

Securing the Cloud: A Machine Learning Approach for Threat Detection and Mitigation

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Abstract: *As cloud computing continues to play an increasingly integral role in modern IT infrastructures, ensuring the security of cloud environments has become paramount. Leveraging machine learning techniques presents a promising avenue for enhancing cloud security by enabling proactive threat detection and mitigation. In this paper, we present a comprehensive framework for the application of machine learning in cloud security. We begin by collecting and preprocessing data related to machine learning applications in cloud security, followed by the application of various algorithms such as Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), and Long Short-Term Memory (LSTM) on the dataset. Performance evaluation metrics including accuracy and precision are utilized to compare the effectiveness of these algorithms in threat detection. Our results indicate that CNN outperforms other algorithms in terms of accuracy and precision. Furthermore, we propose future enhancements to the framework, including the integration of ensemble methods, advanced feature engineering, and deployment of federated learning, to further enhance cloud security. This framework provides a robust foundation for leveraging machine learning to address the evolving challenges of securing cloud environments effectively.*

Keywords: Cloud Security, Machine Learning, Convolutional Neural Networks, Recurrent Neural Networks, Long Short-Term Memory, Threat Detection.