How does the performance of federated learning models (like FEDetect) compare to centralized deep neural netwo

Assignee Research

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Abstract

This work investigates the possibilities enabled by federated learning concerning IoT malware detection and studies security issues inherent to this new learning paradigm. In this context, a framework that uses federated learning to detect malware affecting IoT devices is presented. N-BaIoT, a dataset modeling network traffic of several real IoT devices while affected by malware, has been used to evaluate the proposed framework. Both supervised and unsupervised federated models (multi-layer perceptron and autoencoder) able to detect malware affecting seen and unseen IoT devices of N-BaIoT have

1 Introduction

This paper examines: Federated Learning for Malware Detection in IoT Devices. Research question: How does the performance of federated learning models (like FEDetect) compare to centralized deep neural networks in terms of detection latency and throughput when evaluated on the AndroZoo benchmark with varying levels of obfuscation?.

2 Methodology

Systematic literature search across multiple databases yielded 11 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.2/10.

3 Results

11 papers retrieved. 4 claims extracted; 0 independently verified. Quality review score: 4.2/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
Federated Learning enables data privacy by design, as data is not shared with any external identity.	×	0.09
the use of realistic datasets in the FL context for intrusion detection is lacking in previous works	×	0.05
The model achieved an accuracy of 95% in malware classification	×	0.08
The federated model achieves 95% accuracy in a binary classification scenario	×	0.08

References

- http://arxiv.org/abs/2004.02396v1
- http://arxiv.org/abs/2104.09994v3
- http://arxiv.org/abs/1510.07338v2