# Real-Time Fraud Prevention

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GitHub : https://github.com/harshvardhansgupta/Fraud_Call_Detection

# Overview

Phone scams are on the rise, using sophisticated methods to trick people and steal their data. Immediate fraud prevention is vital to guard against these threats and ensure secure communication. Our AI model helps in real-time detection, offering protection and restoring trust in phone interactions. It's a solution aimed at reducing financial losses and emotional stress caused by scam calls. Implementing this technology can significantly improve overall safety.

# Impacts

## Financial Loss

Victims in India lost over ₹15,000 crore to scam calls in 2021.

## Frequency

Over 70% of phone users in India received scam calls in the past year

## Emotional Toll

Scams cause stress, anxiety, and loss of trust in phone communication.

# Our Solution

Our solution is a mobile application built using Kivy, featuring an advanced AI-powered fraud recognition model. The app aims to detect and prevent phone scams in real-time with an impressive 98% accuracy, ensuring safer communication for users. By leveraging speech-to-text technology and machine learning algorithms, it provides accurate and immediate fraud detection, helping users avoid potential scams

## Key Features

| | |
|---|---|
| **Real-Time Voice Recording** | The app records incoming calls and extracts the audio for analysis. |
| **Text Conversion** | The recorded audio is converted into text using speech-to-text technology, making it suitable for further processing. |
| **Fraud Detection** | The text is then analyzed by the AI model, which evaluates the content and identifies potential fraudulent activities with high accuracy. |

# Data Collection and Preprocessing

## Dataset

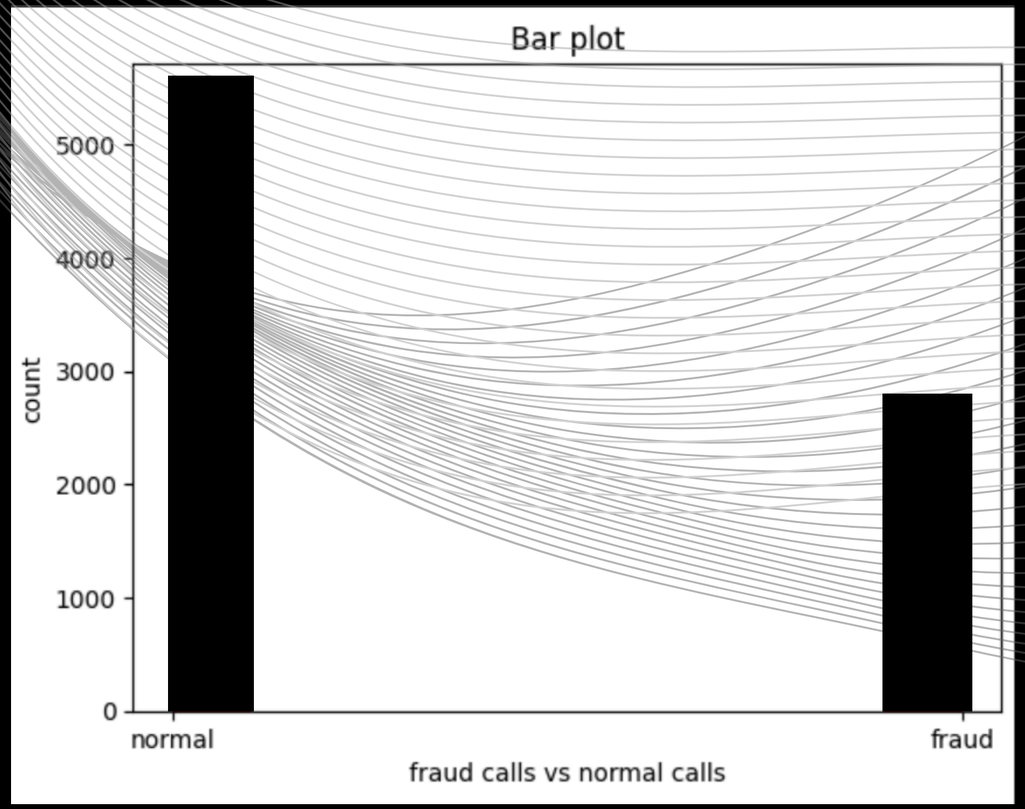
The dataset used for training the fraud recognition model consists of approximately 6000 paragraphs The dataset includes text data labeled as either 'fraud' or 'normal'. Each paragraph provides clues and context that help in distinguishing between fraudulent and legitimate calls.

## Preprocessing Steps

**1. Data Cleaning:**
Filtering: Remove irrelevant and incomplete data entries.
Shuffling: Randomize the dataset to ensure unbiased training

**2. Encoding:**
Convert 'fraud' and 'normal' labels to numerical values (1 and 0).

**3. Text Vectorization:**
Use the **TF-IDF** Vectorizer to transform text into numerical features.
Select the top 5000 words significant for identifying fraud.



# Model Training and Evaluation

## Algorithm

Logistic Regression is a binary classification algorithm that predicts the probability of a binary outcome, such as fraud or normal. It uses a logistic function to model the relationship between input features and the target variable, producing probabilities between 0 and 1. The model fits a linear decision boundary, adjusting weights to minimize the loss function, typically log loss. This enables accurate classification based on learned patterns.

## Training Process

**1. Data Splitting :**
The dataset is split 80:20 into training and testing sets.

**2. Model Fitting:**
The Logistic Regression model is trained on the training set.

**3. Evaluation:**
The model's performance is tested on the test set, and accuracy is measured.

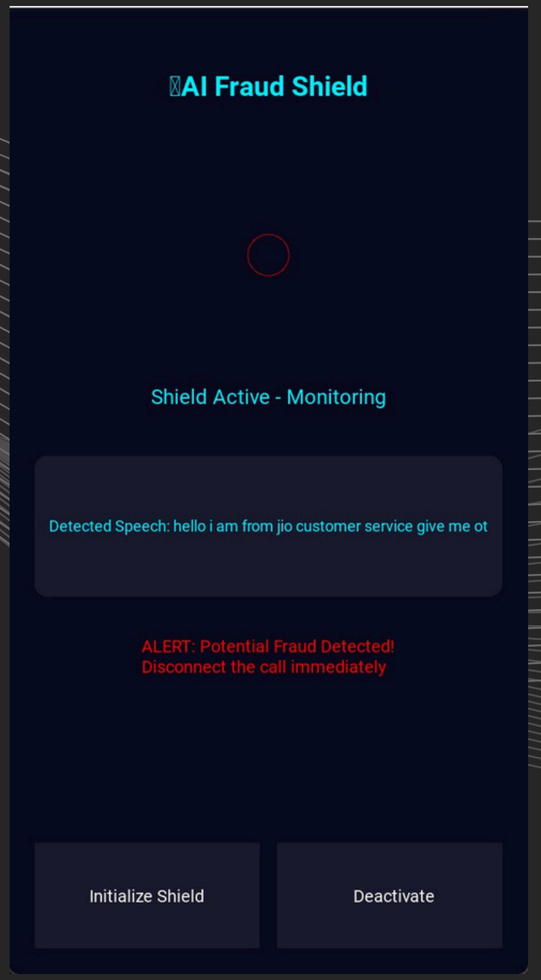
## Result

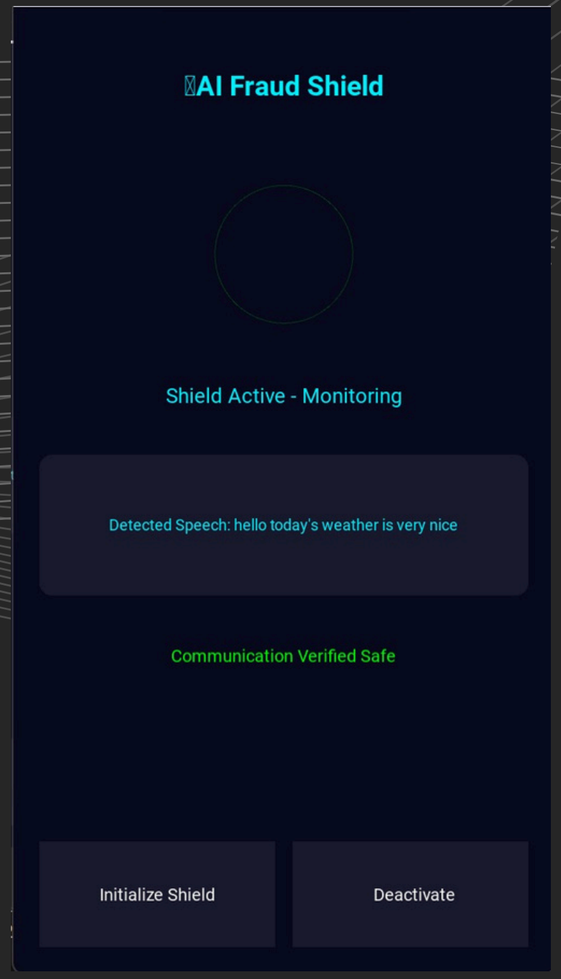
**Accuracy**:
Achieved 98% accuracy in detecting fraudulent calls. This high accuracy indicates the model's reliability in identifying phone scams.

# Application Demonstration

## Application Overview

Our mobile application, built using Kivy, aims to provide users with real-time protection against phone scams. The app integrates advanced AI-powered fraud detection capabilities to ensure accurate identification of fraudulent calls. Key features include real-time voice recording, seamless audio-to-text conversion, and high-accuracy fraud detection with user alerts. The user-friendly interface and customizable settings enhance the overall experience, offering reliable protection and peace of mind.



# Application Procedures

01
## Voice Recording

The app automatically records incoming calls. Users can also manually initiate a recording for outgoing calls

02
## Audio Conversion

The recorded voice is converted into text using speech-to-text technology.

03
## Text Processing

The converted text is fed into the fraud detection model.

04
## Fraud Detection

The AI model analyzes the text and determines whether the call is fraudulent or normal.

05
## User Alert

If a fraud is detected, the user receives an instant alert, allowing them to take necessary action.

# THANKYOU