

ADVANCED TECHNIQUES IN MONITORING AND DETECTING SECURITY THREATS IN ENGINEERING SYSTEMS

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ABSTRACT

In today's rapidly evolving technological landscape, engineering systems face an increasing array of security threats that can compromise their integrity, functionality, and data. As such, the need for advanced techniques in monitoring and detecting security threats has become paramount. This paper explores cutting-edge methods and frameworks for enhancing the security of engineering systems through real-time monitoring, anomaly detection, and predictive threat analysis. By leveraging advanced machine learning algorithms, artificial intelligence (AI), and big data analytics, modern systems can identify potential vulnerabilities and respond to security incidents faster and more accurately. Key techniques discussed include intrusion detection systems (IDS), behavioral analysis, and threat intelligence platforms that help engineers proactively mitigate risks. Furthermore, this paper examines the integration of these techniques with existing engineering infrastructure, emphasizing their role in preventing cyber-attacks and ensuring system resilience. The integration of continuous monitoring, automated response mechanisms, and the use of AI-driven models for pattern recognition have shown significant promise in detecting both known and emerging threats. Additionally, the role of human expertise remains crucial in fine-tuning these technologies and ensuring their effectiveness. By combining these advanced approaches, organizations can improve the security posture of their engineering systems, reducing the risk of data breaches, system failures, and other security incidents. This paper highlights the importance of a multi-layered defense strategy and offers insights into the future of security in engineering systems, where technology and human oversight work together to create a robust and adaptive security framework.

KEYWORDS: *Advanced Monitoring, Security Threat Detection, Engineering Systems, Machine Learning, Anomaly Detection, Intrusion Detection Systems, Predictive Threat Analysis, Artificial Intelligence, Cybersecurity, Behavioral Analysis, Threat Intelligence, Real-Time Monitoring, Automated Response, System Resilience, Multi-Layered Defense Strategy*

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