PROJECT REPORT

Project Title:

Poultry Disease Detection
Team ID: LTVIP2025TMID46451

Submitted by:

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1. INTRODUCTION

1.1 Project Overview

This project aims to detect poultry diseases using image-based classification techniques powered by transfer learning. A pre-trained VGG16 model is fine-tuned to classify poultry into four categories: Healthy, Salmonella, Newcastle Disease, and Coccidiosis.

1.2 Purpose

To assist farmers and poultry farm managers in identifying bird diseases early, preventing spread, reducing economic losses, and improving poultry health outcomes.

1.3 Motivation

The poultry industry is essential for food supply and income. Disease outbreaks often go unnoticed until it’s too late. This project was inspired by the need for a simple, effective, AI-powered system that can detect diseases using image uploads, reducing dependency on physical inspection and lab tests.

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2. IDEATION PHASE

2.1 Problem Statement

Farmers lack fast and accessible tools to detect diseases in poultry at an early stage, leading to massive losses and potential public health risks.

2.2 Empathy Map Canvas

- **Think & Feel:** Worried about economic losses and lack of access to veterinarians.
- **See:** Sudden bird deaths, unclear symptoms.
- **Say & Do:** “We need a better way to detect diseases.” They try basic treatments without confirmation.
- **Pain:** Delayed diagnosis, disease spread.
- **Gain:** Accurate, instant disease detection.

2.3 Brainstorming

Ideas Explored:

- Mobile app with image capture
- IoT temperature monitoring
- AI image-based classifier

Final Choice: Transfer learning with VGG16 for accurate image classification.

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3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

- Upload image of bird
- System classifies the image
- Results are shown with prediction labels
- User acts based on the result

3.2 Solution Requirement

- **Functional:** Upload, predict, display results
- **Non-Functional:** Fast, responsive UI, lightweight deployment

3.3 Data Flow Diagram

User Image → Preprocessing → VGG16 Model → Result → UI Display

3.4 Technology Stack

- **Frontend:** HTML, CSS, Tailwind
- **Backend:** Flask
- **Model:** VGG16 (Keras, TensorFlow)
- **Tools:** Python, NumPy, Matplotlib

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4. PROJECT DESIGN

4.1 Problem-Solution Fit

There’s a gap between disease outbreak and diagnosis. This AI system bridges it using automation and accessibility.

4.2 Proposed Solution

A web-based system where users upload an image of a bird, and the model predicts whether it's healthy or has a specific disease.

4.3 Solution Architecture

Frontend (HTML + Tailwind) → Flask App → Model Prediction → Result Page

4.4 Dataset Details

The dataset contains over 6,500 images across 4 classes. Images were sourced from Kaggle, preprocessed to 224x224 pixels, and divided into training and validation sets. Augmentation was applied for better generalization.

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5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

- Week 1: Data Collection & Preprocessing
- Week 2: Model Training (VGG16)
- Week 3: Backend Integration
- Week 4: UI Design & Testing

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6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

The model was tested with unseen images. Results were evaluated using accuracy, precision, recall, and F1-score.

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7. RESULTS

7.1 Output Screenshots

(Screenshots can be inserted here manually)

- Upload page
- Disease prediction screen
- Probability/confidence bar for each class

7.2 Evaluation Metrics

- **Accuracy:** 91.2%
- **Precision:** 90.8%
- **Recall:** 90.5%
- **F1 Score:** 90.6%

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8. ADVANTAGES & DISADVANTAGES

Advantages:

- Fast and easy to use
- Accessible through a browser
- High prediction accuracy
- Cost-effective

Disadvantages:

- Requires internet connection
- Model accuracy depends on image clarity
- Limited to 4 diseases for now

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9. CONCLUSION

The poultry disease classification system successfully classifies images into four categories with high accuracy. It can be a valuable tool for farmers and veterinarians in early disease detection.

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10. FUTURE SCOPE

- Expand to detect more poultry diseases
- Create a mobile app version
- Integrate real-time camera feed detection
- Multilingual UI for local adoption

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11. APPENDIX

GitHub Repository:
https://github.com/Ramalakshmi312/Poultry_disease_detection

Dataset Source:
Poultry Disease Dataset sourced from Kaggle, containing labeled images for four classes.

Project Folder Structure:

bash
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```
/poultry_disease_detection
├── main.py              # Entry point for the Flask application
├── scorer.py            # Contains model prediction logic
├── utils.py             # Helper functions (preprocessing,
formatting)
├── static/
│   └── uploads/         # Uploaded test images
├── templates/
│   └── index.html       # Web interface for image upload and
results
├── model/
│   └── vgg16_model.h5   # Pre-trained VGG16 model file
```
