

Phase-1 Submission

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Department: CSE

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1.Problem Statements

Guarding transactions with AI-powered credit card fraud detection and prevention

2.Objectives of the Project

To develop a machine learning model capable of accurately detecting fraudulent credit card transactions.

To analyze transaction patterns and identify key indicators of fraud.

To create a real-time or near-real-time fraud detection system.

To visualize key insights for understanding fraud trends and model performance.

3.Scope of the Project

Features to be analyzed : Transaction features such as amount, time, location, merchant, user behavior, etc. - Anomaly detection based on transaction patterns. - Real-time classification of transactions as fraudulent or genuine.

4.Data Sources

- Dataset Name: Credit Card Fraud Detection - Source: Kaggle ([credit card fraud detection](#))- Type: Public dataset - Nature: Static dataset with anonymized features representing transactions made by European cardholders in 2013.

5.High-Level Methodology

- **Data Collection** –*Data Collection: - Download the dataset from Kaggle. - Load it into the working environment (Google Colab / Jupyter Notebook)*
- **Data Cleaning** – *Handle missing values if any (although the Kaggle dataset is already clean). - Remove duplicate entries if present. - Normalize/scale features where necessary.*
- **Exploratory Data Analysis (EDA)** – *Use visualizations (e.g., histograms, heatmaps, box plots) to explore class imbalance and feature distribution. - Analyze relationships between features and the fraud label.*
- **Feature Engineering** – *Derive new features like transaction velocity or user behavior metrics. - Apply PCA or dimensionality reduction if needed.*
- **Model Building** – *Derive new features like transaction velocity or user behavior metrics. - Apply PCA or dimensionality reduction if needed.*
- **Model Evaluation** – *Derive new features like transaction velocity or user behavior metrics. - Apply PCA or dimensionality reduction if needed.*
- **Visualization & Interpretation---** *Visualize model results, feature importances, and fraud detection rates using matplotlib/seaborn/Plotly.*
- **Deployment** – *- Build a demo web app using Streamlit or Flask to simulate real-time fraud detection. - Allow user input for live model predictions.*

6.Tools and Technologies

- **Programming Language** –Python
- **Notebook/IDE** –Google Colab, Jupyter Notebook
- **Libraries** –pandas, numpy, seaborn, matplotlib, plotly, scikit-learn, XGBoost, TensorFlow/Keras
- **Optional Tools for Deployment** – Streamlit, Flask, FastAPI

7.Team Members and Roles

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1.	Nirosha.M	Exploratory Data Analysis
2.	Poorna kala.G	Data collection
3.	Nithyashree.S	Data Cleaning
4.	Yalini Nachiyar.S	Model Building & visualization