

PROJECT

P R O P O S A L

Credit Card Security Using AI

MEET OUR TEAM



**Omar Wael
Elsharkawy**



**Khaled Ahmed
Eldefry**



**Omar Eid
Awad**



**Muhamed hamada
Muhamed**



**Sarah
Mohamed
Elghazali**

INTRODUCTION

As the reliance on credit cards for financial transactions grows, ensuring security and preventing misuse have become paramount. Real-time detection and restriction of unauthorized transactions are crucial to mitigate financial losses and build trust among users. Traditional rule-based systems often fail to adapt to the complex and ever-changing nature of credit card fraud. This project proposes leveraging artificial intelligence (AI) and machine learning (ML) algorithms to develop an adaptive, efficient, and user-friendly credit card restriction system. The focus is on identifying fraudulent activities while maintaining an optimal user experience.



PROBLEM STATEMENT

- **Dynamic Fraud Patterns:** Fraudsters continuously evolve their methods, making static restriction measures ineffective.
- **Class Imbalance:** Fraudulent activities constitute a small fraction of all transactions, creating highly imbalanced datasets.
- **User Experience:** Excessively restrictive systems may inconvenience legitimate users, eroding trust in financial institutions.

The goal is to design an AI-based system that detects and restricts fraudulent activities dynamically while minimizing disruptions to genuine users. 🌐🔧🛡️

OUR GOALS

1

Data Exploration and Preprocessing

- Analyze transaction data to uncover patterns indicative of misuse.
- Address data quality issues such as missing values and imbalances using techniques like SMOTE.
- Visualize features to identify significant indicators of fraudulent behavior. 🔍🌐🔧

2


Model Development

- Develop machine learning models using decision trees, ensemble methods, and neural networks to classify transactions.
- Implement algorithms for dynamic restriction measures based on the assessed risk level of transactions. 🔧🔌🌐

OUR GOALS


3

Model Evaluation

- Employ metrics such as precision, recall, F1-score, and ROC-AUC to assess model performance.
- Focus on reducing both false positives and false negatives to balance security and user convenience. 

RELATED WORK

Research and prior implementations offer valuable insights for this project:   

1. **Machine Learning for Fraud Detection:**
 - Studies utilizing models like support vector machines (SVMs) and random forests to classify fraudulent activities.
2. **Deep Learning Approaches:**
 - The application of convolutional neural networks (CNNs) and recurrent neural networks (RNNs) to detect complex patterns in transactional data.
3. **Dynamic Risk-Based Models:**
 - Systems that adapt restrictions dynamically based on contextual risk assessments.
4. **AI-Augmented Fraud Prevention:**
 - Evidence shows that combining AI with manual review processes enhances accuracy and reduces errors. 



CONCLUSION

This proposal outlines the development of an AI-powered credit card restriction system designed to detect misuse while minimizing disruptions for legitimate users. By leveraging advanced machine learning techniques and addressing current challenges, this system aims to set new standards for security and user experience in financial transactions. The implementation of this project will contribute to the evolution of secure and efficient credit card systems. 🛡️🌐🔧