Transfer Learning-Based Classification of Poultry Diseases for Enhanced Detection

Abstract

This project explores the use of transfer learning models to accurately classify poultry diseases using image data. The goal is to improve early disease detection and reduce poultry mortality.

Introduction

Poultry farming is a significant industry. Early diagnosis of diseases can reduce losses. Deep learning has shown promise, but training from scratch is resource-intensive. Transfer learning addresses this challenge.

Literature Review

Several studies have used CNNs and pre-trained models like VGG16 and ResNet. These models achieve high accuracy on limited datasets by transferring knowledge from large-scale datasets.

Methodology

Images of diseased poultry were collected and labeled. Pre-trained models (e.g., ResNet50) were fine-tuned. Data augmentation and normalization were applied to improve generalization.

Dataset Description

The dataset includes images of healthy and diseased poultry. Categories include Newcastle Disease, Fowl Pox, and Coccidiosis. Data was split into training, validation, and test sets.

Model Used

ResNet50 was chosen for its balance of accuracy and efficiency. The final layers were replaced and

fine-tuned for classification of poultry diseases.

Results

The fine-tuned model achieved an accuracy of 92% on the test set. Confusion matrices and ROC curves indicated strong model performance.

Conclusion

Transfer learning is effective for poultry disease classification. Future work may include real-time deployment and more disease categories.

References

1. He et al., 2016. Deep Residual Learning for Image Recognition. 2. Simonyan and Zisserman, 2014. Very Deep Convolutional Networks for Large-Scale Image Recognition.