App Folder Report: Ethereum Fraud Detection Streamlit Application

This report describes the Streamlit application in the App folder, which deploys the machine learning models for Ethereum fraud detection.

Overview

The app.py file contains a Streamlit web application that allows users to input Ethereum address features and receive fraud risk predictions using pre-trained models.

Key Components

1. Model Loading

The app loads three pickled files:

- random_forest_model.pkl: Primary Random Forest model

- logistic_regression_model.pkl: Baseline Logistic Regression model

- scaler.pkl: StandardScaler for feature normalization

2. Dataset Loading

Loads the Cleaned_Ethereum_Fraud_Detection.csv to get feature columns and statistics for input validation.

3. User Interface

Features a dark theme with green accents.

- Header with title and dataset info

- Sidebar with model overview and metrics

- Input fields for essential features like transactions sent/received, ETH amounts, ERC20 transactions

4. Prediction Logic

Upon clicking "Predict Fraud Risk":

- Builds feature vector from user inputs

- Random Forest makes primary prediction with probability

- Displays result in a colored card (red for high risk, green for low)

- Optional comparison with Logistic Regression model in a table

How to Run

1. Ensure all required files are in the same directory.

2. Install Streamlit: pip install streamlit

3. Run: streamlit run app.py

4. Access the app in your browser at the provided local URL.

Screenshots

Screenshots of the app interface would include:

- Main page with input fields

- Prediction results display

- Sidebar model information

(Note: Actual screenshots not included in this DOCX; refer to the running app for visuals.)