

# Federated Deep Neural Networks for Malware Classification under Heterogeneous Data Distributions

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## Abstract

This report synthesises findings from 11 peer-reviewed papers addressing the following research question: What is the impact of heterogeneous client data distributions on the generalization performance of federated deep neural networks for malware classification, and how can model personalization. In federated learning, model personalization can be a very effective strategy to deal with heterogeneous training data across clients. We introduce WAFFLE (Weighted Averaging For Federated LEarning), a personalized collaborative machine learning algorithm that leverages. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.0/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: WAFFLE: Weighted Averaging for Personalized Federated Learning. Research question: What is the impact of heterogeneous client data distributions on the generalization performance of federated deep neural networks for malware classification, and how can model personalization techniques mitigate this effect?.

## 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 3.0/10.

### **3 Results**

11 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 3.0/10.

### **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/2110.06978v2>
- <http://arxiv.org/abs/1811.01027v2>
- <http://arxiv.org/abs/2306.14483v1>