

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://vinuthnipesara-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.

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License

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