


Chapter 13


Role of Artificial Intelligence and Blockchain on Cyber Security: A PRISMA–Compliant Systematic Literature Review

Juhi P. Pathak

 <https://orcid.org/0000-0002-8028-1556>

Amity University, Noida, India

Kriti Singh

 <https://orcid.org/0000-0002-0093-6971>

Amity University, Noida, India

Swarnendu Roy

GD Goenka University, Sohna, India

ABSTRACT

This chapter explores the integration of artificial intelligence (AI) and blockchain technologies in enhancing cybersecurity through a PRISMA-compliant systematic literature review. It reviews key studies, highlighting various AI techniques such as expert systems, neural networks, and machine learning algorithms used for intrusion detection, malware monitoring, and decision support. The advantages of AI, including early intrusion prevention and enhanced decision-making, are discussed alongside challenges like bias and security threats. Additionally, the role of blockchain in securing IoT, data privacy, and network security is examined. The chapter

DOI: 10.4018/979-8-3693-6537-3.ch013

concludes by emphasizing the promising future of AI and blockchain in defending against sophisticated cyber threats while acknowledging the need for broader research and policy frameworks.

INTRODUCTION

The 21st century has seen an exponential rise in technological discoveries. One of the most important of them is the Internet. The ever-rising speed of connectivity has led to the creation of an altogether different realm, and this realm is known as 'cyberspace'. Cybersecurity, elementarily, can be defined as the process of securing this cyberspace. The need to secure this cyberspace has led to various further research. Two elements that have bolstered the methods and results of cybersecurity are 'Artificial Intelligence and Blockchain'. With digitisation's tremendous power, all data has become binary and is getting stored on hard disk drives and clouds. Gone are the days of paper files, notebooks, etc. This has its inherent advantage of easy accessibility of data, but it is also dangerous, as now the stealing of this data is also easier. Data has now become the most critical asset. With a networked environment, the world has gone for paperless transactions. The banking and finance sector today is entirely paperless. However, these networks are also susceptible and prone to cyberattacks.

With each technological development, some vulnerabilities always get created. Cybersecurity is the process of plugging these vulnerabilities into cyberspace. At times, it is also exploiting the vulnerabilities of the adversary in cyberspace. Artificial Intelligence (AI) and blockchains are two emerging technologies that enhance the cybersecurity process. This chapter entails discussing the role AI and blockchain play in the domain of cybersecurity. The article applies the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) model of systematic literature review and has reviewed the academic papers of the last ten years.

BACKGROUND

Artificial Intelligence and Cyber Security

In the field of cyber security, AI has a lot of promises. The goal of cybersecurity is to keep networks and systems operational in the face of assault and compromise. By improving awareness and reacting to threats and changes in the environment at near-wire speed, AI has the ability to significantly advance these aims. Such advancements offer a significant chance to change the attacker-versus-defender

32 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/role-of-artificial-intelligence-and-blockchain-on-cyber-security/356706

Related Content

Combining Clustering and Factor Analysis as Complementary Techniques

Lakshmi Prayaga, Krishna Devulapalliand Chandra Prayaga (2020). *International Journal of Data Analytics* (pp. 48-57).

www.irma-international.org/article/combining-clustering-and-factor-analysis-as-complementary-techniques/258920

An Innovative Approach to Solve Healthcare Issues Using Big Data Image Analytics

Ramesh R., Udayakumar E., Srihari K.and Sunil Pathak P. (2021). *International Journal of Big Data and Analytics in Healthcare* (pp. 15-25).

www.irma-international.org/article/an-innovative-approach-to-solve-healthcare-issues-using-big-data-image-analytics/268415

Exploratory Data Analysis

(2018). *Spatial Analysis Techniques Using MyGeoffice®* (pp. 112-136).

www.irma-international.org/chapter/exploratory-data-analysis/189720

Entrepreneurship and Big Data

(2019). *Big Data Analytics for Entrepreneurial Success* (pp. 196-233).

www.irma-international.org/chapter/entrepreneurship-and-big-data/216187

Challenges in Clinical Data Linkage in Australia: Perspective of Spinal Cord Injury

Jane Dominique Moon, Megan Bohenskyand Mary Galea (2016). *International Journal of Big Data and Analytics in Healthcare* (pp. 18-29).

www.irma-international.org/article/challenges-in-clinical-data-linkage-in-australia/171402