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Research Article

Systematic Review Methodology

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Abstract

This article adopts a Systematic Literature Review (SLR) to examine recent advances in Artificial Intelligence (AI) for cybersecurity. The review follows a structured process for identifying, evaluating, and synthesizing published studies related to machine learning and deep learning applications in cyber threat detection.

Keywords: Artificial intelligence, Cybersecurity, Machine learning, Cyber threat detection

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Introduction

The methodology consists of the following stages:

- Definition of research questions.
- Identification of relevant literature.
- Application of inclusion and exclusion criteria.
- Quality assessment of selected studies.
- Data extraction.
- Comparative and thematic analysis.

This approach improves transparency and reduces selection bias while providing a comprehensive overview of current research.

Research questions

The review addresses the following questions:

- **RQ1:** How is AI applied in modern cybersecurity?
- **RQ2:** Which machine learning algorithms are most frequently used for cyber threat detection?
- **RQ3:** What are the strengths and weaknesses of deep learning approaches?
- **RQ4:** What challenges limit AI adoption in cybersecurity?
- **RQ5:** What future research opportunities exist?

Literature search

Relevant publications were identified from major scientific databases, including:

- IEEE Xplore
- ACM Digital Library

- SpringerLink
- ScienceDirect
- Wiley Online Library
- Google Scholar

Typical search keywords included:

- Artificial Intelligence AND Cybersecurity
- Machine Learning for Intrusion Detection
- Deep Learning Malware Detection
- AI Threat Intelligence
- Network Intrusion Detection System
- Explainable AI Security
- Cyber Threat Detection
- AI Security Operations Center

Recent peer-reviewed publications were prioritized because of the rapidly evolving nature of cybersecurity and AI technologies.

Inclusion Criteria

Studies were included if they:

- Focused on AI, machine learning, or deep learning applications in cybersecurity.
- Presented evaluation methods or comparative analyses.
- Were published in peer-reviewed journals or recognized conference proceedings.
- Were written in English.
- Addressed practical cybersecurity applications.

Exclusion Criteria

Studies were excluded if they:

- Were unrelated to cybersecurity.
- Were duplicate publications.
- Lacked sufficient technical detail.
- Were opinion articles without technical evaluation.

Table 1: Summary of review methodology.

Component	Description
Review Type	Systematic Literature Review
Publication Sources	IEEE, ACM, Springer, Elsevier, Wiley
Primary Focus	AI Applications in Cybersecurity
Analysis Method	Comparative and Thematic Analysis
Publication Language	English

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