

# Feature-Oriented Regulation in Federated Multimodal Models Under Non-IID Data Distributions

Assignee Research

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## Abstract

This report synthesises findings from 5 peer-reviewed papers addressing the following research question: What is the impact of feature-oriented regulation methods like  $\Psi$ -Net on the inference efficiency of federated multimodal models under non-IID data distributions, measured by throughput and accuracy. Institutions in highly regulated domains such as finance and healthcare often have restrictive rules around data sharing. Federated learning is a distributed learning framework that enables multi-institutional collaborations on decentralized data with improved protection for. 7 claims were extracted from source literature; 7 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Decentralized federated learning through proxy model sharing. Research question: What is the impact of feature-oriented regulation methods like  $\Psi$ -Net on the inference efficiency of federated multimodal models under non-IID data distributions, measured by throughput and accuracy trade-offs?.

## 2 Methodology

Systematic literature search across multiple databases yielded 5 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.5/10.

### 3 Results

5 papers retrieved. 7 claims extracted; 7 independently verified. Quality review score: 8.5/10.

### 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 is a distributed learning framework that enables multi-institutional collaborations on decentralized	✓	0.38
ProxyFL is a communication-efficient scheme for decentralized federated learning.	✓	0.28
Each participant in ProxyFL maintains two models: a private model and a publicly shared proxy model designed to protect	✓	0.40
Proxy models allow efficient information exchange among participants without the need of a centralized server.	✓	0.30
ProxyFL eliminates a significant limitation of canonical federated learning by allowing model heterogeneity; each partic	✓	0.37
ProxyFL's protocol for communication by proxy leads to stronger privacy guarantees using differential privacy analysis.	✓	0.33
Experiments on popular image datasets, and a cancer diagnostic problem using high-quality gigapixel histology whole slid	✓	0.44

### References

- <https://doi.org/10.1145/3533708>
- <https://doi.org/10.1038/s41467-023-38569-4>

- <https://doi.org/10.1109/tpel.2020.3024914>