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Artificial Intelligence for Intelligent Monitoring and Self-Healing of Cloud-Based Software Applications

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Abstract: *Cloud-based software applications are essential for modern businesses, offering scalability, flexibility, and global accessibility. However, they face challenges such as unpredictable workloads, performance degradation, and system failures, which can affect reliability and user experience. Traditional monitoring and maintenance approaches require significant manual intervention, leading to delays and increased operational costs. Artificial Intelligence (AI) provides a solution by enabling intelligent monitoring and self-healing capabilities. AI-driven systems can analyze performance metrics, logs, and user behavior in real-time to detect anomalies, predict potential failures, and optimize resource allocation. Furthermore, self-healing mechanisms allow these systems to autonomously diagnose and resolve issues—such as restarting services, migrating workloads, or applying patches—without human intervention. Integrating AI into cloud applications enhances system resilience, reduces downtime, and improves overall operational efficiency. This study focuses on designing and implementing AI-based frameworks for intelligent monitoring and self-healing of cloud-based software, highlighting the potential for more reliable, adaptive, and cost-effective cloud ecosystems.*

Keywords: Artificial Intelligence, Cloud Computing, Intelligent Monitoring, Self-Healing Systems, Anomaly Detection

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