

POTHOLE DETECTION PROJECT — FULL FOLDER STRUCTURE + EXECUTION GUIDE

FOLDER STRUCTURE (MERN + PostgreSQL + Python YOLOv8 Microservice)

project-root/

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■■■ client/ # React Frontend

■ ■■■ public/

■ ■■■■ src/

■ ■ ■■■■ components/

■ ■ ■■■■ pages/

■ ■ ■■■■ hooks/

■ ■ ■■■■ context/

■ ■ ■■■■ utils/

■ ■ ■■■■ App.jsx

■ ■■■■ package.json

■ ■■■■ vite.config.js

■

■■■ server/ # Node.js + Express Backend

■ ■■■■ src/

■ ■ ■■■■ controllers/

■ ■ ■■■■ routes/

■ ■ ■■■■ middleware/

■ ■ ■■■■ models/

■ ■ ■■■■ services/

```
■ ■ ■■■ config/  
■ ■ ■■■ app.js  
■ ■■■■ uploads/ # Stored user images  
■ ■■■■ package.json  
■ ■■■■ .env  
■  
■■■■■ python-service/ # FastAPI YOLOv8 Microservice  
■ ■■■■■ best.pt # Your trained pothole model  
■ ■■■■■ app.py  
■ ■■■■■ utils.py  
■ ■■■■■ requirements.txt  
■ ■■■■■ static/  
■  
■■■■■ database/  
■ ■■■■■ init.sql # PostgreSQL + PostGIS setup  
■ ■■■■■ migration_scripts/  
■ ■■■■■ seed_data.sql  
■  
■■■■■ docker/  
■ ■■■■■ docker-compose.yml  
■ ■■■■■ Dockerfile.server  
■ ■■■■■ Dockerfile.client  
■ ■■■■■ Dockerfile.python  
■  
■■■■■ README.md
```

HOW THE SYSTEM RUNS

-
1. User uploads image from React UI.
 2. Node receives image → forwards to Python YOLO microservice.
 3. Python detects pothole using best.pt → returns JSON.
 4. Node saves:
 - image_url
 - latitude & longitude
 - severity
 - confidence
 - detected: true/false
 5. Traveller searches Source → Destination.
 6. Backend uses PostGIS to find potholes along route.
 7. React map (LeafletJS) displays:
 - Route polyline
 - Pothole markers
 - Popup with image + severity.

COMMANDS TO RUN

1. Start Python service:
`uvicorn app:app --reload --host 0.0.0.0 --port 8001`
2. Backend (Node):
`npm install`
`npm run dev`

3. Frontend (React):

npm install

npm run dev

4. PostgreSQL + PostGIS setup:

Run database/init.sql

YOU CAN LOAD THIS PDF IN ANTIGRAVITY TO GENERATE THE FULL PROJECT

Simply upload this PDF to Antigravity and use this prompt:

"Build this entire project exactly as described in the loaded PDF.

Implement all folder structure, APIs, YOLO integration, map features,

PostGIS queries, and full MERN stack."