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Patent Search

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Abstract:

The invention relates to a system and method of an adaptive machine learning framework tailored for real-time anomaly detection in Internet of Things (IoT) networks. The framework encompasses preprocessing incoming data streams from IoT devices, extracting relevant features to represent patterns of normal and anomalous behavior, and training an ensemble of machine learning models. These models dynamically adapt their composition based on the current state of the IoT network, aggregating their pre to generate a consolidated anomaly detection decision. By leveraging ensemble learning techniques and dynamic adaptation mechanisms, the framework achieves robust reliable anomaly detection performance in diverse and evolving IoT environments.

Complete Specification

Description: The embodiments of the present invention generally relates to the field of information technology. The invention specifically focuses on the realm of Internet of Things (IoT) networks. More specifically, it addresses the critical need for real-time anomaly detection within IoT environments. By employing an adaptive machine learning framework, the invention aims to enhance the security and reliability of IoT networks by promptly identifying and mitigating anomalous activities or behaviors.

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 recent years, the proliferation of Internet of Things (IoT) devices has led to the creation of vast interconnected networks, facilitating data exchange and enabling a wide array of applications ranging from smart homes to industrial automation. However, the decentralized and heterogeneous nature of these networks also introduces significant challenges, particularly in terms of security and reliability. Traditional security measures are often inadequate to safeguard against evolving threats, and anomalies within IoT networks can have far-reaching consequences, including data breaches, system failures, and disruptions to critical services.

Conventional approaches to anomaly detection in IoT networks typically rely on predefined rules or static models, which struggle to adapt to the dynamic nature of IoT environments and may fail to detect previously unseen anomalies. Moreover, the sheer volume and diversity of data generated by IoT devices pose significant challenges

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