Project Report: Poultry Disease Detection Using Transfer Learning

# 1. Project Title

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

# 2. TEAM Details

Name: GOGI NADEESA RAHUL

GREESHMA

CHAITHANYA

BHARATH

# 3. Abstract

This project aims to develop a deep learning-based image classification system that helps detect common poultry diseases—Salmonella, Newcastle Disease, Coccidiosis, and Healthy—from uploaded images. Using EfficientNetB0 via transfer learning, the system is trained on a custom dataset of over 6000 labeled poultry images. The model is deployed via a user-friendly Flask web application, allowing users (primarily farmers and veterinarians) to upload images and receive fast, reliable disease predictions.

# 4. Problem Statement

Poultry farmers often lack immediate access to veterinary expertise, which delays accurate diagnosis and treatment. Early detection of poultry diseases is essential to reduce bird mortality and ensure sustainable poultry production. Manual inspection is time-consuming and error-prone. There is a pressing need for a scalable, automated, image-based diagnosis tool.

# 5. Objectives

• Develop a deep learning model capable of detecting poultry diseases from images.  
• Train the model using a labeled dataset containing 4 classes.  
• Build a Flask-based web interface for image uploads and instant predictions.  
• Provide disease-specific treatment advice alongside predictions.

# 6. Dataset Details

• Source: [Mention source or if custom-collected]  
• Total Images: ~6000 images  
• Categories: Coccidiosis, Healthy, Newcastle Disease, Salmonella  
• Image Format: .jpg, .png  
• Image Size (Resized): 224x224 pixels

# 7. Tools and Technologies

Python, TensorFlow, Keras, Flask, HTML5, CSS3, Bootstrap, Jupyter/VS Code

# 8. Model Details

Model:EfficientNetB0  
Training:  
•LossFunction:categorical\_crossentropy  
•Optimizer:Adam  
•Epochs:15–30  
•ImageAugmentation:Yes  
Architecture:  
•GlobalAveragePooling  
•Dense(128,relu)Dropout(0.3)  
• Dense(4, softmax)

# 9. Web Application Workflow

1. User uploads a poultry image via the browser.  
2. Flask receives the file and stores it temporarily.  
3. The image is passed to the trained model.  
4. The model returns the predicted disease and confidence score.  
5. The result and suggestions are shown on the webpage.

# 10. Results

• Accuracy Achieved: ~92%  
• Inference Time: < 2 seconds per image  
• Interface: Responsive, fast, and mobile-friendly

# 11. Testing & Evaluation

Model was tested on 500+ unseen images. False positives/negatives were manually reviewed. The application was user-tested by non-technical individuals.

# 12. Challenges Faced

• Class imbalance in training data  
• Overfitting on small dataset  
• Getting accurate labeling for all images  
• Model bias toward 'Healthy' class (resolved with augmentation)

# 13. Conclusion

This project successfully demonstrates the potential of deep learning in poultry health management. The system provides a fast, accessible, and scalable method for farmers and veterinarians to detect and manage common poultry diseases through a simple image upload interface.