

Submission Summary

Conference Name

3rd International Conference on Integrated Intelligence and Communication Systems
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Paper Title

Federated Learning and Decentralised Access Coordination for Machine Learning

Abstract

Federated Learning (FL) has become a core strategy for training machine-learning models over sensitive and continuously expanding data without centralizing raw records. This survey consolidates current (2022–2025) technical directions across horizontal, vertical, and transfer-based FL, with emphasis on blockchain-backed coordination and DAO-style governance. We outline optimization fundamentals (e.g., FedAvg), performance tradeoffs, and deployment characteristics in IoT, finance, health-care, and industrial systems driven by high-volume, high-velocity, and non-IID data. Continuous data growth, inter-institution dependencies, and privacy regulation have accelerated adoption of secure aggregation, differential privacy, and cryptographic protocols. The review highlights how decentralized mechanisms enhance auditability, fairness, and trust, while introducing new operational burdens such as communication overhead, bias propagation, participation imbalance, and legal constraints. We further examine access coordination models using blockchain and DAO governance, where smart-contract-based control enables transparent model update logging, incentive mechanisms, and distributed decision-making. The work concludes that scalable privacy guarantees, policy-aligned data governance, and incentive-aligned coordination are pivotal for next-generation FL ecosystems across high-risk and data-dense environments.

Index Terms—federated learning, decentralised coordination, blockchain, DAO, IoT, privacy-preserving ML

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Submission Files

federated_learning_survey.pdf (173.8 Kb, 1/9/2026, 8:27:53 AM)
