

# FedQuad Performance in Non-IID Intrusion Detection Benchmarks Against FedAvg and FedProx

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## Abstract

This report synthesises findings from 11 peer-reviewed papers addressing the following research question: How does FedQuad’s performance compare to existing federated learning methods (e.g., FedAvg, FedProx) in terms of F1-score and false positive rate when evaluated on standardized intrusion detection. Anomaly detection presents a unique challenge in machine learning, due to the scarcity of labeled anomaly data. Recent work attempts to mitigate such problems by augmenting training of deep anomaly detection models with additional labeled anomaly samples. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Understanding the Effect of Bias in Deep Anomaly Detection. Research question: How does FedQuad’s performance compare to existing federated learning methods (e.g., FedAvg, FedProx) in terms of F1-score and false positive rate when evaluated on standardized intrusion detection benchmarks like NSL-KDD or CICIDS2017 under non-IID settings?.

## 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 4.3/10.

### **3 Results**

11 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 4.3/10.

### **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/2212.00966v1>
- <http://arxiv.org/abs/2105.07346v1>
- <http://arxiv.org/abs/2503.03031v1>