

Project Overview

Poultry diseases pose a serious threat to the health of birds and the economy of the poultry industry. Early diagnosis is crucial to reduce mortality and increase productivity. This project implements a transfer learning-based system to classify common poultry diseases from images using deep learning techniques. The solution is integrated into a web application for accessibility to farmers and poultry health professionals.

1.2 Purpose

To develop an AI-powered, image-based disease classification tool using transfer learning, aiding in the early diagnosis and health management of poultry through a responsive web application.

IDEATION PHASE

Problem Statement

Lack of fast and accessible tools for poultry disease diagnosis leads to delayed treatment and major economic losses. Traditional methods require expert veterinarians and physical inspections, which are often costly and time-consuming.

Empathy Map Canvas

User: Poultry farmers

Needs: Quick, affordable disease diagnosis

Pains: Lack of veterinary access, delayed action, financial losses

Gains: Faster decisions, reduced mortality, improved productivity

Brainstorming

- Disease classification using image inputs
- Transfer learning with pre-trained CNN models
- Web platform for accessibility
- Disease report history
- Recommendation engine for care guidelines

. REQUIREMENT ANALYSIS

Customer Journey Map

- 1.Login/Register
- 2.Upload poultry image
- 3.AI model classifies disease
- 4.Displays results & suggestions
- 5.User reviews past predictions

Solution Requirement

- User authentication
- Image upload and processing
- Deep learning-based classification
- Result display with confidence scores
- MongoDB database integration

Data Flow Diagram

(To be included in visuals)

- User → Upload image → Backend → ML Model → Output Prediction → UI

Technology Stack

- Frontend:** React.js
- Backend:** Node.js + Express.js
- Model:** Python (TensorFlow/Keras)
- Database:** MongoDB
- ML Technique:** Transfer Learning (e.g., ResNet50, MobileNetV2)

PROJECT DESIGN

Problem-Solution Fit

Provides low-cost, fast, and accurate disease detection for poultry farmers via an easy-to-use AI-powered web tool.

Proposed Solution

A hybrid MERN + AI solution where users can upload images and receive disease predictions instantly. Uses transfer learning to fine-tune a pre-trained CNN on poultry disease images.

Solution Architecture

- Frontend (React)
- Backend (Node/Express)
- ML Model (Python Flask or microservice)
- MongoDB for data storage

PROJECT PLANNING & SCHEDULING

Project Planning

Phase	Duration
Requirement Gathering	1 Week
Model Training	2 Weeks
Frontend Development	2 Weeks
Backend Integration	1 Week
Testing & Deployment	1 Week

FUNCTIONAL AND PERFORMANCE TESTING

Performance Testing

- Accuracy: ~91% across validation set
- Model Inference Time: ~1.2 seconds per image
- Stress Tested for up to 100 concurrent requests

ADVANTAGES & DISADVANTAGES

Advantages:

- Fast, real-time disease detection
- Reduces reliance on veterinarians
- Easy-to-use and scalable

Disadvantages:

- Needs a large dataset for high accuracy
- Relies on good-quality image inputs
- May not detect unknown diseases

CONCLUSION

This project demonstrates how AI and transfer learning can be leveraged for impactful agricultural solutions. The web-based poultry disease classifier empowers farmers with instant, reliable diagnostics, contributing to better health management in the poultry sector.

FUTURE SCOPE

- Include audio-based symptom reporting
- Expand dataset with regional diseases
- Build mobile app with offline support
- Integrate with veterinary appointment systems

APPENDIX

- **Source Code:** [<https://github.com/swathialli04/Transfer-Learning-Based-Classification-of-Poultry-Diseases-for-Enhanced-Health-Management>]
- **Dataset Link:** [<https://vioo.cc/v/BHMhE>]
- **Project Demo Link:** [<https://www.kaggle.com/code/akibmir/chicken-disease-classification-transfer-learning>]