

# Leveraging Artificial Intelligence for Enhancing Cybersecurity: A Comprehensive Review and Analysis

Sunit Jana, Rakhi Biswas, Chandrima Banerjee, Tushar Patra, Mrinmoy Pal, Koushik Pal

Department of Electronics & Communication Engineering  
Guru Nanak Institute of Technology, Kolkata, India

**Abstract:** *The development of AI technology has had a big impact on a lot of different areas, cybersecurity included. Because cyber attacks are becoming more sophisticated and complicated, traditional security measures are not working as well as they should to reduce risks. As a result, businesses are using AI-driven solutions more frequently to strengthen their cybersecurity posture. This article offers a thorough examination and analysis of artificial intelligence's position in cybersecurity, looking at its uses, difficulties, and potential future prospects. This paper explains how artificial intelligence (AI) may supplement conventional security measures, improve threat detection, and enable proactive defensive mechanisms through an analysis of AI techniques like machine learning, natural language processing, and anomaly detection. Furthermore, the article addresses privacy issues, ethical issues, and other barriers related to the use of AI in cybersecurity. Lastly, it highlights the necessity for cooperation between academia, business, and government in order to effectively use AI for protecting digital assets and guaranteeing cyber resilience. It also outlines future research possibilities in this area.*

**Keywords:** Artificial Intelligence, Cybersecurity, Machine Learning, Threat Detection, Anomaly Detection, Ethical Considerations, etc.