

Candidate Details

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Proposed Research Title

“Blockchain-Enabled Federated Learning Framework for Privacy-Preserving AI Systems”

Research Domain / Area

Computer Science and Engineering – Artificial Intelligence, Blockchain, Privacy-Preserving Systems.

Abstract / Summary (150–250 words)

Federated learning (FL) enables collaborative model training across multiple data sources without centralizing data, addressing critical privacy and security concerns in distributed machine learning. However, traditional FL systems face challenges related to trust, data integrity, and secure parameter aggregation. This research proposes a **blockchain-enabled federated learning framework** that integrates decentralized ledger technology with federated AI to enhance transparency, trust, and privacy preservation. Smart contracts will be utilized to ensure secure model parameter exchange, automate validation, and establish auditable data provenance. The proposed system will be evaluated for its privacy guarantees, latency, and model performance across heterogeneous, distributed datasets, demonstrating its potential for deployment in sensitive domains such as healthcare, finance, and IoT.