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SCHOOL OF COMPUTER SCIENCE ENGINEERING and INFORMATION SYSTEMS

FALL Semester – 2025-26

BITE497J – Project I

B.Tech (IT)

0th Review

Register Number	22BIT0204, 22BIT0210, 22BIT0525
Student Name	Divya Khairha , Anubhav Jain, Subin Kumar
Project Code (Course Code)	BITE497J – Project I
Project Domain	Quantum Machine Learning
Project Title	Quantum-Enhanced Fraud Detection in Banking

Abstract	As digital banking becomes increasingly widespread, financial fraud has grown more sophisticated, often outpacing traditional detection methods. Machine learning techniques like decision trees, support vector machines, and deep learning models have been used to detect unusual transaction behaviour. While effective in many cases, these systems often struggle with identifying subtle or novel fraud patterns hidden in large, complex datasets. Their dependence on labelled training data and fixed feature sets limits adaptability. As attackers develop more advanced strategies, there is a growing need for detection systems that can learn from deeper relationships within the data and generalize better to new types of fraud. This project proposes a quantum-enhanced model that integrates classical data preprocessing with quantum computing techniques to improve fraud detection performance. The approach involves encoding transaction features into quantum states, allowing a quantum circuit to analyse relationships that are difficult to capture through classical means alone. By working within a quantum framework, the system can explore higher-dimensional data structures and potentially uncover hidden patterns. A hybrid optimization process, involving both classical and quantum components, refines the model for improved accuracy. This method aims to build a smarter, more adaptive fraud detection system capable of handling modern banking threats more effectively.
Keywords	Quantum Machine Learning (QML), Fraud Detection, Cybersecurity, Quantum-Classical Hybrid Model, Financial Security, Quantum Encoding, Banking Systems
Approval Status	YES
Meeting date & Time	JULY 24 2025 12:00 PM
Student Guide Interaction meeting	● Overview of quantum-based fraud detection in banking. ● Existing fraud detection methods and their limits. ● Importance of early fraud detection. ● QML solutions to classical model drawbacks.
Guide Name	Prof. Usha Devi G.
Guide Signature	
Approval Date	

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