Full Stack Development with MERN

Project Documentation format

1. Introduction

Project Title:
Transfer Learning-Based Classification of Poultry Diseases for Enhanced Health Management

Team Members:
• Chilaka Bharath – Backend Developer
• Donda Nagamma – UI Design
• Bavanath SaiKishire Naik – Data Preparation
• Battula Benarjibabu – Documentation & Testing

2. Project Overview

Purpose:
To develop an AI-based system that detects poultry diseases using image classification via a pretrained ResNet-18 model. The goal is to assist farmers and veterinary staff in identifying diseases early, thereby improving poultry health management.

Key Features:
• Upload poultry images using a web interface
• Predict disease class using pretrained ResNet-18
• Display disease name and confidence score
• Hosted on Hugging Face Spaces (no need for local setup)
• Lightweight, fast and user-friendly UI
• No database used

3. Architecture

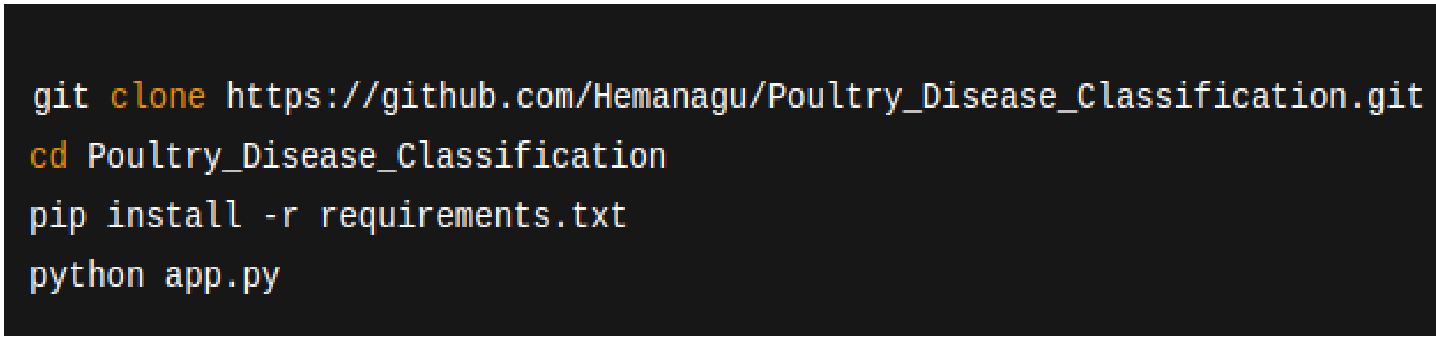
Frontend:
• HTML, CSS, JavaScript
• Jinja2 template engine (via Flask)

Backend:
• Python with Flask for routing and logic
• PyTorch for model inference (ResNet-18)
• OpenCV & PIL for image preprocessing

Database:
• Not used in this project
• All operations are in-memory or temporary file-based

4. Setup Instructions

Local Setup (Optional):

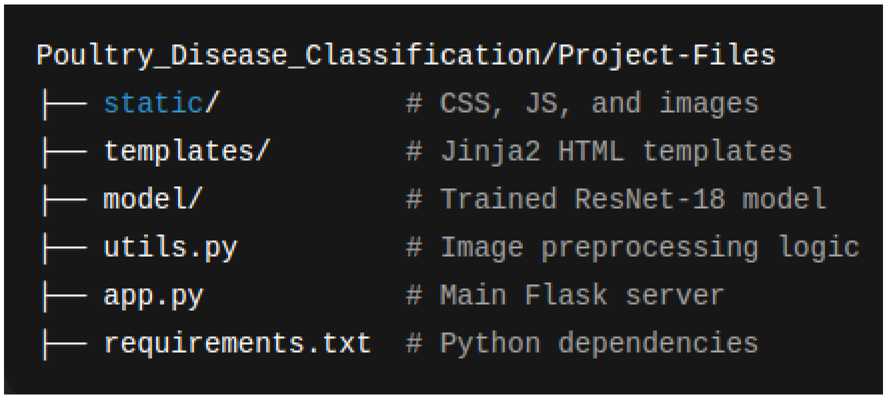


```
git clone https://github.com/Hemanagu/Poultry_Disease_Classification.git
cd Poultry_Disease_Classification
pip install -r requirements.txt
python app.py
```

OR

Access live demo on Hugging Face Spaces (link in GitHub README)

5. Folder Structure



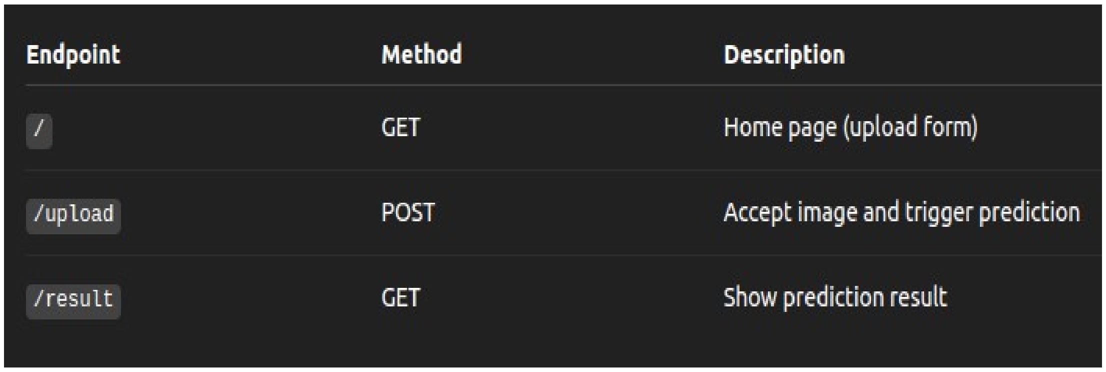
```
Poultry_Disease_Classification/Project-Files
├── static/           # CSS, JS, and images
├── templates/        # Jinja2 HTML templates
├── model/            # Trained ResNet-18 model
├── utils.py          # Image preprocessing logic
├── app.py            # Main Flask server
├── requirements.txt  # Python dependencies
```

6. Running the Application

• **Local:** Run `python app.py` then visit: http://127.0.0.1:5000

• **Cloud**: Directly use Hugging Face hosted version (shared link via GitHub)

7. API Documentation



Endpoint	Method	Description
`/`	GET	Home page (upload form)
`/upload`	POST	Accept image and trigger prediction
`/result`	GET	Show prediction result

8. Authentication

- No authentication is used.
- The app is publicly accessible via Hugging Face Spaces.

9. User Interface

- Clean web interface built with HTML, CSS, and Flask templates
- Image upload form
- Result display page (disease name + confidence score)
- Error handling for invalid images

10. Testing

Testing Strategy:

- We used **manual testing** to validate the core features of the application.
- We tested each function step-by-step to ensure correct behavior.
- Focused on **functional testing**, **UI testing**, and **error handling**.

Test Cases Included:

Test Case	Expected Result	Status
Upload valid poultry image	Displays correct disease prediction	Pass
Upload invalid file (e.g. `.txt`)	Shows error message	Pass

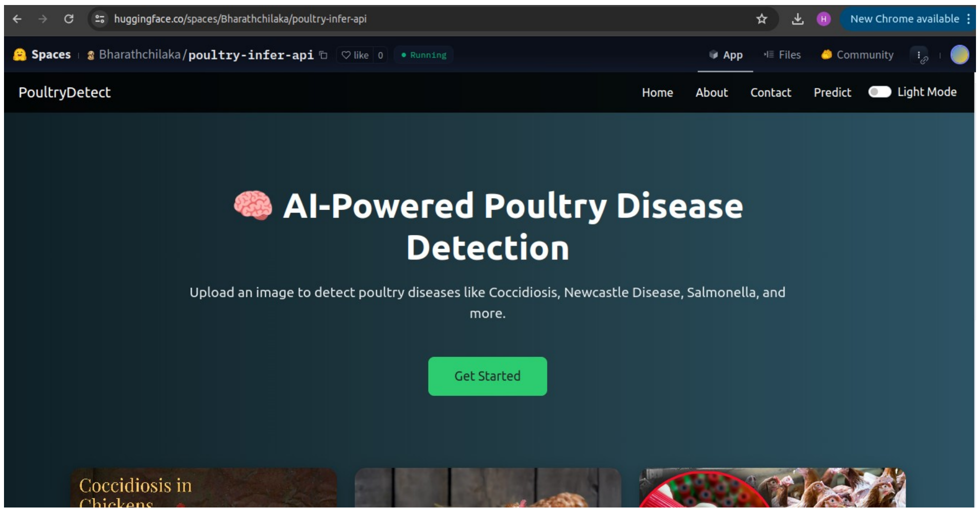
Test Case	Expected Result	Status
Upload very large image	Processes and returns result without crash	Pass
Submit with no image	Prompts user to select an image	Pass
Model response time	Returns prediction within 2–3 seconds	Pass

Tools Used:

- **Browser (Chrome/Firefox)** for UI testing
- **Python logging & print statements** for backend debugging
- **Manual form submissions** to test error cases

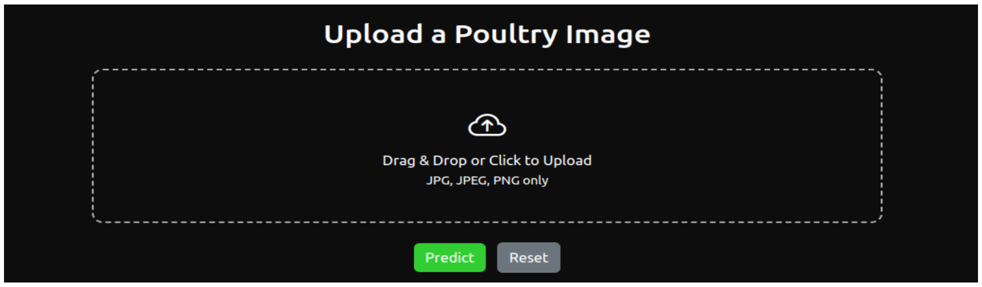
11. Screenshots or Demo

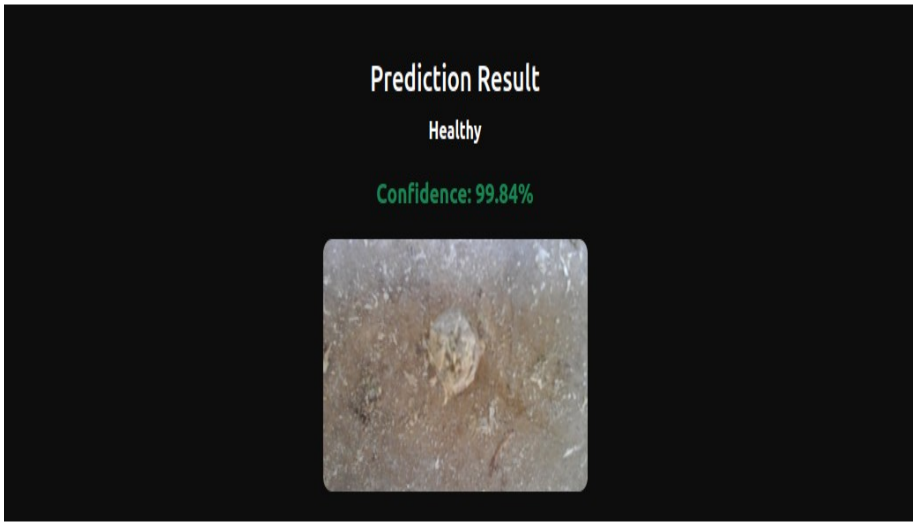
Live Demo: https://huggingface.co/spaces/Bharathchilaka/poultry-infer-api



🧠 AI-Powered Poultry Disease Detection

Upload an image to detect poultry diseases like Coccidiosis, Newcastle Disease, Salmonella, and more.





Prediction Result

Healthy

Confidence: 99.84%

12. Known Issues

- No webcam or real-time camera support
- Only supports trained disease classes
- No feedback or logging of predictions
- No user login or history tracking

13. Future Enhancements

- Add mobile version or responsive UI
- Integrate webcam for real-time detection
- Expand dataset for better accuracy
- Enable multilingual interface for farmers
- Add cloud database for feedback and analytics
- Support for more poultry disease categories