ABSTRACT

The rapid adoption of Unified Payments Interface (UPI) has heightened the risk of fraudulent activities in digital transactions. To mitigate this, we propose a robust fraud detection system utilizing four machine learning algorithms: Decision Tree, Random Forest, Gradient Boosting Machines (GBMs), and XGBClassifier.Decision Tree offers clear, rule-based classification, enhancing interpretability. Random Forest improves accuracy and resilience by reducing overfitting. GBMs iteratively refine weak models to detect evolving fraud patterns effectively.

XGBClassifier, a high-performance gradient boosting algorithm, ensures fast computation, handles missing values efficiently, and prevents overfitting, making it ideal for large-scale fraud detection.By integrating these techniques, our approach enhances fraud detection accuracy, reliability, and adaptability in UPI transactions. The system efficiently differentiates fraudulent transactions, strengthening financial security and fostering trust in digital payments, making it suitable for real-world financial deployment.

Keywords: UPI, Fraud Detection, Decision Tree, Random Forest, GBMs, XGBClassifier, Machine Learning, Financial Security.