

ARTIFICIAL INTELLIGENCE IN DIGITAL SECURITY AND CYBERSECURITY

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Annotatsiya. Ushbu maqolada raqamli infratuzilmaning jadal kengayishi kiberxavfsizlikning xavf-xatarlari va zaifliklarini sezilarli darajada oshganligi, an'anaviy xavfsizlik mexanizmlari endi murakkab raqamli muhitni murakkab kiber tahdidlardan himoya qilish usullari keltirilgan bo'lib, ularni sun'iy intellekt (AI) yordamida raqamli xavfsizlik va kiberxavfsizlikda transformatsion texnologiya sifatida paydo bo'lishi, tahdidlarni aqlli aniqlashi, avtomatlashtirilgan javob berishi va xavflarni bashoratli boshqarish imkonini berishi haqida fikr yuritilgan bo'lib, raqamli xavfsizlik tizimlarini takomillashtirishda sun'iy intellektning o'rni har tomonlama tahlil qilingan.

Kalit so'zlar. Tadqiqot AI modellari, mashinani o'rganish algoritmlari, chuqur o'rganish yondashuvlari, zararli dasturlar.

The study explores AI models machine learning algorithms, deep learning approaches, and their input detection, and the use of malware.

Digital security and cybersecurity have become critical concerns in the era of digital transformation. Governments, enterprises, and individuals increasingly rely on digital systems, cloud platforms, and interconnected networks. This dependency has led to a surge in cyberattacks, including ransomware, phishing, distributed denial-of-service attacks, and data breaches. Artificial intelligence offers intelligent, adaptive, and scalable solutions for addressing modern cybersecurity challenges.

Digital security refers to the protection of digital data, systems, and networks from unauthorized access, manipulation, or destruction. Cybersecurity is a broader concept encompassing technologies, processes, and practices designed to defend digital environments against cyber threats. Effective cybersecurity ensures confidentiality, integrity, and availability of information.

Artificial intelligence enhances cybersecurity by enabling systems to analyze vast volumes of data, recognize anomalies, and respond to threats in real time. AI-

based systems learn from historical attack patterns and continuously adapt to emerging threats, significantly improving detection accuracy and response speed.

Table 1. AI technologies used in cybersecurity.

AI Technology	Function	Cybersecurity Application
Machine Learning	Pattern learning	Intrusion detection
Deep Learning	Complex pattern recognition	Malware detection
Neural Networks	Behavior analysis	Anomaly detection
Natural Language Processing	Text analysis	Phishing detection

AI-driven threat detection systems monitor network traffic, user behavior, and system logs to identify malicious activities. Unlike traditional signature-based systems, AI models detect zero-day attacks and unknown threats using anomaly detection techniques.

Artificial intelligence significantly improves malware detection by analyzing file behavior rather than relying solely on known signatures. Deep learning models classify malicious software with high accuracy, reducing false positives and enabling faster response times.

Table 2. Comparison of traditional and ai-based security systems

Criteria	Traditional Systems	AI-Based Systems
Detection Method	Rule-based	Learning-based
Adaptability	Low	High
Zero-day Attack Detection	Limited	Effective
Response Time	Slow	Real-time

AI is widely used in detecting financial fraud, identity theft, and unauthorized access. Machine learning algorithms analyze user behavior patterns to identify suspicious activities and prevent fraudulent transactions.

Despite its effectiveness, AI in cybersecurity raises ethical and legal concerns, including data privacy, algorithmic bias, lack of transparency, and accountability in

automated decision-making. Addressing these issues requires regulatory frameworks and explainable AI models.

Future research focuses on explainable AI, autonomous cyber defense systems, quantum-resistant security algorithms, and collaborative AI models that share threat intelligence across platforms.

Artificial intelligence has become an indispensable tool in digital security and cybersecurity. Its ability to detect threats, analyze complex data, and automate defense mechanisms significantly enhances cyber resilience. Continued research and responsible implementation will ensure secure and trustworthy digital environments.

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