

# 1.

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|----|----------------------|----------|---------|---------|
| 1. | <b>(Frontend)</b>    | React.js | Vercel  | Netlify |
| 2. | <b>(Backend API)</b> | Node.js  | Render  |         |
| 3. | <b>(AI Service)</b>  | Python   | FastAPI | YOLOv8  |
|    | Render               |          |         |         |
| 4. | : MongoDB Atlas ( )  |          |         |         |

## 2.

### 2.1 (Frontend)

```
frontend/
├── public/
│   ├── index.html
│   ├── favicon.ico
│   └── locales/
│       ├── ar/
│       │   └── translation.json
│       └── en/
│           └── translation.json
├── src/
│   ├── components/
│   ├── pages/
│   ├── services/
│   ├── utils/
│   ├── App.js
│   ├── index.js
│   └── i18n.js
```

```
|— package.json
|— README.md
```

1. `process.env` :

`.env.production` :

```
REACT_APP_API_URL=https://structural-defect-api.onrender.com
REACT_APP_AI_SERVICE_URL=https://structural-defect-ai.onrender.com
```

1. **API:**

:

```
// src/services/api.js
const API_URL = process.env.REACT_APP_API_URL || 'http://localhost:8000';
const AI_SERVICE_URL = process.env.REACT_APP_AI_SERVICE_URL || 'http://localhost:8001';

// API
```

1. `vercel.json` `netlify.toml` :

Vercel:

```
{
  "rewrites": [
    { "source": "/(.*)", "destination": "/index.html" }
  ]
}
```

Netlify:

```
[[redirects]]
from = "/*"
to = "/index.html"
status = 200
```

```
backend/  
├── controllers/  
├── middleware/  
├── models/  
├── routes/  
├── services/  
├── utils/  
├── app.js  
├── package.json  
└── README.md
```

1. `package.json` :

`.env` :

```
PORT=8000  
MONGODB_URI=mongodb+srv://  
<username>:<password>@cluster0.mongodb.net/structural_defect_detection  
JWT_SECRET=your_jwt_secret_key  
AI_SERVICE_URL=https://structural-defect-ai.onrender.com  
CORS_ORIGIN=https://structural-defect-detection.vercel.app
```

1. **CORS:**

```
// app.js  
const cors = require('cors');  
  
app.use(cors({  
  origin: process.env.CORS_ORIGIN || '*',  
  methods: ['GET', 'POST', 'PUT', 'DELETE'],  
  allowedHeaders: ['Content-Type', 'Authorization']  
}));
```

1. `render.yaml` :

```
services:  
- type: web  
  name: structural-defect-api  
  env: node
```

```
buildCommand: npm install
startCommand: node app.js
envVars:
- key: PORT
  value: 8000
- key: MONGODB_URI
  sync: false
- key: JWT_SECRET
  sync: false
- key: AI_SERVICE_URL
  value: https://structural-defect-ai.onrender.com
- key: CORS_ORIGIN
  value: https://structural-defect-detection.vercel.app
```

## 2.3 (AI Service)

```
ai_service/
├── models/
│   └── yolov8m_structural_defects.pt
├── utils/
├── main.py
├── requirements.txt
└── README.md
```

### 1. Python:

requirements.txt :

```
fastapi==0.95.1
uvicorn==0.22.0
pydantic==1.10.7
python-multipart==0.0.6
ultralytics==8.0.120
numpy==1.24.3
Pillow==9.5.0
opencv-python-headless==4.7.0.72
```

### 1. CORS:

```
# main.py
from fastapi.middleware.cors import CORSMiddleware
```

```

app = FastAPI()

app.add_middleware(
    CORSMiddleware,
    allow_origins=["https://structural-defect-detection.vercel.app"],
    allow_credentials=True,
    allow_methods=["*"],
    allow_headers=["*"],
)

```

1. **render.yaml :**

```

services:
- type: web
  name: structural-defect-ai
  env: python
  buildCommand: pip install -r requirements.txt
  startCommand: uvicorn main:app --host 0.0.0.0 --port $PORT
  envVars:
  - key: PYTHONUNBUFFERED
    value: true

```

## 2.4 (MongoDB Atlas)

1. **MongoDB Atlas:**
2. [MongoDB Atlas](#)
3. (cluster)
- 4.
5. IP ( 0.0.0.0/0 )
6. **MongoDB**
7. "Connect"
8. "Connect your application"
- 9.
10. <username> <password>

## 3.

### 3.1 Vercel

1. **Vercel:**
2. [Vercel](#)

3. GitHub
4. :
5. "New Project"
6. "Import Git Repository" GitHub ( )
7. :
  - REACT\_APP\_API\_URL : https://structural-defect-api.onrender.com
  - REACT\_APP\_AI\_SERVICE\_URL : https://structural-defect-ai.onrender.com
8. "Deploy"
9. ( ) :
- 10.

### 3.2 Render

1. **Render:**
2. [Render](#)
3. GitHub
4. :
5. "New" "Web Service"
6. GitHub ( )
7. :
  - : structural-defect-api
  - : Node
  - : npm install
  - : node app.js
8. :
  - MONGODB\_URI : MongoDB Atlas
  - JWT\_SECRET : JWT
  - AI\_SERVICE\_URL : https://structural-defect-ai.onrender.com
  - CORS\_ORIGIN : https://structural-defect-detection.vercel.app
9. "Create Web Service"

### 3.3 Render

1. :
2. "New" "Web Service"
3. GitHub ( )

4. `:`
  - `: structural-defect-ai`
  - `: Python 3`
  - `: pip install -r requirements.txt`
  - `: uvicorn main:app --host 0.0.0.0 --port $PORT`
5. `:`
  - `PYTHONUNBUFFERED : true`
6. `"Create Web Service"`

4.

1. `npm install` :
2. `npm run build` URL Vercel ( <https://structural-defect-detection.vercel.app>)
- 3.
4. :
- 5.
- 6.
7. :
- 8.
- 9.
10. :
- 11.
- 12.

5.

- |                   |        |     |
|-------------------|--------|-----|
| 1.                | :      |     |
| 2. Vercel:        | 100 GB |     |
| 3. Netlify:       | 100 GB |     |
| 4. Render:        | 750    | 15  |
| 5. MongoDB Atlas: | 512 MB | 100 |

6. :

7. Render

8. ( YOLOv8n YOLOv8m)

9. :

10.

11. HTTPS

12.

13. :

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