

# TRANSFER LEARNING-BASED CLASSIFICATION OF POULTRY DISEASES FOR ENHANCED HEALTH MANAGEMENT

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Submitted by

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## 1. INTRODUCTION

### 1.1 Project Overview

This project aims to develop a mobile-friendly, AI-powered poultry disease diagnosis system using transfer learning. It classifies images into four categories: Salmonella, Newcastle Disease, Coccidiosis, and Healthy. This system improves early detection, reduces economic losses, and enhances poultry health management.

### 1.2 Purpose

To enable farmers and poultry handlers to identify diseases using only fecal images via a simple mobile interface, providing real-time, affordable, and accurate disease classification.

## 2. IDEATION PHASE

### 2.1 Problem Statement

Farmers often lack access to timely veterinary services and lab testing. This delay in diagnosis leads to disease spread and financial losses. There is a need for a rapid, low-cost diagnostic tool.

### 2.2 Empathy Map Canvas

Says: "I need a faster way to identify what's wrong with my poultry."

Thinks: "Lab tests take too long and cost too much."

Feels: Frustrated, anxious about livelihood.

Does: Uses mobile phone for basic tasks; lacks veterinary knowledge.

### 2.3 Brainstorming

Ideas evaluated:

- Image-based disease recognition
- Symptom-based chatbot
- Smart wearable for chickens (rejected due to impracticality)

Finalized idea: Mobile app using transfer learning to classify fecal images.

## 3. REQUIREMENT ANALYSIS

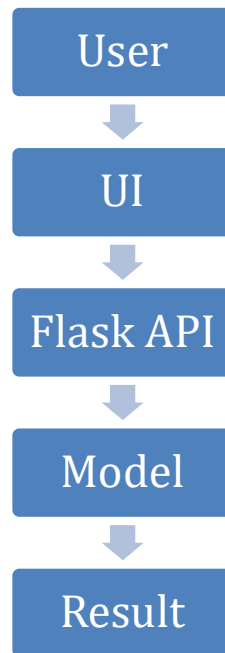
### 3.1 Customer Journey map

Step	Action	Experience
1	Capture image	Easy with mobile
2	Upload to app	User-friendly UI
3	Get prediction	Fast, clear result
4	Take action	Suggested remedies

### 3.2 Solution Requirement

Dataset with annotated fecal images  
Pre-trained CNN models  
Flask backend for inference  
Simple frontend with image input

### 3.3 Data Flow Diagram



### 3.4 Technology Stack

Python, Flask  
TensorFlow/Keras  
HTML/CSS (UI)  
Google Colab(Not Used)/VS Code(Used) (training)

## 4. PROJECT DESIGN

### 4.1 Problem Solution Fit

The model addresses a major gap in accessible poultry healthcare by giving immediate diagnosis capability to farmers via smartphones.

### 4.2 Proposed Solution

Transfer learning-based image classifier (MobileNetV2/VGG16) trained on poultry fecal images to predict the disease class.

## 4.3 Solution Architecture



## 5. PROJECT PLANNING & SCHEDULING

### 5.1 Project Planning

Date	Task
June 9	Defined problem and tech stack
June 10-12	Collected and prepared dataset
June 13-15	Image preprocessing and augmentation
June 16-18	Implemented VGG16 and MobileNetV2
June 19-21	Model evaluation and hyperparameter tuning
June 22-23	Flask integration
June 24-25	Frontend HTML page creation
June 26	Testing model with UI
June 27	Final evaluation and screenshots
June 28	Documentation and GitHub upload

## 6. FUNCTIONAL AND PERFORMANCE TESTING

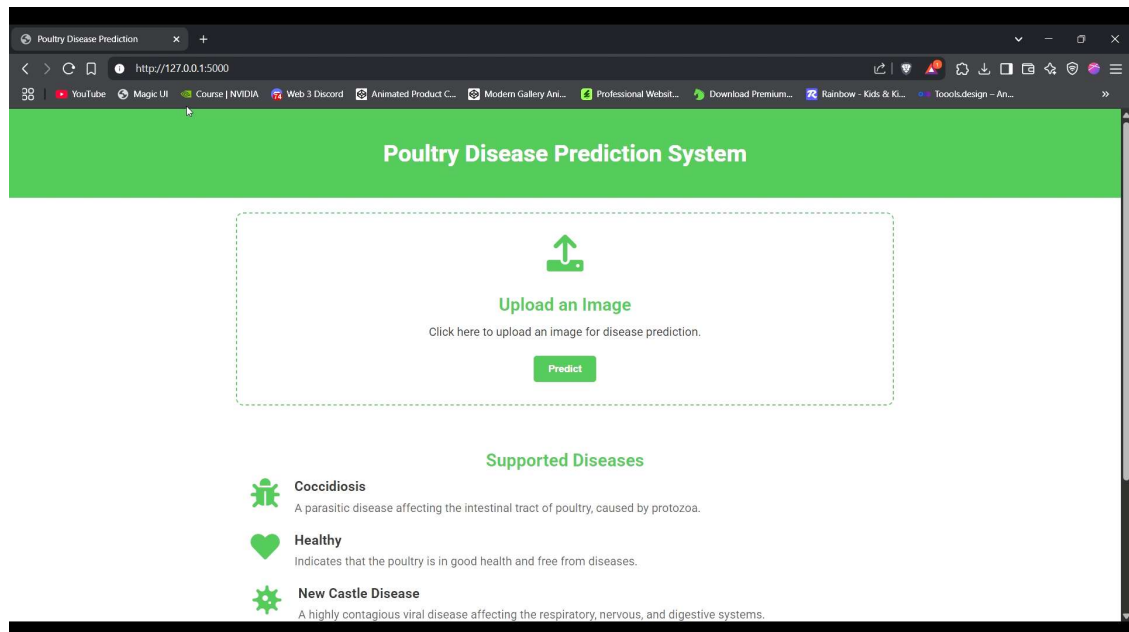
### 6.1 Performance Testing

Accuracy: ~97% (MobileNetV2)  
Precision/Recall/F1 evaluated with confusion matrix  
Lightweight inference time for real-time prediction

## 7. RESULTS

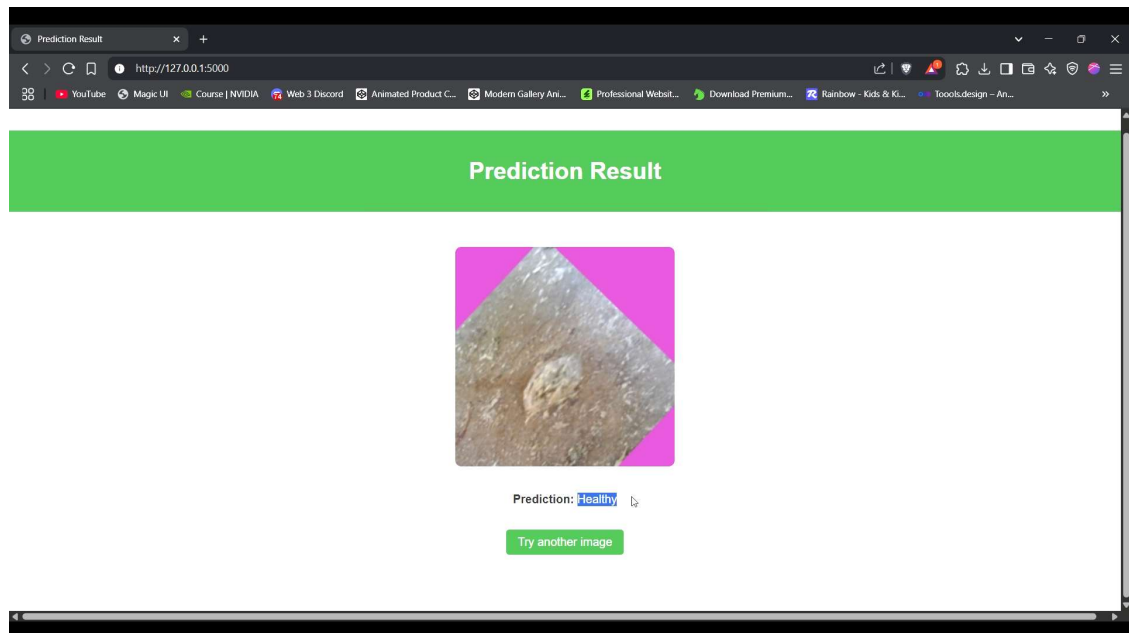
### 7.1 Output Screenshots

Screenshot 1: Home Page



## Image Upload

## Screenshot 2: Predicted Result Displayed



## 8. ADVANTAGES & DISADVANTAGES

### Advantages

- Real-time, accessible, and low-cost
- Lightweight and mobile-compatible
- High accuracy with minimal training data

### Disadvantages

- Limited by quality of training data
- May not work with new/unseen environments
- Needs GPU for initial training

## 9. CONCLUSION

### Conclusion

This system demonstrates that transfer learning can effectively classify poultry diseases from fecal images with high accuracy. Its integration into a mobile app provides a practical solution for farmers.

## 10. FUTURE SCOPE

### Future Enhancements

- Add more diseases
- Convert to TensorFlow Lite for mobile deployment
- Add multilingual support and GPS-based recommendations

## 11. APPENDIX

### Source Code

<https://github.com/Durgesh-Vaigandla/Classification-of-Poultry-Diseases/>

### Dataset Link

<https://www.kaggle.com/datasets/chandrashekarnatesh/poultry-diseases>

### Demo Link

Google Drive link (public) –

<https://drive.google.com/file/d/186y9ZKB6nIT2M6kWaFdqzJxcCw4DQNUO/view?usp=sharing>