

Leveraging Artificial Intelligence for Enhanced Linguistic Analysis: A Deep Learning Approach to Language Understanding

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ABSTRACT

The integration of Artificial Intelligence (AI) into the field of linguistics has catalysed unprecedented advancements, particularly through the application of deep learning algorithms in Natural Language Processing (NLP). This paper investigates contemporary AI-driven methodologies for linguistic analysis, emphasizing the transformative impact of deep learning models on tasks such as language modeling, semantic analysis, and syntactic parsing. By leveraging state-of-the-art transformer architectures, we assess their efficacy in capturing the multifaceted nature of human language, including phenomena such as polysemy, syntactic variability, and discourse structures. Our research employs a comparative analysis of various AI models, evaluating their performance across diverse linguistic datasets to elucidate their strengths and limitations in language understanding tasks. Furthermore, we explore the implications of these advancements for computational linguistics, highlighting how AI can enhance both theoretical frameworks and practical applications, including machine translation, sentiment analysis, and the development of conversational agents. Despite the transformative potential of AI in linguistics, our findings underscore critical challenges, particularly concerning model interpretability and the nuanced replication of human context. This study contributes to the ongoing discourse on the development of more effective AI methodologies, advocating for the integration of AI tools in the pursuit of understanding and preserving linguistic diversity. By addressing these challenges, we aim to foster a more profound engagement with the complexities of human language through AI-enhanced linguistic research.