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Patent Search

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Abstract:

The present invention introduces an advanced machine learning-based anomaly detection system tailored for network traffic analysis. Integrating feature extraction, data preprocessing, and both supervised and unsupervised learning techniques, the system continuously monitors network traffic to identify deviations from normal behavior indicative of potential threats or irregularities. Additionally, the invention offers hybrid and distributed embodiments, combining signature-based detection with machine learning and leveraging edge computing for efficient decentralized processing. With its adaptive learning capabilities and real-time monitoring, the invention provides organizations and individuals with a robust, scalable, and adaptive solution to enhance cybersecurity defenses and safeguard digital assets against a wide range of threats and vulnerabilities.

Complete Specification

Description:The present invention relates generally to the field of computer networks and cybersecurity. More specifically, the invention pertains to the detection and analysis of anomalies in network traffic using machine learning algorithms. The invention finds particular application in monitoring and securing computer networks, data centers, cloud environments, and Internet of Things (IoT) devices against unauthorized access, intrusions, and malicious activities.
BACKGROUND OF THE INVENTION
The following description of related art is intended to provide background information pertaining to the field of the disclosure. This section may include certain aspects of the art that may be related to various features of the present disclosure. However, it should be appreciated that this section be used only to enhance the understanding of the reader with respect to the present disclosure, and not as admissions of prior art.

In the realm of computer networks and cybersecurity, the detection and prevention of anomalies in network traffic have always been critical challenges. Anomalies can be indicative of malicious activities, system malfunctions, or other irregularities that could compromise the integrity, availability, and confidentiality of networked systems. As networks continue to grow in complexity and scale, the task of identifying and mitigating these anomalies becomes increasingly daunting.

Traditional methods of anomaly detection in network traffic often rely on rule-based systems, signature-based approaches, or heuristic analysis. Rule-based systems operate on predefined rules or patterns that are designed to detect specific types of anomalies. While these systems can be effective at detecting known threats and common attack vectors, they often struggle to adapt to new and evolving threats. Signature-based approaches compare network traffic against a database of known

View Application Status