

Chapter 18

Accuracy Determination: An Enhanced Intrusion Detection System Using Deep Learning Approach

Rithun Raagav

Vellore Institute of Technology, India

P. Kalyanaraman

Vellore Institute of Technology, India

G. Megala

Vellore Institute of Technology, India

ABSTRACT

The internet of things (IoT) links several intelligent gadgets, providing consumers with a range of advantages. Utilizing an intrusion detection system (IDS) is crucial to resolving this issue and ensuring information security and reliable operations. Deep convolutional network (DCN), a specific IDS, has been developed, but it has significant limitations. It learns slowly and might not categorise correctly. These restrictions can be addressed with the aid of deep learning (DL) techniques, which are frequently utilised in secure data management, imaging, and signal processing. They provide capabilities including reuse, weak transfer learning, and module integration. The proposed method increases the effectiveness of training and the accuracy of detection. Utilising pertinent datasets, experimental investigations have been carried out to assess the proposed system. The outcomes show that the system's performance is respectable and within the bounds of accepted practises. The system exhibits a 97.51% detection ability, a 96.28% reliability, and a 94.41% accuracy.

INTRODUCTION

A wide range of applications using networked telephony networks have been made possible thanks to the speed of invention. A recent study estimates that the amount of data produced by IoT systems is 2.5 quintillion bytes per day and is growing annually. The Internet of Things will be integrated into the modern network so that anybody can connect to it from anywhere and utilize smart things to monitor, compute, link, and react to numerous physical and digital properties (Mezni et al., 2022).

The self-configuration of pathways, connections, and applications appears to be the primary benefit of IoT (Uganya et al., 2022). IoT networks and smart gadgets aren't widely available. To enable and process information to accommodate reduced capacity, custom storage can be used. Mobile IoT systems are sensitive to networks, security, and the privacy of personal information, just like public address systems. Network access designs and embedded systems both have flaws and are intrusion-prone. IoT connectivity is combined with cloud environments to solve this problem. IoT customers are attracted to the Internet because of affordable operating costs, and cloud technology can meet all the requirements of IoT networks (Akhter & Sofi, 2022). With its geographically diverse data sources, cloud technology can facilitate networking and also provide data processing, dissemination and management.

Cloud technology can effectively meet all the needs of IoT systems. Basically, the cloud acts as a transport barrier between IoT and applications, increasing flexibility and agility while reducing complexity.

Despite the many advantages of combining the cloud with IoT, it also has several disadvantages, including concerns over service contracts, quality of service, portability, and security. Depending on customer requirements, connecting IoT modules to cloud computing can involve a single cloud or multiple databases. Various systems and cloud environments may have various designs. Public and private clouds both have the ability to connect. This can include hybrid IT solutions that incorporate cloud resources and various cloud environments, unlike multi-cloud.

Because the Internet of Things is a multi-cloud ecosystem, different individual operators must offer different services to the entire cloud as long as it is a platform and has to be connected. This detection technique, which detects in a multi-cloud environment before actual transmission, is also utilized for other network vulnerability scans. A multi-cloud system is made up of numerous diverse centres that are dispersed over the Internet.

Internet of Things Systems If the storage facilities are topologically or physically scattered, using several service providers may result in a variety of issues (Rajawat et al., 2021). Communication expenses will rise and the cloud infrastructure won't be able to support IoT devices' compute and storage requirements if the network is totally moved to a centralized data centre. When third parties are given access to information, the possibility of attacks that can reduce the level of service that a multi-cloud IoT system offers drastically increases. Intrusion detection and prevention of IoT modules supporting multi-cloud systems appears to be necessary in order to identify prospective attacks.

To address this issue, cloud computing environments are integrated with IoT connection. Because of the Internet's low operational costs, IoT clients are drawn to it, and cloud technology can accommodate all of their needs (Rezk et al., 2021). Cloud technology may help with networking and also enable data processing, distribution, and administration thanks to its geographically diverse data sources.

Cloud computing effectively satisfies all the requirements of IoT systems. In essence, the cloud serves as a transport barrier that separates IoT from applications, enhancing flexibility and agility while minimising complexity.

11 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/accuracy-determination/325949

Related Content

Mastering Cloud Scalability: Strategies, Challenges, and Future Directions: Navigating Complexities of Scaling in Digital Era

Kaushikkumar Patel (2024). *Emerging Trends in Cloud Computing Analytics, Scalability, and Service Models* (pp. 155-169).

www.irma-international.org/chapter/mastering-cloud-scalability/337837

Optimal Resource Provisioning in Federated-Cloud Environments

Veena Goswami and Choudhury N. Sahoo (2015). *Advanced Research on Cloud Computing Design and Applications* (pp. 84-101).

www.irma-international.org/chapter/optimal-resource-provisioning-in-federated-cloud-environments/138499

Intelligent Randomize Round Robin for Cloud Computing

Muneer O. Bani Yassein, Yaser M. Khamayseh and Ali M. Hatamleh (2013). *International Journal of Cloud Applications and Computing* (pp. 27-33).

www.irma-international.org/article/intelligent-randomize-round-robin-cloud/78516

A Cloud-Oriented Reference Architecture to Digital Library Systems

K. Palaniveland S. Kuppuswami (2015). *Cloud Technology: Concepts, Methodologies, Tools, and Applications* (pp. 466-489).

www.irma-international.org/chapter/a-cloud-oriented-reference-architecture-to-digital-library-systems/119868

A Holistic View on Blockchain and Its Issues

Mohd Azeem Faizi Noor, Saba Khanum, Taushif Anwar and Manzoor Ansari (2021). *Blockchain Applications in IoT Security* (pp. 21-44).

www.irma-international.org/chapter/a-holistic-view-on-blockchain-and-its-issues/261878