AI- Driven Security in Cloud Computing (Enhasing Threat Detection, Automated Response, and Cyber Resilience)

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Abstract: *Cloud computing faces growing cyber threats like misconfigurations, insider attacks, and ransomware. Traditional static security methods fail against evolving attacks. AI enhances cloud security through anomaly detection, deep learning, predictive threat modeling, and automated incident response Cloud security concerns have been greatly realized in recent years due to the increase of complicated threats in the computing world. Many traditional solutions do not work well in real-time to detect or prevent more complex threats. Artificial intelligence is today regarded as a revolution in determining a protection plan for cloud data architecture through machine learning, statistical visualization of computing*

infrastructure, and detection of security breaches followed by counteraction.

These AIenabled systems make work easier as more network activities are scrutinized, and any anomalous behavior that might be a precursor to a more serious breach is prevented. This paper examines ways AI can enhance cloud security by applying predictive analytics, behavior-based security threat detection, and AI-stirring encryption. It also outlines the problems of the previous security models and how AI overcomes them

As a similar reason, issues like data privacy, biases in the AI model, and regulatory compliance are also covered. So, AI improves the protection of cloud computing contexts; however, more efforts are needed in the subsequent phases to extend the technology's reliability, modularity, and ethical aspects. This means that AI can be blended with other new computing technologies, including blockchain, to improve security frameworks further. The paper discusses the current trends in securing cloud data architecture using AI and presents further research and application directions

Keywords: AI-Powered Security; CybersecurityThreats; machinelearning; Anomaly Detection; Threat Intelligence; Automated Security Response