**An Improved Heuristic Algorithm-assisted Multi-scale Feature Fusion based Adaptive and Attention based CNN for Sentiment Analysis**

**Abstract**

Social media is a powerful source of communication among people to share their sentiments in the form of opinions and views about any topic or article, which results in an enormous amount of unstructured information. Business organizations need to process and study these sentiments to investigate data and to gain business insights. In this regard, the sentiment analysis appeared to be an important tool that allows the automation of getting insight from the user-generated data. Recently, deep learning approaches have been proposed for different sentiment analysis tasks and have achieved state-of-the-art results. Sentiment analysis is referred as text organization that is used to classify the expressed mind-set or feelings in different manners such as negative, positive, favorable, unfavorable, thumbs up, thumbs down, etc. The challenge for sentiment analysis is lack of sufficient labeled data in the field of Natural Language Processing (NLP). Hence, to analyze these sentiments, various machine learning, and natural language processing-based approaches have been used in the past. However, deep learning-based methods are becoming very popular due to their high performance in recent times. To surmount such existing issues, an adaptive and attention deep learning model is proposed using improved heuristic approach. Initially, the input text data will be collected from the online public resources. Further, it will be followed by text pre-processing to remove the unwanted text data. Further, the pre-processed text will be fed into the Multiscale Feature Fusion based Adaptive and Attention based Convolution Neural Network (CNN). In this proposed model, the features will be extracted from Bidirectional Encoder Representations from Transformers (BERT), transformer and word2vector. Then, the resultant features will be fused together and it will be subjected into the Adaptive and Attention based CNN, where the sentiment will be analyzed. Also, the parameter tuning will be done by improved Rat Swarm Optimizer (RSO) [1]. Finally, the performance evaluation of the model is done to provide the outstanding results. The proposed work outperforms with the better performance in identifying the various sentiments of people.

**References**

1. Gaurav Dhiman, Meenakshi Garg, Atulya Nagar, Vijay Kumar and Mohammad Dehghani, "A novel algorithm for global optimization: Rat Swarm Optimizer", Journal of Ambient Intelligence and Humanized Computing, Vol. 12, pp. 8457–8482, 2021.