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AI-Based Techniques for Online Social Media Network Sentiment Analysis: A Methodical Review

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Abstract : Online social media networks have long served as a primary arena for group conversations, gossip, text-based information sharing and distribution. The use of natural language processing techniques for text classification and unbiased decision-making has not been far-fetched. Proper classification of this textual information in a given context has also been very difficult. As a result, we decided to conduct a systematic review of previous literature on sentiment classification and AI-based techniques that have been used in order to gain a better understanding of the process of designing and developing a robust and more accurate sentiment classifier that can correctly classify social media textual information of a given context between hate speech and inverted compliments with a high level of accuracy by assessing different artificial intelligence techniques. We evaluated over 250 articles from digital sources like ScienceDirect, ACM, Google Scholar, and IEEE Xplore and whittled down the number of research to 31. Findings revealed that Deep learning approaches such as CNN, RNN, BERT, and LSTM outperformed various machine learning techniques in terms of performance accuracy. A large dataset is also necessary for developing a robust sentiment classifier and can be obtained from places like Twitter, movie reviews, Kaggle, SST, and SemEval Task4. Hybrid Deep Learning techniques like CNN+LSTM, CNN+GRU, CNN+BERT outperformed single Deep Learning techniques and machine learning techniques. Python programming language outperformed Java programming language in terms of sentiment analyzer development due to its simplicity and AI-based library functionalities. Based on some of the important findings from this study, we made a recommendation for future research.

Keywords : artificial intelligence, natural language processing, sentiment analysis, social network, text
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