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A Deep Learning-Based Interruption Discovery Framework for Software-Defined Networks

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Abstract: *The complexity and dynamic nature of software-defined networks (SDNs) have made it increasingly difficult to identify and mitigate network outages. Due to SDNs' scale and unpredictability, traditional interruption detection techniques frequently suffer, which impairs performance and increases downtime. In order to tackle these issues, a deep learning-based approach is put forth in this research. Our system employs sophisticated neural network architectures to evaluate large amounts of network traffic data and find patterns suggestive of disruptions. By combining CNNs and RNNs, the system can better detect interruptions than it could with traditional methods since it can capture temporal and geographical relationships in the data.*

Our comprehensive tests on real-world SDN settings show that the suggested framework performs better than conventional approaches in terms of computing efficiency, false positive rates, and detection accuracy. The deep learning-based method makes the SDN management system more durable and responsive while also increasing the accuracy of interruption detection. This work highlights the possibility of techniques to improve network disruption detection and ultimately create more durable and dependable SDN networks.

Keywords: Network traffic analysis, anomaly detection, network resilience, data-driven framework, performance optimization, deep learning, interruption detection, convolutional neural networks (CNNs), recurrent neural networks (RNNs), and software-defined networks (SDNs)

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