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

Team Name:

"The Feature Engineers"

Team Members:

1. Chitturi Jayasree
2. Chennakesavula Yuva Ramachandra
3. Chembeti Sravanthi
4. Chikkavarapu Harika

Phase 1: Brainstorming & Ideation

Problem Statement: Poultry farmers face difficulties in identifying diseases in chickens early, which can lead to large-scale infections and economic losses.

Proposed Solution : We propose an AI-based image classification system using Transfer Learning (ResNet50) to detect poultry diseases such as Coccidiosis, Salmonella, and Newcastle Disease from images.

Target Users: Poultry farmers, veterinarians, and agricultural researchers.

Expected Outcome: An easy-to-use web platform where users can upload a poultry image and receive instant disease classification feedback.

Phase 2: Requirement Analysis

Technical Requirements:

- Python, Flask

- TensorFlow / Keras

- HTML, CSS (for frontend)

- ResNet50 model

- VS Code is used for model training and also for creation of web interface
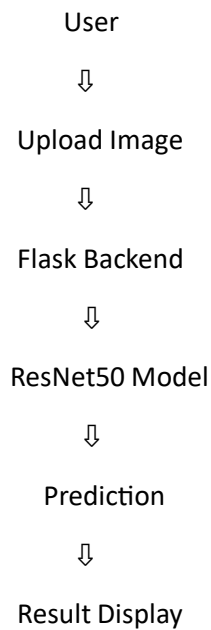
Functional Requirements:

- Upload image

- Predict disease using trained model

- Display result
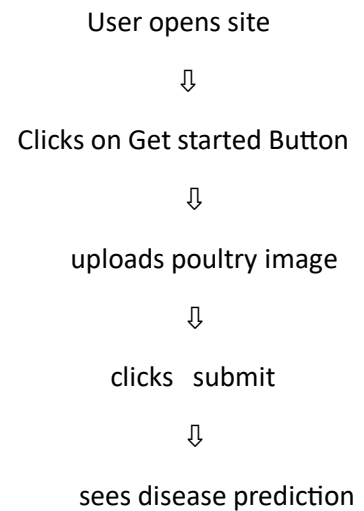
Constraints & Challenges:

- Model accuracy depends on dataset quality.

- Limited labelled images for some rare diseases.

Phase 3: Project Design

- **System Architecture Diagram:**   **User Flow:**

User	User opens site
⇩	⇩
Upload Image	Clicks on Get started Button
⇩	⇩
Flask Backend	uploads poultry image
⇩	⇩
ResNet50 Model	clicks submit
⇩	⇩
Prediction	sees disease prediction
⇩	
Result Display	

UI/UX Considerations:

- Simple upload form with image preview

- Predict button

- Result section with Disease Name

Phase 4: Project Planning (Agile Methodologies)

- **Sprint Planning:**

  - Week 1: Dataset collection & preprocessing

  - Week 2: Model training and tuning

  - Week 3: Flask integration

  - Week 4: Frontend + Testing + Deployment

- **Task Allocation:**

  - Member A: Model training

  - Member B: Flask backend

  - Member C: Frontend UI

  - Member D: Documentation & Testing

- **Timeline & Milestones:**

    - Milestone 1: Dataset ready (Week 1)

    - Milestone 2: Model trained (Week 2)

    - Milestone 3: Web integration (Week 3)

    - Milestone 4: Testing + Report (Week 4)

Phase 5: Project Development

- **Technology Stack Used:**   Python, Flask, TensorFlow/Keras, ResNet50, HTML/CSS
- **Development Process:**
    - Trained ResNet50 on poultry dataset
    - Created app.py with prediction route
    - HTML templates for UI
    - Uploaded image saved and pre-processed
    - Model predicts and result shown on predict.html

Challenges & Fixes:

- ResNet50 needed image shape fixing → solved with img_to_array & resizing

- File not saving correctly → fixed with os.path.join()

- Styling issues fixed via HTML template updates

Phase 6: Functional & Performance Testing

Test Cases Executed:

- Uploaded valid/invalid image formats

- Checked correct predictions for known test images

- UI responsiveness and error handling

Bug Fixes & Improvements:

- Fixed image upload not found bug

- Added image preview and file name display

- Improved styling for better UX

Final Validation:

- Project meets objectives of classifying poultry disease accurately

- Easy for non-technical users