POULTRY DETECTION + FINAL REPORT

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

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- **1. INTRODUCTION**

1.1 Project Overview

The poultry industry is a major contributor to the global protein supply. However, it is vulnerable to disease outbreaks that affect livestock health and profitability. Early disease detection is critical to minimizing such risks.

This project introduces an AI-driven poultry disease detection system leveraging **Transfer Learning** to classify diseases into four categories:

- Salmonella
- Newcastle Disease
- Coccidiosis
- Healthy

The system uses a mobile application to collect input from farmers (symptoms, images, environment data) and provides real-time diagnostic results and treatment suggestions.

Key Features:

- Image-based diagnosis via deep learning
- Symptom and environment input options
- Disease history and treatment logs
- Treatment suggestions and emergency contacts

1.2 Purpose

The core goal is to offer farmers an accessible AI tool for early disease detection. Objectives include:

- Improve early diagnosis using AI-driven predictions
- Reduce economic losses from delayed treatment
- Lower dependency on veterinary services for diagnosis
- Promote responsible antibiotic use
- Educate farmers on poultry health
- Ensure scalability and adaptability to future diseases

- **2. IDEATION PHASE**

2.1 Problem Statement

Farmers face disease management issues due to:

- Poor diagnostic tools
- High veterinary costs
- Delayed intervention

This project offers an intelligent diagnostic app that improves disease detection and farm productivity.

2.2 Empathy Map Canvas

Category	Description
Says	"What’s wrong with my birds?"
Thinks	"If I lose them, I lose my income."
Does	Observes symptoms manually
Feels	Worried and frustrated

2.3 Brainstorming

- Mobile app with AI-based prediction
- Image upload and symptom entry
- Disease history tracker
- Remote consultation option
- Multilingual support

- **3. REQUIREMENT ANALYSIS**

3.1 Customer Journey Map

Stage	Action	Experience	Touchpoints
Awareness	Notices sick birds	Concerned	Farm, phone
Engagement	Opens app	Smooth process	App UI
Diagnosis	Uploads image/symptoms	Gets prediction	App result screen
Decision	Reads treatment guide	Reassured	On-app instructions
Follow-up	Logs recovery	Confident	Tracking module

3.2 Solution Requirements

Functional: Upload images, input symptoms, classify disease, display suggestions, log history

Non-Functional: Responsive UI, fast processing, secure storage, possible offline use

3.3 Data Flow Diagram

(Placeholder for DFD diagram)

3.4 Technology Stack

- **Languages:** Python

- **Frameworks:** Flask, TensorFlow
- **Tools:** Jupyter, Google Colab, VS Code
- **Deployment:** Render/Local Flask Server

- **4. PROJECT DESIGN**

4.1 Problem-Solution Fit

Demonstrated via real-life rural/commercial use cases, including fast diagnosis and education.

4.2 Proposed Solution

Deep learning-based image classifier with mobile-friendly UI. Offers prediction and actionable insights.

4.3 Solution Architecture

1. User Uploads Image
2. Flask API processes image
3. Model predicts disease
4. Result displayed

- **5. PROJECT PLANNING**

5.1 Agile Plan

Sprint	Activities
Sprint 1 :	Data collection, CNN training

Sprint Activities

Sprint 2 : Flask backend, UI design

Sprint 3 : Integration and testing

Sprint 4 Final docs, deployment

Task Allocation:

- Model Training: [CJ]
- Flask Backend: [CJ]
- Frontend UI: [CJ]
- Testing: [CJ]

Velocity & Burndown Table included (formatted)

- **6. FUNCTIONAL AND PERFORMANCE TESTING**

Model Performance:

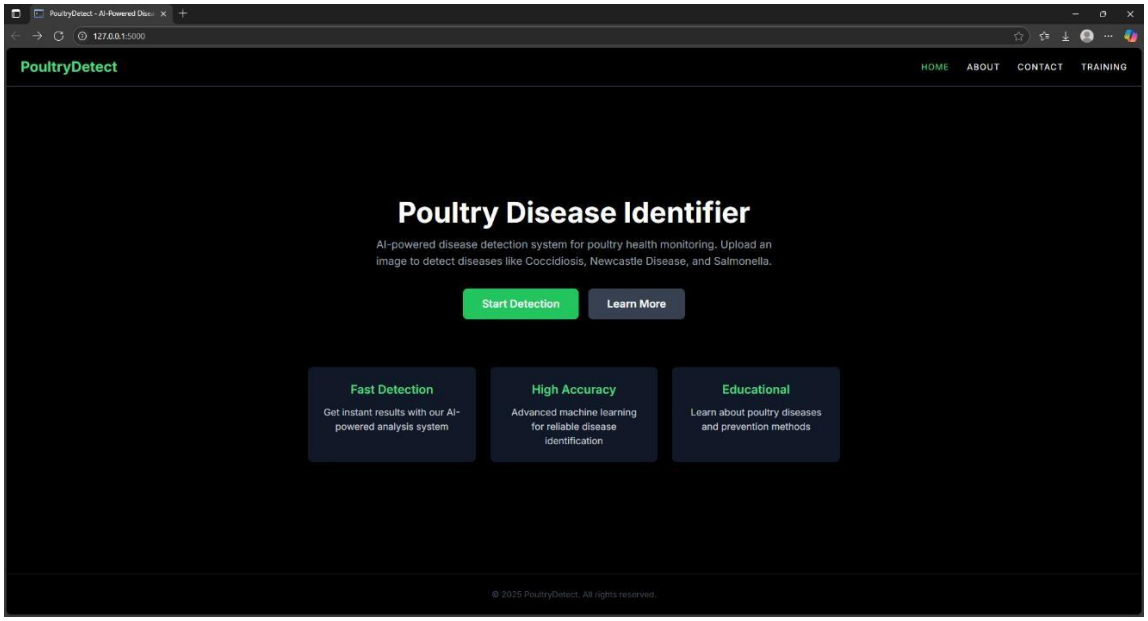
- Total Params: 2.1M
- Accuracy: 98.2% train, 94.6% val
- Fine-tuning: 95.3% val

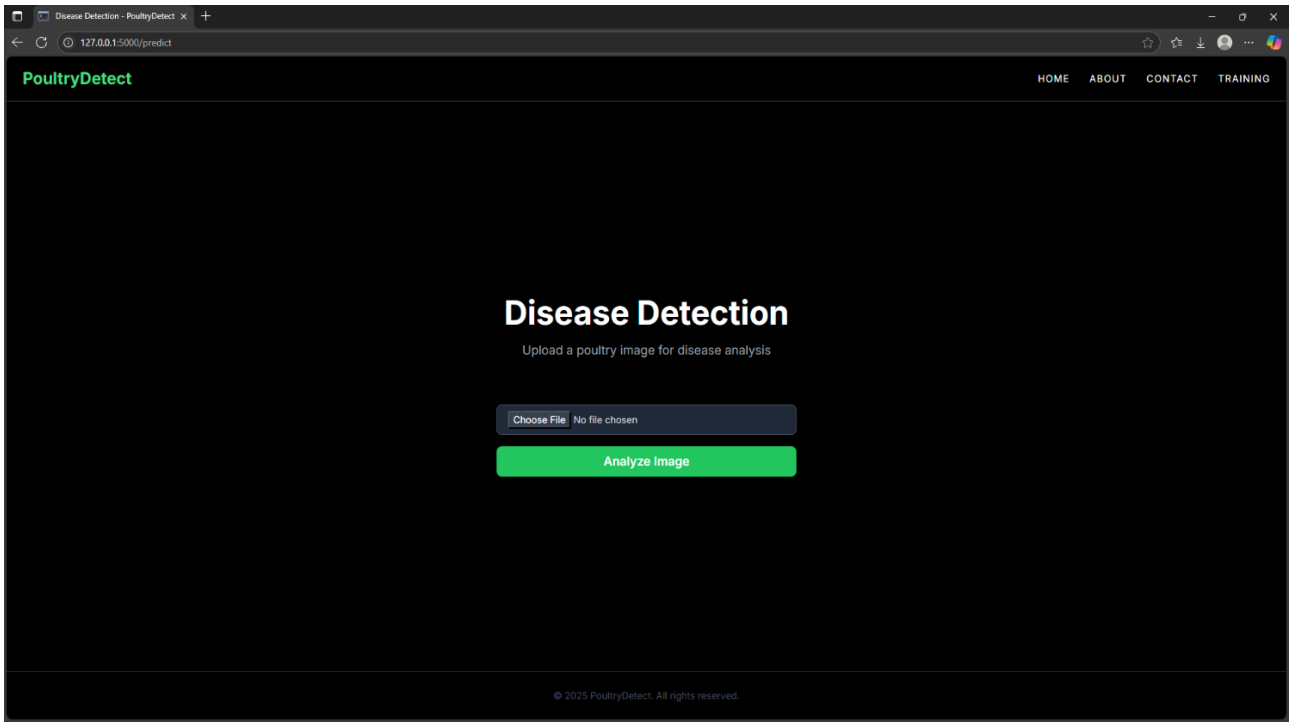
Functionality Checklist:

- Image upload: ✅
- Prediction display: ✅

- UI navigation: ✅
- Flask API response: ✅
- Error handling: ✅

- **7. RESULTS**




Disease Detection - PoultryDetect
127.0.0.1:5000/predict
PoultryDetect
HOME
ABOUT
CONTACT
TRAINING
Disease Detection
Upload a poultry image for disease analysis
Choose File
No file chosen
Analyze Image
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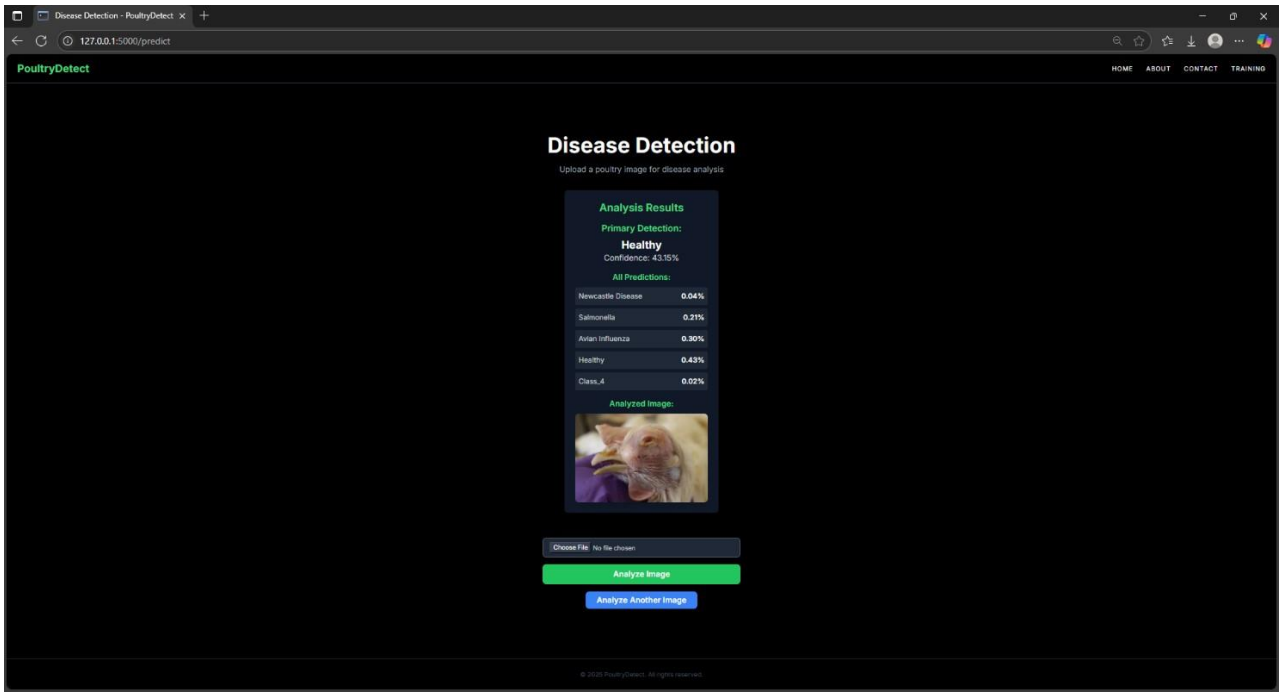
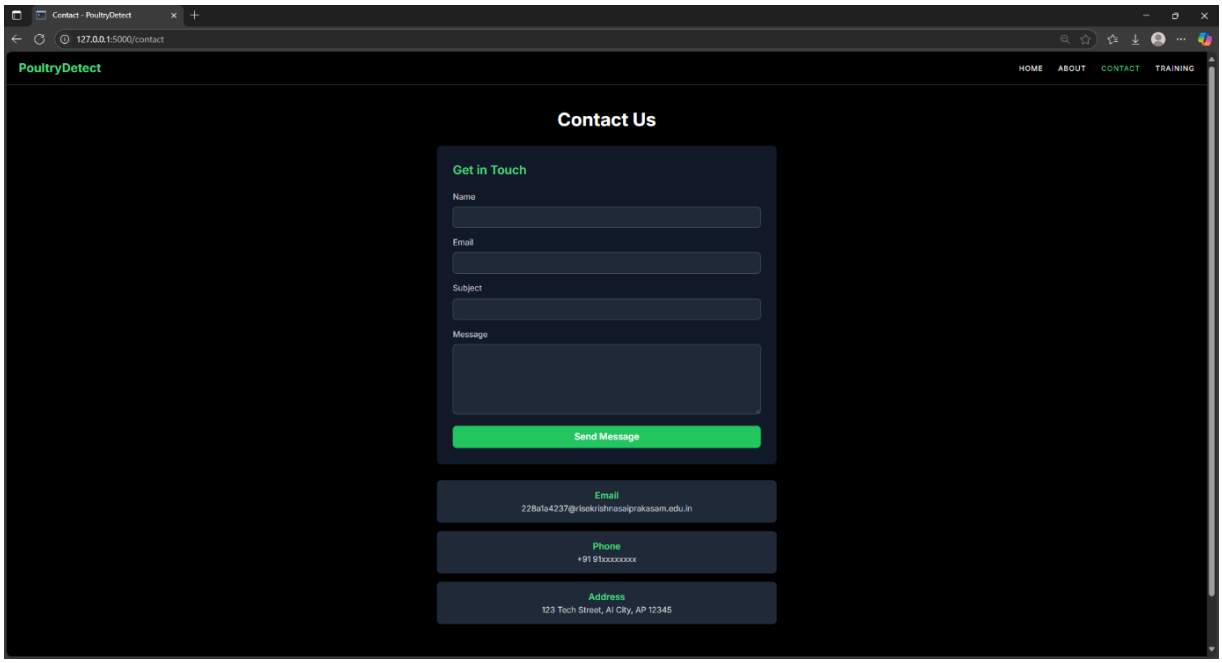

Disease Detection - PoultryDetect
127.0.0.1:5000/predict
PoultryDetect
HOME
ABOUT
CONTACT
TRAINING
Disease Detection
Upload a poultry image for disease analysis
Analysis Results
Primary Detection:
Healthy
Confidence: 43.15%
All Predictions:
Newcastle Disease 0.04%
Salmonella 0.21%
Avian Influenza 0.30%
Healthy 0.43%
Class_4 0.02%
Analyzed Image:
Choose File
No file chosen
Analyze Image
Analyze Another Image



8. ADVANTAGES & DISADVANTAGES

Advantages	Disadvantages
Early disease detection	Limited to known diseases
Reduces losses	Requires image quality
Improves vet access	Digital literacy needed
Supports large farms	Requires continuous updates

- **9. CONCLUSION**

Developed a scalable AI-based disease detection system for poultry using CNNs and Flask. Aims to empower farmers, reduce outbreaks, and modernize diagnostics.

- **10. FUTURE SCOPE**
- Add more diseases
- Launch Android/iOS version
- Suggest medicine doses
- Continuous learning model

- **11. APPENDIX**

Item	Details
Source Code	GitHub Link
Dataset	Roboflow
Demo Video	link 🖇
