

# **Review: Just Like a Human Would, Direct Access to Sarcasm Augmented with Potential Results and Reaction**

Priyanka G. Bhamare

---

## **1. Summary**

### **1.1. Motivation:**

Sarcasm refers to the use of words that mean the opposite of what you want to say, especially to insult someone, to show irritation, or just to be funny. The motivation of this research paper is rooted in the widespread use of sarcasm in social media such as Twitter and Weibo. The paper identifies sarcasm as a form of irony that is characterized by conveying mockery and contempt through an incongruity between surface positive expressions and underlying negative situations. The paper acknowledges the prevalence of sarcasm in online communication and recognizes the challenge of accurately identifying sarcasm due to its complicated nature. The potential crisis is the limitation of existing Sarcasm Detection (SD) methods. The authors note that traditional approaches, including rule-based methods and neural networks, have struggled to capture implied negative situations associated with sarcasm, often relying on observable text content without considering broader context and background information. The niche of the paper lies in proposing a novel approach, SD-APRR, which aims to overcome these weaknesses.

### **1.2. Contribution:**

This paper introduces a ground-breaking approach to sarcasm detection, namely, Sarcasm Detector with Augmentation of Potential Result and Reaction (SD-APRR). One of the key innovations is that SD-APRR proposes a novel approach by simulating human thinking, where each sarcastic text is treated as an incomplete version lacking content related to implied negative situations. The paper employs common-sense reasoning tools, specifically COMET, which plays a crucial role in estimating the potential results and human reactions for each training sample. This helps understand sarcastic content by incorporating external knowledge i.e., background or context.

Another contribution to note is the introduction of a graph-based encoder complemented by a denoising module. This encoder transforms training samples into dependency graphs, offering a visual representation of syntactic structures. This novel approach outperforms traditional text-based methods capturing the nuanced incongruity present in sarcasm. The denoising module is a strategic addition which mitigates potential inaccuracies in the results and reactions inferred by COMET.

Thirdly, the experimental results validate the efficacy of SD-APRR. This method consistently outperforms existing baselines through meticulous evaluations of benchmark datasets. This evidence underscores the practical significance of the proposed approach, highlighting its claim to superiority in sarcasm detection.

### **1.3. Methodology/ Arguments:**

The paper uses a scientific method to prove its ideas about detecting sarcasm. The goal of Sarcasm Detection (SD) is to introduce a sarcasm detector capable of distinguishing whether a text sample belongs

to sarcasm or not. Each training sample is represented as  $(s_i, y_i)$ , where  $s_i$  is the raw text, and  $y_i \in Y$ , where  $Y$  is the category label, with  $Y = \{\text{sarc}, \text{non-sarc}\}$ . COMET (Common-sense Knowledge Graph Embeddings for Transformer) is a pre-trained common-sense reasoning tool, which can infer various kinds of common-sense relations associated with the related event of a given text.

The paper argues for introducing and validating a ground-breaking sarcasm detection method called SD-APRR. It stated that the existing approaches to identifying sarcasm face challenges in capturing the intricate nuances of sarcastic expressions accurately. To address this issue, the authors propose SD-APRR, highlighting its distinctive features. The key components here are Event-augmented samples, integrating potential results and human reactions, to improve the comprehension of implied negative situations in sarcastic text. Additionally, for each event-augmented sample, they transform it into a dependency graph  $G_i$  and encode the undirected graph as the sample embedding using the Masked graph-based encoder.

The paper supports its argument through a meticulous imperial evaluation, conducting experiments on benchmark datasets. Benchmark datasets are chosen to evaluate SD-APRR ensuring diversity and representativeness of sarcastic expressions. SD-APRR is systematically compared with existing baselines and traditional methods forming a basis for evaluating its performance. NBOW, Bi-LSTM, SIARN, and SAWS, are some of the baseline methods used for comparison. Extensive experiments were conducted on the selected datasets using evaluation metrics such as Accuracy and Macro-F1 score to quantitatively assess the performance of SD-APRR. The empirical evidence derived from the experiments suggests that it is a foundation for the scientific credibility of the claims.

## 1.4. Conclusion:

The paper introduces a new sarcasm detection method called SD-APRR. It uniquely uses potential results and human reactions related to events to create augmented samples using the COMET tool. These samples are treated as sarcastic texts. The paper emphasizes the effectiveness of SD-APRR through experiments, comparing its performance to existing methods.

The proposed SD-APRR consistently achieves the highest Accuracy and Macro-F1 scores across various datasets, outperforming other methods like SemEval18, iSarcasm, and IAC-V2. SD-APRR often surpasses the strong baseline SarDeCK, indicating that the direct access view treating augmentations and common-sense results as raw texts maybe a more effective perspective for sarcasm detection. In comparison to ADGCN, SD-APRR demonstrates significant improvements across all datasets. Also, SD-APRR consistently outperforms methods without external resources i.e., understanding sarcasm is heavily reliant on human background information.

The authors acknowledge limitations like the focus on social media datasets and suggest a methodology for sarcasm detection. If the proposed method consistently outperforms existing approaches and proves practical, it might prompt a reconsideration of standard practices. Yet, community consensus and validation through subsequent studies are essential for any potential changes. The paper demonstrates the effectiveness of SD-APRR across diverse datasets and linguistic contexts so it suggests a higher degree of generalizability. This implies that the findings could be applied to various areas within the field of natural language processing, extending beyond the specific datasets and contexts investigated in the paper. If the datasets are highly specific or biased, it may limit the generalizability of the results to broader applications. The open problems highlighted in the paper include the need for more diverse datasets extending beyond social media and a need to explore alternative theories of sarcasm beyond the mainstream incongruity theory.

## **2. Critique:**

The research paper, “Just Like a Human Would, Direct Access to Sarcasm Augmented with Potential Result and Reaction”, addresses the challenging task of sarcasm detection in social media, particularly on platforms like Twitter and Weibo. The paper effectively highlights the widespread use of sarcasm in online communication.

### **2.1. Limited Exploration of Common-Sense Reasoning Tools:**

The paper demonstrates how the performance the proposed approach is better than various traditional Sarcasm Detection methods. The experimental results presented in the paper show that SD-APRR consistently outperforms existing baselines and traditional methods. Notably, it achieves the highest scores in both accuracy and Macro-F1 scores across diverse settings. The empirical evidence presented in the results section reinforces the claim that SD-APRR is a robust and competitive method in the realm of sarcasm detection, showcasing its potential for practical applications and advancements in the field.

The paper's somewhat limited exploration of common-sense reasoning tools raises a few noteworthy concerns. While the paper introduces COMET as a common-sense reasoning tool, it does not thoroughly explore alternative tools or discuss the comparative advantages and disadvantages of different options. Common-sense reasoning encompasses various established tools like ConceptNet, ATOMIC, and TransOMCS, each with distinct features.

The absence of a comprehensive discussion comparing the strengths and limitations of different common-sense reasoning tools leaves readers wondering why COMET was deemed the most suitable for the proposed sarcasm detection method. A more thorough exploration of these tools would have provided a clearer understanding of the authors' rationale and allowed readers to better appreciate the method's strengths. Offering a comparative analysis of different tools would fortify the paper's argument, showcasing why COMET was chosen over other options and whether its performance remains consistent across diverse scenarios. This would provide a more nuanced understanding of the methodological choices made by the authors. Additionally, assessing the proposed method's performance against other tools could have offered valuable insights into its adaptability and generalizability across diverse common-sense reasoning frameworks.

### **2.2. Neglect of Generalization and Alternative Sarcasm Theories**

The introduction of SD-APRR, a novel method incorporating potential results and human reactions through the COMET tool, shows creativity. The addition of a graph-based encoder, along with a denoising module, improves upon traditional text-based approaches. The proposed method demonstrates competitive performance, but a more profound exploration of practical applications, scalability, dataset biases, and generalizability would enhance the paper's overall contribution. A more comprehensive discussion on the implications and extensions of SD-APRR would benefit the research community.

The paper shows that the traditional methods cannot fully understand the negative situation due to its implicit nature. To resolve this issue, SD-APRR employs external resources to capture negative situations and further incongruities of sarcastic texts. The methodology used is strong, defining the goal of Sarcasm Detection (SD) and employing the COMET tool for common-sense reasoning. The authors could enhance their argument by delving into alternative theories, providing a more comprehensive understanding of sarcasm's multifaceted nature. This exploration would contribute to addressing potential limitations associated with a singular reliance on the incongruity theory.

## 2.3. Limited Dataset Diversity

The contributions made by the paper are noteworthy. A notable critique of the paper lies in its somewhat limited dataset diversity, primarily focusing on social media datasets. The paper acknowledges this limitation, indicating that datasets collected from social media platforms like Twitter and Weibo constitute the primary data source for evaluating the proposed sarcasm detection method, SD-APRR. Sarcasm manifests differently across various contexts, including literature, films, formal documents, and everyday conversations. Relying predominantly on social media datasets might result in a method that is tailored to the characteristics of online communication but lacks adaptability to broader linguistic contexts. While these platforms offer a glimpse into real-world sarcastic expressions, there's a risk of introducing bias specific to online communication. The omission of diverse datasets could potentially lead to a biased evaluation and hinder the method's applicability in real-world scenarios beyond the scope of social media.

To strengthen the research findings, it would be beneficial for the authors to incorporate datasets from a more varied set of sources. This would not only enhance the method's reliability across different linguistic styles but also contribute to a more comprehensive understanding of sarcasm in diverse communication channels. The method's effectiveness should be validated across a more diverse range of contexts, including literature, movies, or various cultural sources. This would provide a more comprehensive evaluation, ensuring the proposed approach's applicability beyond specific social media environments.

### **3. Synthesis:**

The main issue tackled in this research is the accurate identification of sarcasm, particularly in the realm of social media like Twitter and Weibo. The authors stress the difficulty of sarcasm, where negative sentiments are expressed through seemingly positive words, posing a challenge for current methods. The authors state that sarcasm detection could be possibly done accurately if we have an idea of the context or background information. To address this, the paper introduces SD-APRR, a new method that uses event-augmented samples created with the COMET tool, incorporating external knowledge for better sarcasm detection.

#### **3.1. Exploring Alternatives and Strengthening the Approach**

There are various other ways to detect sarcasm, ranging from traditional rule-based methods to modern neural network approaches. These alternatives focus on different aspects, such as sentence structures, emotional word lists, or embeddings. To back the authors' claims, exploring other pre-trained models like COMET or knowledge sources for common-sense reasoning could provide more insights into the effectiveness of SD-APRR.

To support the research findings, the authors could conduct experiments on a broader range of datasets. Exploring other sarcasm theories beyond the conventional incongruity theory might offer a more complete understanding, addressing potential limitations tied to a single theoretical view. Additionally, examining different pre-trained models or knowledge sources for common-sense reasoning could strengthen the proposed method's reliability.

#### **3.2. Generalizability and Open Problems**

A counterargument could question the method's generalizability, especially given the heavy reliance on social media datasets. Limitations tied to these datasets, such as biases and specific language patterns, should be directly addressed. The application of the research findings to other contexts depends on SD-APRR's generalizability. If proven effective across diverse datasets and linguistic contexts, this method could be applied beyond social media, contributing to a broader understanding of sarcasm in different communication settings.

The paper highlights open issues, including the need for more diverse datasets and the exploration of alternative sarcasm theories. The implicit suggestion of reconsidering standard practices in sarcasm detection underscores the importance of community agreement and further validation through subsequent studies.

If I were to approach this research differently, I would experiment with various common-sense reasoning tools beyond COMET and explore datasets from various sources for a more comprehensive evaluation. Including alternative sarcasm theories in the methodology could offer a more well-rounded understanding, addressing potential limitations associated with a single theoretical perspective. Additionally, examining the impact of cultural and contextual variations on sarcasm detection could contribute to a more nuanced analysis.