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CUTTING EDGE TECHNOLOGIES IN CYBER SECURITY



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INDEX

S.No	Title and Author's Details	Page No
1	**Cyber Security and Data Protection: Mitigating Risks in The Digital Age** *Saju Mathew and Navaneethi B*	1-13
2	**Comprehensive Understanding of Zero Trust Architecture** *R.Shanthi and S.Sabaria*	14-30
3	**Cybersecurity for The Internet of Things (IoT)** *K.A Varsitha and M. Jaithoon Bibi*	31-49
4	**Cybersecurity for The Internet of Things** *Ashlesha Deole, Chaitanya Koleshwar and Varsha Bhagwat[1]*	50-52
5	**Next-Generation Cybersecurity Innovations for A Resilient Digital Future** *Jayalakshmi.V and Jagadeshkumar.S*	53-60
6	**Evolution of Women's Property Rights in India** *K. Neela Pushpam*	61-74
7	**Comparative Analysis of Multi-Factor Authentication Using Keystroke Dynamics and Facial Recognition with Gait Biometrics** *Jishnu Prasad and Mary Amala Bai V*	75-86
8	**Cybersecurity for The Internet of Things(IoT)** *P.Thenmozhi and S.Habarnika*	87-98
9	**Artificial Intelligence and Machine learning in Cyber Security** *M.Meena Krithika*	99-106
10	**Zero Trust Architecture (ZTA)** *Poonam Karale and Anita Chaware*	107-119
11	**Advanced Technologies in Cybersecurity: AI and ML** *Jayashri S. Lokhande*	120-126
12	**Digital Forensics in The Nupur Talwar Case: A Technical Analysis** *Ekant Yadav, Anshul Gautam and Ritinder Kaur*	127-137
13	**Application of AI and IoT: Revolutionizing Banking Cyber Security for Enhanced Threat Detection and Fraud Prevention** *D. Padma, M. Dhavapriya*	138-149
14	**A Hybrid AI-Based Framework for Real-Time Cybersecurity Attack Detection Using GANs, HANs, And GTLSTM** *Leena S Watson and A.Anitha*	150-164

Chapter : 9

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING IN CYBER SECURITY

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ABSTRACT

Artificial Intelligence (AI) is revolutionizing cybersecurity by integrating technologies like machine learning (ML), neural networks, and Large Language Models (LLMs) into security frameworks. Unlike traditional rule-based systems, AI analyzes vast data, learns from experience, and adapts to evolving threats, offering enhanced speed and accuracy in threat detection, management, and response. Key merits include improved threat intelligence, faster incident response, superior vulnerability management, and predictive breach risk assessment. Specific AI technologies such as ML—encompassing supervised, unsupervised, and reinforcement learning—Deep Learning for complex pattern recognition, and LLMs for advanced text analysis are pivotal. Recent advancements include AI-powered remediation, generative AI for enhanced threat intelligence, and sophisticated threat deception tactics. As AI evolves, it promises greater defensive capabilities while also posing new challenges from AI-driven attacks, necessitating continuous innovation.

Keyword : Cyber security, Flagging potential, Large Language Models, Neural Networks

INTRODUCTION

AI in cyber Security integrates artificial intelligence technologies, such as machine learning and neural networks, into security frameworks. These technologies enable cyber security systems to analyze vast amounts of data, recognize patterns, and adapt to new and evolving threats with minimal human intervention. Unlike traditional cyber security tools, which rely on predefined rules to detect threats, AI-driven systems learn from experience, allowing them to predict, detect, and respond more effectively to known and unknown threats.. AI is evolving in three main stages:

a) **Assisted intelligence**: Enhances what people and organizations already do today.
b) **Augmented intelligence**: Enables new capabilities, allowing people to perform tasks they couldn't do before.
c) **Autonomous intelligence**: Future technology where machines will act independently, like self-driving cars.

AI offers a solution to these challenges