

# Botnet Detection in IoT

**Manoj H V, M S Omprakah, Manogna K M, Pavana M, Prof. Ashok K N**

Department of Computer Science and Engineering  
SJC Institute of Technology, Chikkaballapur, Karnataka, India

**Abstract:** *The proliferation of IoT devices has brought about a higher risk of botnet attacks, which can cause severe damage to networks and devices. A botnet refers to a network of compromised devices that are exploited to carry out various malicious activities, including DDoS attacks, spamming, and data theft. Given the significance of IoT device security, it is crucial to develop effective methods for detecting botnets. To address this issue, we propose a hybrid deep learning technique for botnet detection. Our approach revolves around configuring network traffic routing, which allows us to identify botnet attacks by analyzing patterns in network traffic. Deep learning models, such as Long Short-Term Memory (LSTM) and Deep Neural Networks (DNN), play a crucial role in enhancing the accuracy of detection. These models enable the system to learn from historical patterns and adapt to new ones, improving its ability to identify and flag botnet activity.*

**Keywords:** IoT, Deep learning, LSTM, DNN, DDoS, security

## REFERENCES

- [1]. ChamanWijesiriwardana and Prasad Wimalaratne, "On the Detection and Analysis of Software Security Vulnerabilities", 2017.
- [2]. R.GaneshBabu, A.Nedumaran, AsefaSisay, "Machine Learning in IoT Security Performance Analysis of ,2019.
- [3]. RanadheerErrabelly, KeweiSha, Wei Wei, T. Andrew Yang, "EdgeSec: Design of an Edge Layer Security Service to Enhance IoT Security", 2017.
- [4]. Bogdan Oniga Stefan Harsan Farr Adrian MunteanuVasileDadarlat, "IoT infrastructure secured by TLS level authentication and PKI identity system", 2018.
- [5]. RuchiVishwakarma, Ankit Kumar Jain."A Honeypot with Machine Learning based Detection Framework for defending IoT based Botnet DDoS Attacks."2019 International Conference on trends in Electronics and Informatics.
- [6]. HadeelAlazzam,AbdulsalamAlsmady,Amaal Al Shorman."Supervised Detection of IoT Botnet Attacks."
- [7]. Xiaoyu Liang, TaiebZnati."A Long Short-term Memory enabled framework for DDoSDetcetion."
- [8]. R. K. Kodali, V. Jain, S. Bose, and L. Boppana, "IoT Based on Smart Security and Home Automation System," International Conference on Computing, Communication and Automation, pp. 1286-1289, 2016
- [9]. Ala Al-Fuqaha, Mohsen Guizani, Mehdi Mohammadi, "Internet of things: a survey and enabling technologies protocols and application" IEEE Communication Surveys & Tutorials, vol. 17, no. 4, Fourth Quarter 2015
- [10]. Sriram S, Vinayakumar Ry, MamounAlazabz, Soman KP. "Network Flow based IoT Botnet Attack Detection using Deep Learning."
- [11]. G. Apruzzese, M. Colajanni, and M. Marchetti, "Evaluating the effectiveness of adversarial attacks against botnet detectors," in Proc. IEEE Int. Symp. Netw. Comput. Appl., Oct. 2019, pp. 18.
- [12]. Z. M. Algelal, E. A. GhaniAlhaher, D. N. Abdul-Wadood et al., "Botnet detection using ensemble classifiers of network ow," IAES Int. J. Electr. Comput. Eng., vol. 10, no. 3, p. 2543, 2020.