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

Introduction :

Project Overview:

This project uses deep learning to classify four poultry disease conditions (Coccidiosis, Newcastle, Salmonella, Healthy) from images.

Objective:

To assist poultry farmers by providing an affordable, efficient tool for disease detection, reducing reliance on expensive veterinary consultations.

Purpose :

- Enable early, accurate diagnosis of poultry diseases.
- Reduce mortality and financial losses in poultry farming.
- Provide a fast, easy-to-use web-based tool accessible to farmers.

Ideation Phase – Problem Statement :

- Poultry diseases cause significant economic losses worldwide.
- Diagnosis traditionally requires veterinary expertise, which can be costly and unavailable in rural areas.
- There is a clear need for an automated system that can classify diseases instantly from images of affected poultry.

Ideation Phase – Empathy Map :

Farmers feel: Worried about disease outbreaks and potential flock losses.

Farmers think: Diagnosing diseases is too difficult or expensive.

Farmers do: Delay treatment due to uncertainty about the disease.

Farmers say: “How can I know what disease my chickens have without a vet?”

Ideation Phase – Brainstorming :

- Explored transfer learning with lightweight CNNs like MobileNetV2.
- Considered practical app features: image upload, clear predictions, and treatment recommendations

Requirement Analysis – Customer Journey Map :

1. User visits the web application.

2. Uploads an image of the sick chicken.

3. System processes the image and predicts the disease.

4. Application displays the result with suggested treatments.

Requirement Analysis – Solution Requirements :

- Image-based classification of four poultry diseases + healthy class.
- User-friendly web interface accessible via mobile or desktop browsers.
- Use of MobileNetV2 for fast and accurate predictions.

Requirement Analysis – Data Flow Diagram :

User Image Upload → Preprocessing → MobileNetV2 Model → Disease Prediction → Treatment Suggestion → Display Results

Requirement Analysis – Technology Stack :

Frontend: HTML, CSS, JavaScript

Backend: Flask (Python)

Model: MobileNetV2 (TensorFlow/Keras)

Database: SQLite (optional, e.g., for storing logs of predictions)

Project Design – Problem Solution Fit :

- Ensures high accuracy in classifying poultry diseases from images captured in real farm environments.
- Designed with a simple, intuitive UI for farmers with minimal technical knowledge.

Project Design – Proposed Solution :

- A Flask-based web app where farmers upload chicken images.
- Displays relevant treatment suggestions based on the detected disease.

Project Design – Solution Architecture :

Farmer’s Device (Mobile/PC)

↓

Web Application (Flask)

↓

MobileNetV2-Based Classifier

↓

Disease Prediction + Treatment Advice

(Consider adding a diagram in your document for visual clarity.)

Project Planning & Scheduling :

Week 1: Collect and pre-process poultry disease images.

Week 2-3: Train MobileNetV2 with transfer learning.

Week 4: Develop the Flask-based web interface.

Week 5: Integrate the trained model with the web app.

Week 6: Perform end-to-end testing and deploy the application online.

Functional and Performance Testing :

- Test accuracy of the trained model on unseen images (target: >90% accuracy).

- Measure prediction speed per image (goal: <1 second).
- Conduct user testing with poultry farmers to ensure usability.

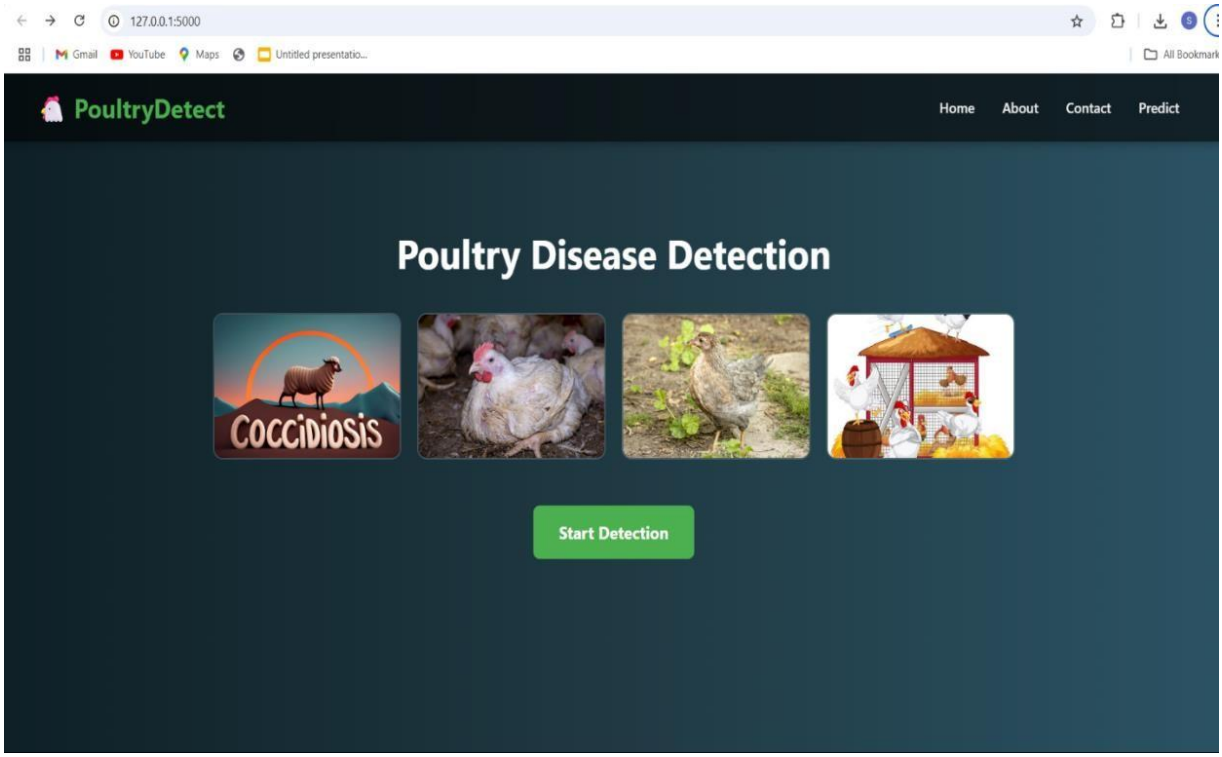
Results & Achievements :

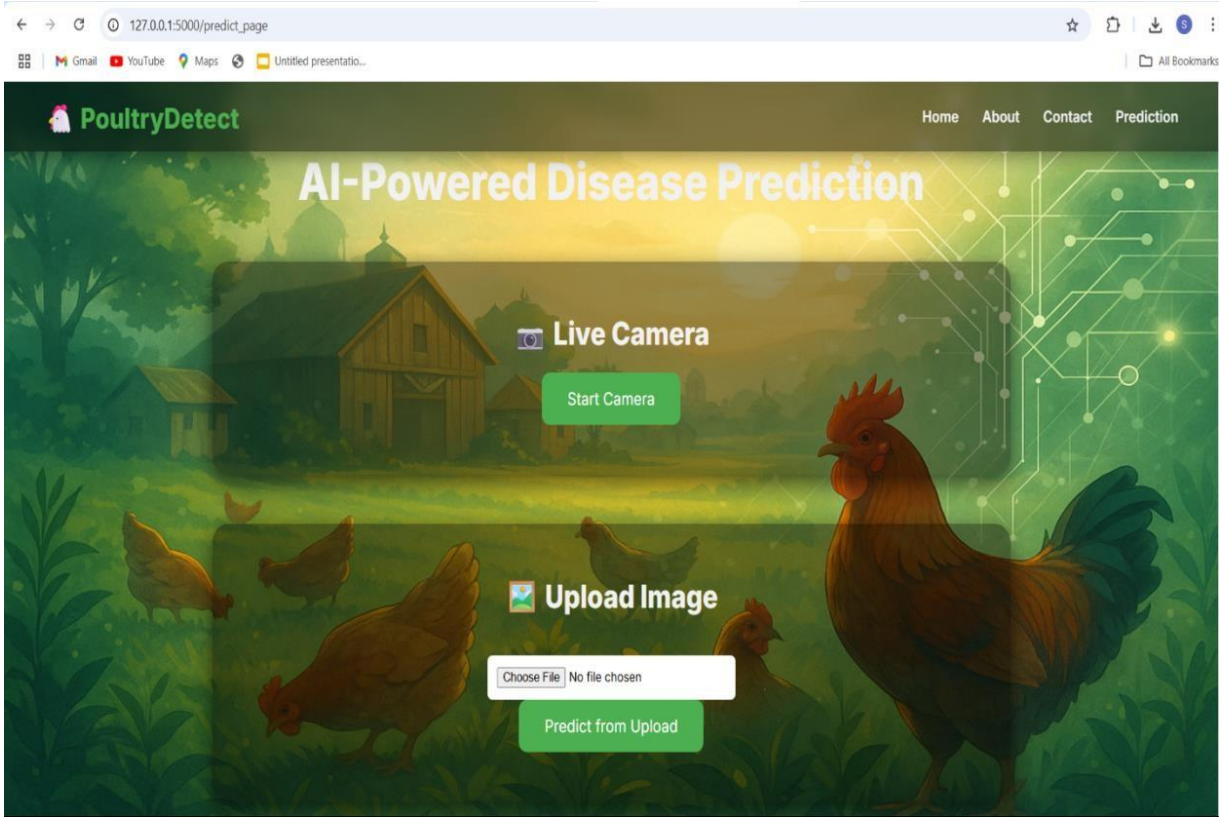
- Achieved classification accuracy of [insert your final accuracy, e.g., 92%].
- Fast prediction times suitable for real-time diagnosis.
- User-friendly interface validated through feedback from farmers or testers.

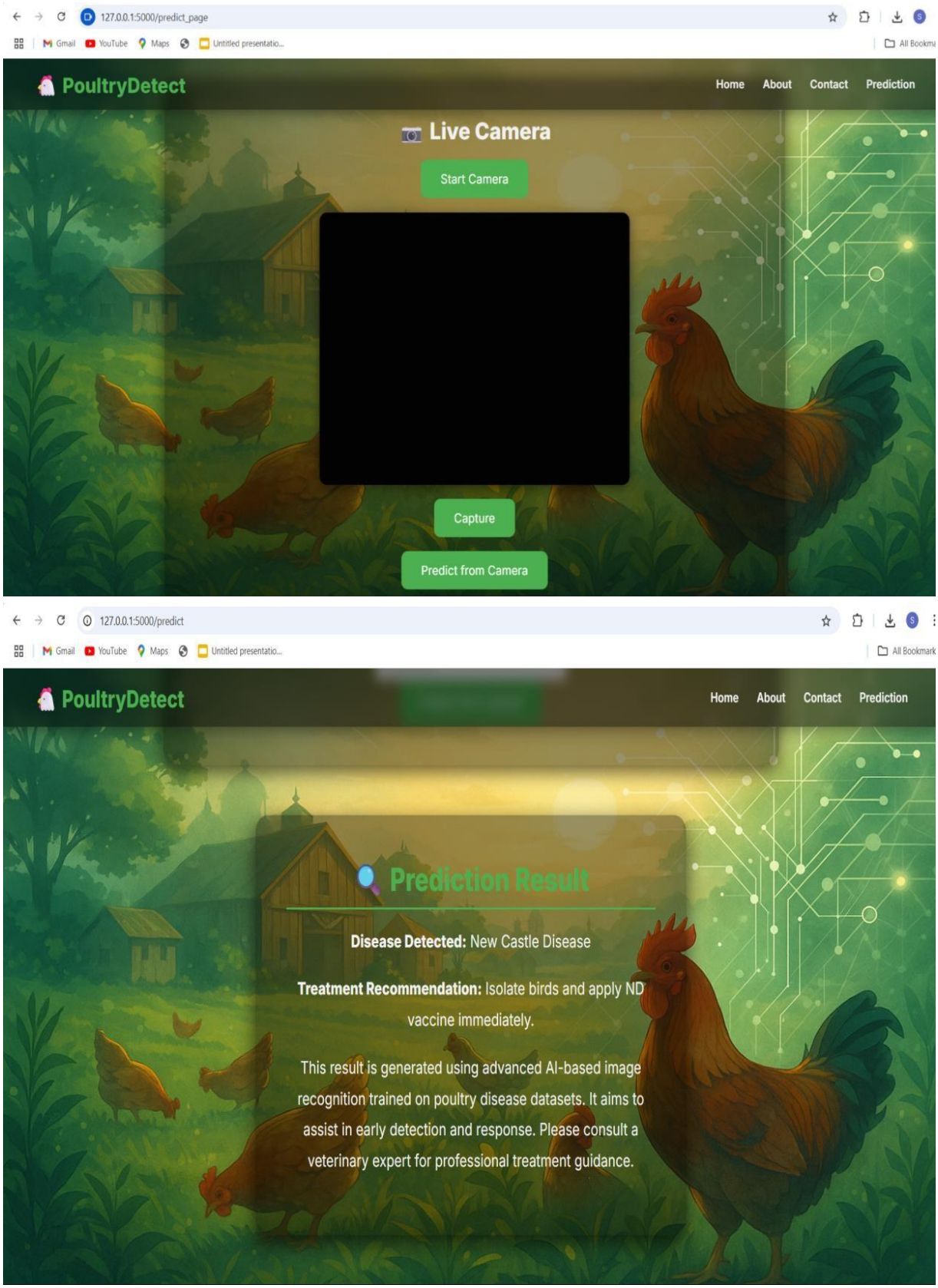
Future Work :

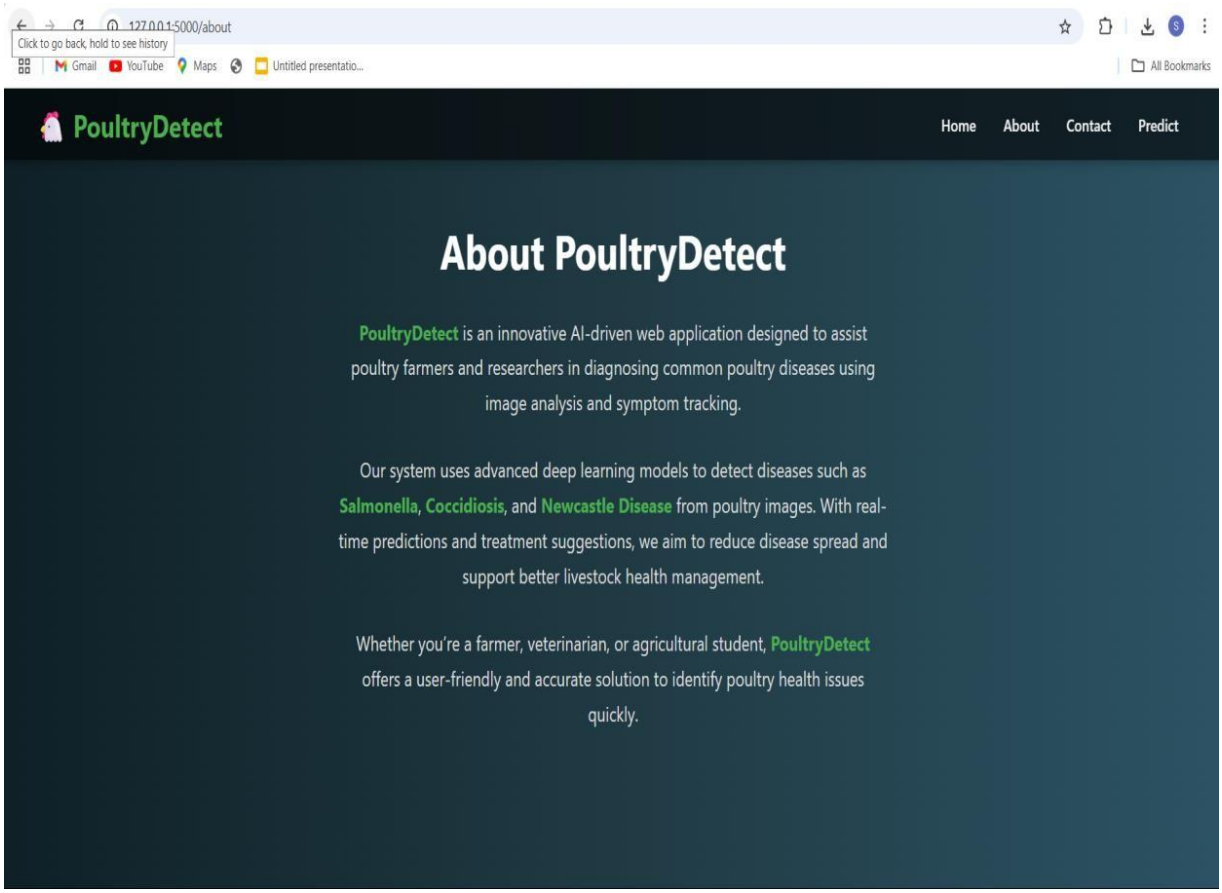
- Expand the model to cover more poultry diseases.
- Improve dataset diversity with images from different regions and breeds.
- Develop a mobile app version with offline capability for remote farm locations.

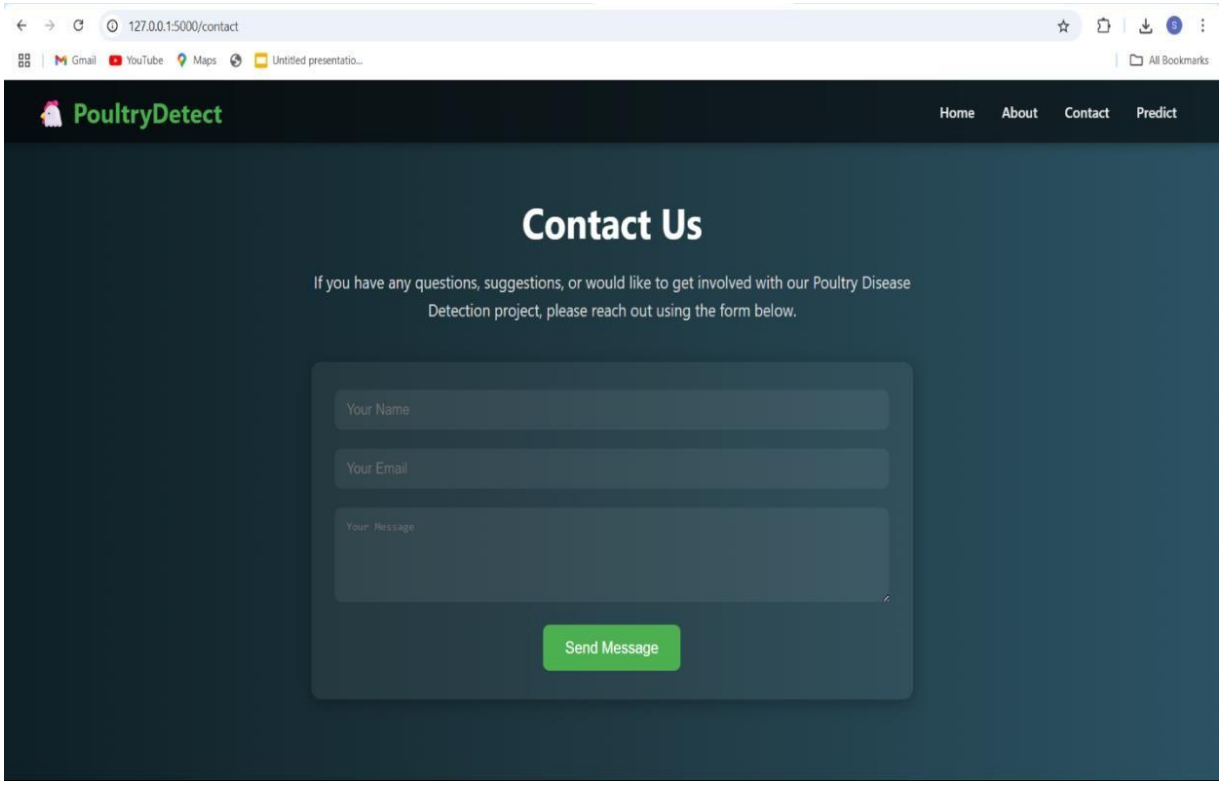
Output:


127.0.0.1:5000
PoultryDetect
Home
About
Contact
Predict
Poultry Disease Detection
COCCIDIOSIS
Start Detection


127.0.0.1:5000/predict_page
PoultryDetect
Home
About
Contact
Prediction
AI-Powered Disease Prediction
Live Camera
Start Camera
Upload Image
Choose File
No file chosen
Predict from Upload


127.0.0.1:5000/predict_page
PoultryDetect
Home
About
Contact
Prediction
Live Camera
Start Camera
Capture
Predict from Camera
127.0.0.1:5000/predict
PoultryDetect
Home
About
Contact
Prediction
Prediction Result
Disease Detected: New Castle Disease
Treatment Recommendation: Isolate birds and apply ND vaccine immediately.
This result is generated using advanced AI-based image recognition trained on poultry disease datasets. It aims to assist in early detection and response. Please consult a veterinary expert for professional treatment guidance.


127.0.0.1:5000/about
Click to go back, hold to see history
Gmail
YouTube
Maps
Untitled presentatio...
All Bookmarks
PoultryDetect
Home
About
Contact
Predict
About PoultryDetect
PoultryDetect is an innovative AI-driven web application designed to assist poultry farmers and researchers in diagnosing common poultry diseases using image analysis and symptom tracking.
Our system uses advanced deep learning models to detect diseases such as Salmonella, Coccidiosis, and Newcastle Disease from poultry images. With real-time predictions and treatment suggestions, we aim to reduce disease spread and support better livestock health management.
Whether you're a farmer, veterinarian, or agricultural student, PoultryDetect offers a user-friendly and accurate solution to identify poultry health issues quickly.


127.0.0.1:5000/contact
Gmail
YouTube
Maps
Untitled presentatio...
All Bookmarks
PoultryDetect
Home
About
Contact
Predict
Contact Us
If you have any questions, suggestions, or would like to get involved with our Poultry Disease Detection project, please reach out using the form below.
Your Name
Your Email
Your Message
Send Message

Conclusion :

This project successfully demonstrates the potential of transfer learning to accurately and efficiently classify common poultry diseases using images, providing farmers with a practical and affordable tool for early disease detection. By enabling timely diagnosis, the solution can help reduce poultry mortality, lower financial losses, and improve overall flock health management.

The user-friendly web application makes the technology accessible even to farmers with limited technical skills, bridging the gap between advanced AI models and practical, real-world needs in the poultry industry.

APPENDIX

- GitHub Repository:
https://github.com/PUjwala05/poultry-disease-classification.git

DEMO Link :

https://drive.google.com/file/d/1EGqYUsZs15poNJfR5RKzw9ftoPQO0nJU/view?usp=d rivesdk