

Infosys Aadhaar Fraud Detection System

This repository contains an end-to-end Aadhaar Fraud Detection System built using **FastAPI**, **React (Vite)**, **EasyOCR** / **Tesseract OCR**, **OpenCV**, **Machine Learning**, and **QR Code Decoding**.

Live Deployment Links: - **Frontend**: <https://e71089df.infosys-aadhar-devansh.pages.dev/dashboard> - **Backend (HuggingFace API)**: - https://huggingface.co/spaces/VinuthnaPesara/UID_Aadhaar - <https://vinuthnapesara-uid-aadhaar.hf.space/>



Project Overview

This project detects fraudulent Aadhaar cards using AI-based OCR, QR code validation, document feature extraction, and image analysis. It integrates a FastAPI backend with a React frontend for a seamless user experience.

Tech Stack

Backend (FastAPI)

- Python
- FastAPI
- Uvicorn
- OpenCV
- EasyOCR
- Pyzbar for QR decoding
- ML model support (ResNet-based Aadhaar real/fake classifier)

Frontend (React - Vite)

- React 19
- Axios
- Vite build & deployment via Cloudflare Pages

Project Structure

```
Infosys-Aadhar-Devansh/  
├── src/  
│   ├── api.py           # FastAPI main file  
│   ├── qr_utils.py      # QR code detection & parsing  
│   └── ocr_utils.py      # EasyOCR text extraction
```

```
├── fraud_model.py      # ML model handling
├── ...
├── aadhaar-ui/        # React Frontend
│   ├── src/
│   ├── dist/          # Production build folder
│   └── package.json
├── artifacts/         # Model weights (ignored if missing)
├── README.md
└── ...
```

AI Features

1. OCR Text Extraction (EasyOCR + Tesseract)

- Automatically extracts:
- Name
- DOB
- Gender
- Aadhaar number
- Performs formatting & validation.

2. QR Code Authenticity Check

- Extracts data from the Aadhaar QR.
- Compares:
 - OCR vs QR extracted values.
 - Photo hash integrity.
 - Validates Verhoeff checksum.

3. Image Fraud Detection Model

- CNN-based binary classifier (**real vs fake Aadhaar**).
- Detects:
 - Blur patterns
 - Edge inconsistencies
 - Tampering marks

Dashboard Features

- Upload Aadhaar image
- OCR results displayed
- QR code verification

- AI fraud probability score
- Final decision shown clearly

Live dashboard: <https://e71089df.infosys-aadhar-devansh.pages.dev/dashboard>

How to Run Locally

Backend

```
cd src
pip install -r requirements.txt
uvicorn api:app --reload
```

Frontend

```
cd aadhaar-ui
npm install
npm run dev
```

Build for deployment:

```
npm run build
```

Deployment

Backend: Cloudflare Workers (static hosting or API gateway)

Frontend: Cloudflare Pages using Vite build

The `dist/` folder from React is deployed to Cloudflare Pages.

Author

Devansh Sawhney - Data Science & Artificial Intelligence - University of Delhi

License

This project is created as part of the Infosys-Aadhaar Verification Module. Suitable for research and learning purposes.