

(12) PATENT APPLICATION PUBLICATION

(21) Application No.202541105603 A

(19) INDIA

(22) Date of filing of Application :31/10/2025

(43) Publication Date : 28/11/2025

(54) Title of the invention : Emotion Classification in Software Engineering Texts using Multi-Scale Context-Aware Transformer

(51) International classification	:G06F0040300000, G06N0003045000, G10L0025630000, G06N0003080000, G06F0040284000	(71)Name of Applicant : 1)R.V.R. & J.C. COLLEGE OF ENGINEERING Address of Applicant :R.V.R. & J.C. COLLEGE OF ENGINEERING, CHOWDAVARAM – 522 019. Chowdavaram Andhra Pradesh India
(31) Priority Document No	:NA	(72)Name of Inventor : 1)Dr. A. Sri Nagesh
(32) Priority Date	:NA	2)Vajja Siva Sai
(33) Name of priority country	:NA	3)Rayidi Meghana
(86) International Application No	:	
Filing Date	:01/01/1900	
(87) International Publication No	: NA	
(61) Patent of Addition to Application Number	:NA	
Filing Date	:NA	
(62) Divisional to Application Number	:NA	
Filing Date	:NA	

(57) Abstract :

ABSTRACT [0012] Emotion classification in software engineering texts is essential for understanding developer sentiment, enhancing collaboration, and supporting emotional well-being on platforms like GitHub, Stack Overflow, and Jira. Although transformer-based models such as BERT, RoBERTa, DeBERTa, CodeBERT, and GraphCodeBERT have advanced text analysis in this domain, they struggle to interpret implicit sentiments, emoji-driven expressions, and the nuanced context of technical communication. To address these limitations, this research introduces the Multi-Scale Context-Aware Transformer (MS-CAT), a novel model designed to improve multimodal emotion classification in developer discourse. MS-CAT leverages multi-scale attention mechanisms and integrates both textual and emoji embeddings to capture a broader range of emotional cues. [0013] By combining contrastive learning with fine-tuned attention over software engineering specific datasets, the proposed framework adapts more effectively to domain-specific language and emotive patterns. Evaluation results show that MS-CAT achieves an accuracy of 86%, significantly outperforming several existing transformer-based models in emotion recognition tasks. The model's architecture is optimized to capture both local and global contextual information, making it particularly well-suited for analyzing developer interactions that are brief, ambiguous, or contain informal emotional expressions. The findings demonstrate the potential of MS-CAT for real-time sentiment analysis, automated emotion monitoring, and improved communication in developer environments. This project work contributes to the growing field of affective computing in software engineering by offering a robust, context aware solution tailored to the unique challenges of technical communication, and it opens avenues for integrating emotional intelligence into collaborative development tools and platforms.

No. of Pages : 8 No. of Claims : 6