

Team Information

Team ID: LTVIP2025TMID41443

Team Size: 4

Team Leader:

- Boddu Venkateswara Rao

Team Members:

- Bolla Mahendra
- Bommanaboina Devi Vara Prasad
- Borra Nikhitha

Transfer Learning-Based Classification of Poultry Diseases

This innovative project leverages transfer learning to develop a smart poultry disease classification system. The model categorizes poultry health into four conditions: Salmonella, New Castle Disease, Coccidiosis, and Healthy.

The solution integrates machine learning with mobile technology, allowing farmers to input data such as symptoms, environmental factors, and biological observations.

The goal is to provide immediate diagnosis and treatment guidance, improving poultry health outcomes and farm productivity.

Objectives and Methodology

Key Objectives:

- Build an accurate deep learning model using transfer learning techniques.
- Classify diseases based on input data: symptoms, environmental conditions, biological samples.
- Deploy the model into a mobile application for ease of access by farmers.
- Recommend appropriate treatment and management strategies.

Methodology:

- Use pre-trained CNNs (e.g., ResNet, MobileNet) for feature extraction.
- Fine-tune the model with poultry-specific datasets.
- Collect and label data from field experts and veterinary sources.
- Design a mobile interface for real-time user interaction and diagnosis.

Scenario 1: Outbreak in a Rural Community

A rural village depends on backyard poultry farming as a primary income source. A sudden rise in sick birds causes panic.

Symptoms observed: lethargy, diarrhea, reduced egg production. No nearby veterinary services are available.

Action:

- Farmers use the mobile app to report symptoms and conditions.
- The app classifies the illness as Coccidiosis using the trained model.
- Immediate treatment and preventive guidelines are provided.

Impact:

- Quick response limits the disease spread.
- Saves livestock and farmer income.
- Enhances trust in digital health tools.

Scenario 2: Commercial Poultry Farm Management

A commercial farm integrates the AI-based disease detection system as part of its health surveillance.

Routine data collection reveals unusual symptoms in a segment of the flock.

Action:

- App identifies New Castle Disease through real-time analysis.
- Immediate isolation protocols are enacted.
- Veterinary assistance is sought for confirmation and large-scale intervention.

Impact:

- Outbreak contained within hours.
- Reduced financial loss and mortality.
- Reinforces value of proactive disease monitoring using technology.

Scenario 3: Veterinary Training and Education

Veterinary institutions adopt the mobile app as an educational tool for students.

Students interact with real-world case data and hypothetical scenarios.

The system simulates diagnoses based on input parameters, guiding them through logical reasoning and decision-making.

Features:

- Access to disease databases.
- Simulated diagnostics with feedback.
- Exposure to current digital diagnostic tools.

Outcome:

- Students gain confidence using AI-based platforms.
- Preparedness for fieldwork improves.
- Supports modern veterinary curriculum standards.

Conclusion and Future Prospects

This project successfully demonstrates the use of transfer learning and mobile AI to classify and manage poultry diseases.

Benefits:

- Enhances early disease detection.
- Reduces dependency on in-person veterinary services.
- Improves poultry health and farmer productivity.

Future Directions:

- Expand disease categories to include Avian Influenza, Infectious Bronchitis, etc.
- Integrate image-based diagnostics using deep CNN models.
- Offer support in multiple local languages.
- Connect farmers with veterinarians and suppliers in-app.

Vision: A smarter, healthier, and more sustainable poultry industry powered by AI.

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