PRASUNETHON 2024

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PROBLEM STATEMENT:

FINANCIAL FRAUD IN TRANSACTIONS:

Financial fraud is a pervasive issue, impacting both individuals and institutions.
Common types of fraud include credit card fraud, identity theft, and fraudulent transactions.

STATISTICS:

In 2023, financial fraud caused global losses estimated at $30 billion.
Over 50% of financial institutions report an increase in fraud attempts annually.

IMPACT:

ECONOMIC: **Financial losses for consumers and banks.**
REPUTATION: **Diminished trust in financial systems.**
OPERATIONAL: **Higher costs associated with detecting and preventing fraud.**

CHALLENGES IN DETECTING FRAUD:

VOLUME: **A high volume of transactions makes manual review impractical.**
COMPLEXITY: **Fraudsters continuously evolve their techniques to bypass detection.**
ACCURACY: **High precision in detecting fraud is needed to minimize false positives and negatives.**

OBJECTIVE:

OUR SOLUTION:

Develop a robust web application with our machine learning model integrated to detect real-time fraudulent financial transactions.

KEY GOALS:

ACCURACY: Implement advanced machine learning models to improve the detection accuracy of fraudulent transactions.

EFFICIENCY: Ensure the solution can process large volumes of transactions quickly and effectively.

SCALABILITY: Design the system to handle the growing number of transactions and evolving fraud patterns.

USER-FRIENDLY: Create a user-friendly interface for financial institutions to easily monitor and respond to potential fraud.

PROPOSED METHODOLOGY

- Generated a synthetic dataset with features including type of payment, and initial and final amounts of sender and receiver.
- Trained a Random Forest model achieving 99.98% accuracy on the synthetic dataset for fraud detection.
- **FRONTEND:** Developed using HTML and CSS for a user-friendly interface.
- **BACKEND:** Built with Python and Flask to integrate the Random Forest model for real-time fraud detection.
- Combined frontend and backend to create a seamless web application.
- Implemented features for handling transactions and predicting fraudulent activities in real time.
- Ensured efficient interaction and high accuracy in fraud detection processes.

TECHNOLOGY STACK

MACHINE LEARNING:

RANDOM FOREST:

Selected for its high accuracy and robustness in handling complex datasets.
Achieved an impressive accuracy of 99.98%.

DATA:

A synthetic dataset has been created with these five features namely , Type of payment, initial amount of sender and receiver, and final amount of sender and receiver.

WEB DEVELOPMENT:

FRONTEND:

Developed a user-friendly and responsive interface using HTML and CSS.

BACKEND:

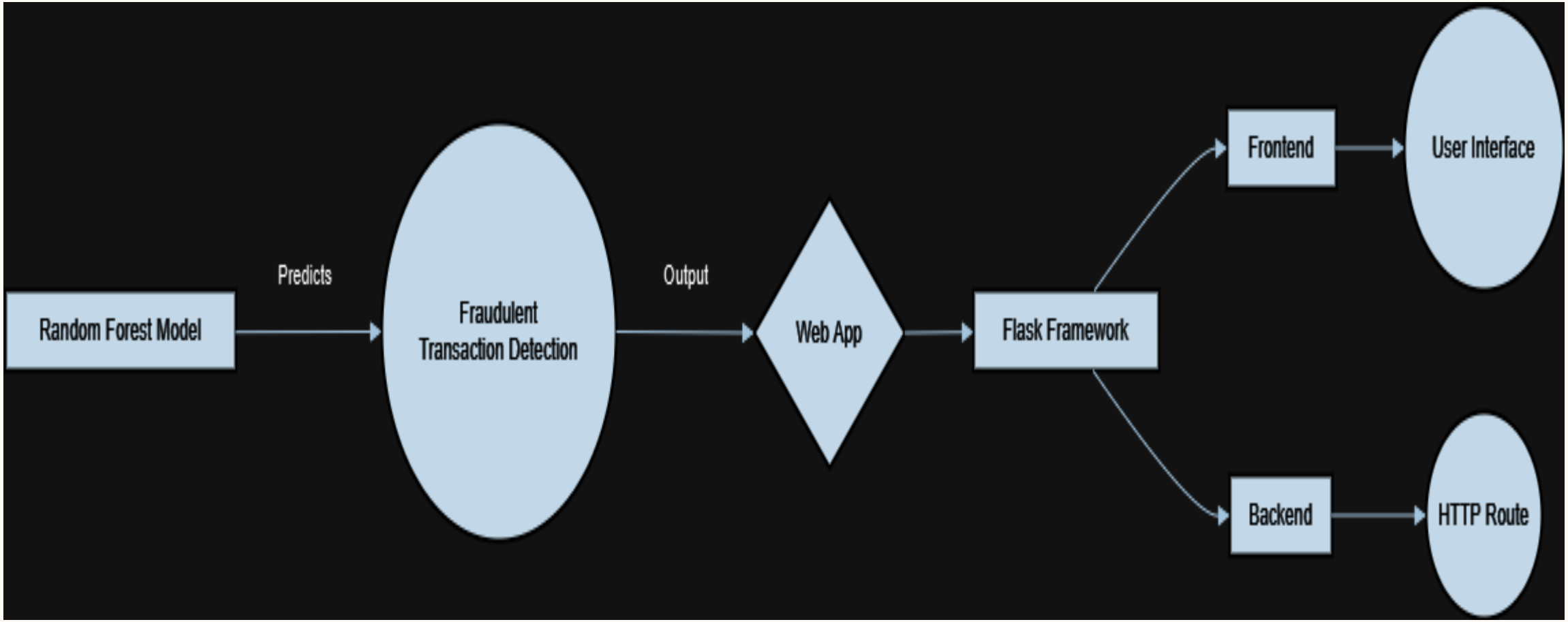
Integrated Random Forest model into the web application's backend for real-time fraud detection using Flask framework.

DEPLOYMENT:

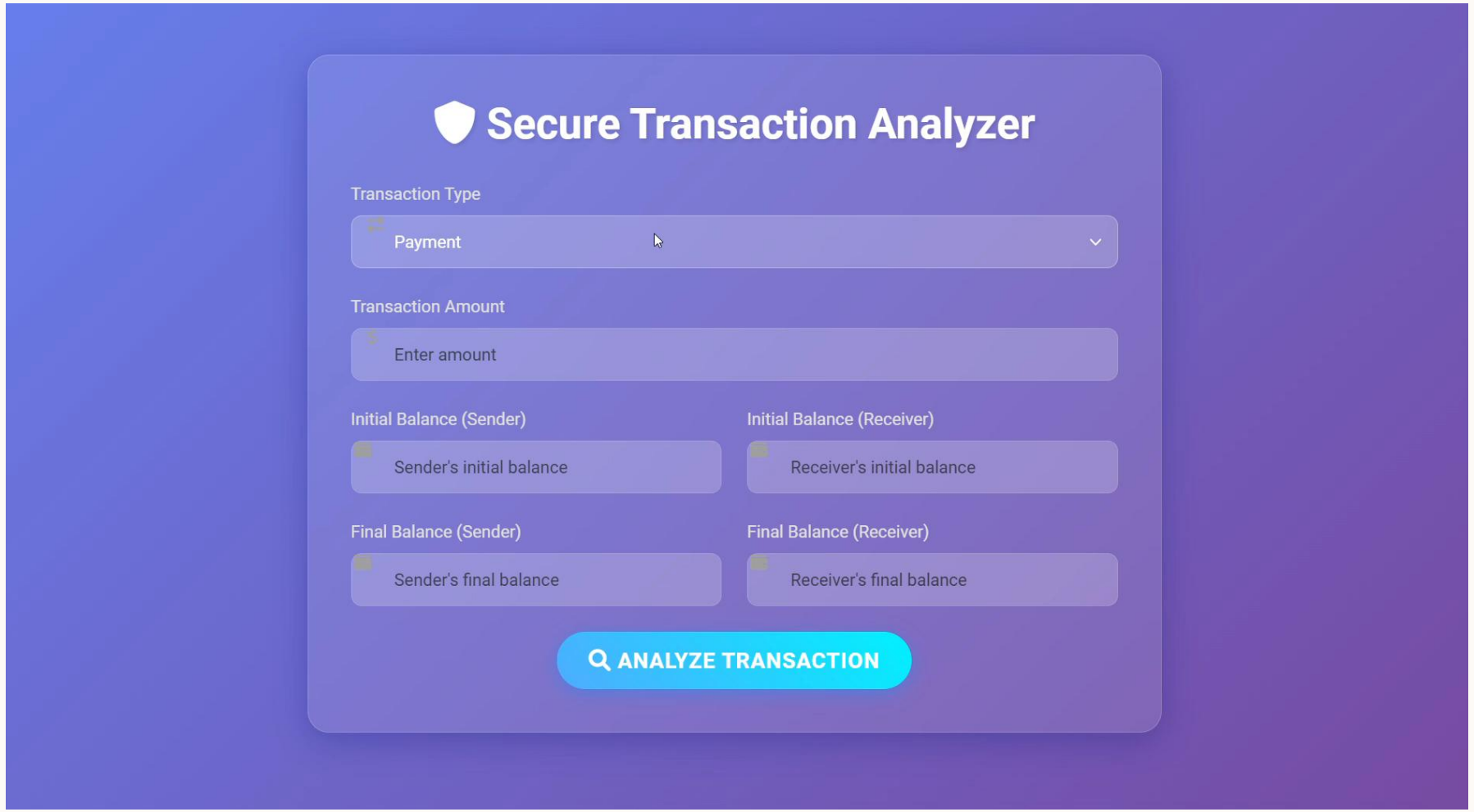
WEB SERVER:

Used for hosting the web application and ensuring scalability and reliability.

ARCHITECTURE DIAGRAM



RESULTS


Secure Transaction Analyzer
Transaction Type
Payment
Transaction Amount
Enter amount
Initial Balance (Sender)
Sender's initial balance
Initial Balance (Receiver)
Receiver's initial balance
Final Balance (Sender)
Sender's final balance
Final Balance (Receiver)
Receiver's final balance
ANALYZE TRANSACTION

CONCLUSION

- **Developed a robust fraud detection system using a synthetic dataset and trained a Random Forest model achieving 99.98% accuracy.**
- **Integrated the model into a Python Flask web application with HTML/CSS frontend for intuitive user interaction.**
- **Ensured real-time transaction processing and accurate fraud predictions, enhancing security measures.**
- **Demonstrated the effectiveness of machine learning in bolstering financial transaction integrity.**
- **Implemented a user-friendly interface that simplifies interaction and enhances user experience, facilitating seamless integration into existing financial systems.**
- **Validated the model's performance through rigorous testing and validation procedures, ensuring reliability and accuracy in detecting fraudulent activities.**

THANK YOU