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Integrating RAG with Prompt Engineering for Dynamic Log Parsing and Anomaly Detections

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Abstract : With the increasing complexity of systems, log parsing and anomaly detection have become crucial for maintaining system stability. However, traditional methods often struggle with adaptability and accuracy, especially when dealing with rapidly evolving log content and unfamiliar domains. To address these challenges, this paper proposes approach that integrates Retrieval Augmented Generation (RAG) technology with Prompt Engineering for Large Language Models, applied specifically in LogPrompt. This approach enables dynamic log parsing and intelligent anomaly detection by combining real-time information retrieval with prompt optimization. The proposed method significantly enhances the adaptability of log analysis and improves the interpretability of results. Experimental results on several public datasets demonstrate the method's superior performance, particularly in scenarios lacking training data, where it significantly outperforms traditional methods. This paper introduces a novel technical pathway for log parsing and anomaly detection, showcasing the substantial theoretical value and practical potential.

Keywords : log parsing, anomaly detection, RAG, prompt engineering, LLMs
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