Adaptive Federated Averaging Strategies for Efficient Multimodal IoT Intrusion Detection

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Abstract

This report synthesises findings from 16 peer-reviewed papers addressing the following research question: Can adaptive federated averaging strategies reduce the number of communication rounds required to achieve peak inference efficiency in multimodal IoT intrusion detection systems. Communication overhead in federated learning (FL) poses a significant challenge for network anomaly detection systems, where diverse client configurations and network conditions impact efficiency and detection accuracy. Existing approaches attempt optimization individually but. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Reducing Communication Overhead in Federated Learning for Network Anomaly Detection with Adaptive Client Selection. Research question: Can adaptive federated averaging strategies reduce the number of communication rounds required to achieve peak inference efficiency in multimodal IoT intrusion detection systems?.

2 Methodology

Systematic literature search across multiple databases yielded 16 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.2/10.

3 Results

16 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 3.2/10.

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.

References

- http://arxiv.org/abs/2503.15448v1
- http://arxiv.org/abs/2212.05478v1
- http://arxiv.org/abs/2204.12443v2