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AI-Driven Solutions for Detecting and Mitigating Cyber Threats on Social Media Networks

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Abstract: *Cybersecurity has emerged as a vital aspect of organisations' operation because of the increased usage of technology and the internet, and an increase in callous and legal cybercrimes. Therefore, understanding and managing cyber threats has become an essential component of modern cyber architectures in order to provide protection and sustain technology assets and offerings against ever-involving cyber threats. The purpose of this article is to highlight the importance of vulnerability information analysis and cyberthreats in order to proactively comprehend cyber risks and anomalies and provide suitable mitigation techniques. The current research provides the prospect of an improved approach for responding to cyber threats on social media networks based on AI and machine learning. Leveraging the CIC-IDS2017 dataset. Data using text-based features, like user behaviour and network activity, are then preprocessed and feature-engineered, for instance, by means of one-hot encoding. Classification models such as LSTM, GNB, and LDA were used to group various cyber hazards, such as malware propagation, into distinct groups. Thus, the LSTM reveals its high potential in real-time threat identification in terms of an accuracy of 99.34%, recall of 99%, precision of 99.3%, and an F1-score of 99.34%. However, it reveals that GNB and LDA have lower accuracy and classification measures compared to other algorithms. In case of threat identification, the process of counteraction is also performative immediately as users are informed and accounts are blocked additionally to informing the admins. This framework provides a sound approach to improve the cybersecurity on social media websites.*

Keywords: Cyber security, Threat detection, mitigating threats, social networks, LSTM, machine learning