussed.	Not explicitly mentioned.
<b>Applicability</b>	Relevant for multilingual social	Relevant for sarcasm detection in text data, particularly	Relevant forl understanding online sentiment and

	media sentiment analysis.	where explicit sarcasm tags are missing.	detecting sarcastic content for marketing purposes.
<b>Challenges</b>	Handling contextual and non-verbal cues in code-mixed conversations.	Extracting sarcasm features from text with semantics and emotions.	Identifying sarcasm in posts that express emotions opposite to their intended meaning.
<b>Conclusion</b>	Highlights superior model performance and emphasizes the importance of in-depth analysis.	Suggests potential for sarcasm classification but lacks detailed performance evaluation.	Suggests potential for emotion-driven sarcasm detection but lacks detailed performance evaluation and dataset information.