

MES COLLEGE OF ENGINEERING - KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA245 – MINI PROJECT

Mini Project Proposal Submission - Guidelines

Approval of the mini project proposal is mandatory to continue and submit the project work.

The mini project proposal should clearly state the project objectives and the environment of the proposed project to be undertaken.

The following documents are to be submitted for approval

1. Proforma for approval of the Mini Project
2. Synopsis/Abstract with following contents
 - (a) Title of the Mini ProjectIntroduction/Overview of the Project
 - (b) Motivations of the Project
 - (c) Problem Definition and Objectives of the Project
 - (d) Basic functionalities of the Project
 - (e) Project Developing Environment

Note:

1. An editable PDF is given in the 2nd page for filling the Proforma. Fill all the appropriate entries.
2. Template format for preparing the Mini Project Synopsis/Abstract is given in the 4th page of this document.

PROFORMA FOR THE APPROVAL OF THE FIFTH SEMESTER MINI PROJECT

Mini Project Proposal No : _____
(Filled by the Department)

1. Title of the Project : CREDIT CARD FRAUD DETECTION USING ML

2. Name of the Guide : PROF. HYDERALI K

3. Register Number of the Students : MES23MCA-2002

4. Date of Submission : 29/07/2024

5. Student Details (in BLOCK LETTERS)

Signature

02

Approval Status : Approved/Not Approved

Comments/Suggestions :

First Review Comments/Suggestions :

Second Review Comments/Suggestions :

Final Review Comments/Suggestions :

Dated Signature of Committee Member

Dated Signature of HOD

1 Introduction

Credit card fraud detection is presently the most frequently occurring problem in the present world. This is due to the rise in both online transactions and ecommerce platforms. Credit card fraud generally happens when the card was stolen for any of the unauthorized purposes or even when the fraudster uses the credit card information for his use. In the present world, we are facing a lot of credit card problems. To detect the fraudulent activities the credit card fraud detection system was introduced. This project aims to focus mainly on machine learning algorithms. Credit card fraud detection is a crucial task in today's digital financial landscape due to the increasing prevalence of fraudulent activities. Traditional rule-based systems have limitations in detecting sophisticated fraud patterns, prompting the need for advanced techniques such as machine learning. This presents a comprehensive review of machine learning approaches for credit card fraud detection, encompassing various algorithms such as logistic regression, decision trees, random forests, support vector machines, and deep learning models. This discusses feature engineering, data preprocessing, model training, and evaluation techniques tailored to the specific requirements of fraud detection tasks. Furthermore, it explores ensemble methods and anomaly detection techniques to enhance the detection accuracy and reduce false positives. Real-world datasets are utilized to evaluate the performance of different machine learning models, considering metrics such as precision, recall, F1-score. The results demonstrate the effectiveness of machine learning algorithms in detecting fraudulent transactions with high accuracy and efficiency, thereby providing valuable insights for financial institutions in bolstering their fraud detection systems. Algorithms are compared and the algorithm that has the greatest accuracy, precision, recall, and F1-score is considered as the best algorithm that is used to detect the fraud.

2 Motivation

- There are many problems with manual review in credit card fraud detection like it is costly, time-consuming and lead to high false positives .
- By analyzing machine learning algorithms in this area, my main job is to reduce human time, computation and effort
- The project aims to improve fraud detection accuracy using advanced machine learning models, reducing both false positives and missed fraudulent transactions.
- Customer Trust and Security: Provide customers with a secure payment environment, thereby building trust and preventing fraud-related financial losses

3 Objective/Problem Statement

- **Enhance Fraud Detection Accuracy:** Utilize machine learning techniques to improve the accuracy of detecting fraudulent credit card transactions.
- **Minimize False Positives:** Reduce the number of legitimate transactions that are incorrectly flagged as fraudulent.
- **Adapt to Evolving Fraud Tactics:** Implement models that can adapt and respond to new fraud patterns in real-time.
- **Operational Efficiency:** Automate fraud detection processes to reduce the need for manual review and intervention.
- **Customer Trust and Security:** Enhance customer trust by providing a secure transaction environment.
- **Cost Savings:** Lower costs associated with fraud investigation and chargebacks.

4 Functionalities

- **Data Collection and Cleaning:** Collect transactional data and clean it by handling missing values, outliers, and scaling numerical features.
- **Feature Engineering:** Transform raw data into informative features suitable for model training like transaction amount, time, and user behavior for better model performance.
- **Model Training:** Train multiple machine learning models on preprocessed data to detect fraudulent transactions.
- **Model Evaluation:** Evaluate models using metrics like accuracy, precision and recall.
- **Fraud Detection:** Identifies fraudulent transactions in real-time based on transaction patterns using machine learning models.
- **User Interface:** Offers a simple and efficient UI for users to input transaction details and receive fraud detection results

5 Developing Environment

- Operating System: Windows 10
- Front-End: HTML, CSS
- Back-End: Python, Flask
- Framework: Flask
- IDE: Visual Studio Code (VS Code)
- Tools: Google Colab

6 Conclusion

Credit card fraud detection using machine learning (ML) offers businesses a powerful tool to combat fraudulent activities. ML algorithms analyze transaction data, allowing businesses to identify patterns and anomalies indicative of fraud with high accuracy. By leveraging ML technology, businesses can proactively detect and prevent fraudulent transactions, reducing financial losses and safeguarding customer assets. This approach not only enhances operational efficiency but also builds trust among customers by ensuring a secure payment environment. As technology continues to advance, ML-based fraud detection systems will play a crucial role in protecting financial transactions and preserving the integrity of the payment ecosystem. Overall, credit card fraud detection using ML empowers businesses to stay ahead of evolving fraud tactics, protect their financial assets, and maintain customer trust in an increasingly digital marketplace. As technology continues to evolve, further advancements in ML algorithms and techniques will undoubtedly enhance the effectiveness and reliability of fraud detection systems, ensuring continued security and integrity in financial transactions.