**RESEARCH ARTICLE**                                              **OPEN ACCESS**

# Classification and Detection of Chicken Disease Using CNN with Image Classification Technique

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**Abstract**
Artificial intelligence technology in deep learning is one of the popular classification methods. The development of deep learning technology is expected to assist farmers in identifying the types of infectious diseases that attack chickens based on feces images so as to increase production yields. Several infectious diseases that attack chickens can be identified through their feces, including newcastle disease caused by a virus, pullorum caused by bacteria, and coccidiosis caused by parasites. To identify, it is necessary to classify the types of diseases that attack by using images of chicken feces. With deep learning based on Convolutional Neural Network (CNN) in Keras/TensorFlow, the percentage of images that were accurately predicted according to the classification of infectious diseases suffered by chickens was 95.28 percent and less accurate was percent.

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## I. INTRODUCTION

Animal agriculture is extremely important to the world's rising population. Animal products provide nutrient-dense meals that help people of all ages stay healthy in communities all over the world. The agriculture business must continue to improve its efficiency and quantity of production as hu- man demand for animal proteins increases.The most common chicken diseases include fowl cholera, helminth infestation, salmonella infections, avian coccidiosis, and Newcastle dis- ease.Machine learning is now becoming an essential area in the pursuit for human welfare. Various data mining techniques are implemented in different domains. Machine learning and data mining are the most efficient technique of prediction and prevention. We may discuss examples such as poultry industries, medicinal science, weather predictions and so on

## II. EASE OF USE

*A. Introduction about the project*
In India, the poultry industry is estimated to be worth around Rs. 80,000 crore in 2015–2016.Poul- try diseases including Coccidiosis,

Salmonella, and Newcastle can lower chicken productivity if they are not detected early on. The most prevalent diseases in chickens are Coccidiosis, Salmonella, and NewCastle disease.To avoid this, poultry should be examined before eating or selling. The proposed work is a deep learning- based algorithm for illness classification in chickens. To cat- egorize the poultry illnesses, a publically available dataset with several disease classifications is employed. Different complexity, variety, and uneven data availability make the technique more challenging. Following the investigation, we will obtain the accuracy of each method and identify the best results.Attempting 1 the Classification, we will come through a result that will combine that which approach is best to use for this analysis. Eventually many advanced works can be done with the term of data mining. Improving the poultry industry can be huge part for the overall agriculture industry of India. It can bring a huge advancement as well.In this poultry platform various illnesses may be recognized using machine learning technology, and the implementation of ML and data mining approaches are predictable. Colibacillosis poultry disorders Through such

machine learning methods, bacterial illnesses can also be identified. In this current day, beef chicks are one of the main sources of animal and meat protein. The increasing frequency The research of computer vision, imaging process- ing and pattern recognition has made substantial progress during the past several decades. Nowadays, due to availability of large amount of data and sophisticating algorithms such as deep learning, researchers and industries are employing the technique to solve variety of problems ranging from simple object detection up to complex scene understanding. The analysis of chicken droppings by image processing and deep learning for sick bird detection is reported. However the study it limited to detecting the abnormality of the fecal image and does not detect the presence of a disease directly. Similarly, a deep Convolutional Neural Network (CNN) model was developed to diagnose poultry diseases by classifying healthy and un- healthy fecal images with deep learning.

## III. EXISTING SYSTEM AND LIMITATIONS

Implementing a DVC, pipelining system will demand for many multifactor considerations, especially diverse interclass interactions. which are used to detect the pattern of the dataset.

- One of the most important layer of this architecture is convolutional layer as it is used to extract features from the dataset.
- As the Dataset is insufficient the model will produce less accurate classified results

## IV. LITERATURE SURVEY

In 2021. 24th International Conference on Computer and Information Technology(ICCIT). 2021 IEEE (Machine Learn- ing Techniques to Precaution of Emerging Disease in the Poultry Industry) Quach et al. The author has described in their study that, the term called K-means contributes to growth in multi-layer CNN neural networks. Research will further improve on how the model works, classifies more labels and uses in the poultry sector. Walsh et al .The author has expected, we proved the efficiency of machine learning for generating predictive models for enhancing AIV active monitoring systems. Furthermore, once the models have been trained, predictions for large as well as new sets of data can be done rapidly.In advanced computer science diseases like Avian Influenza, Newcastle Disease are harmful to chicken. In order to prevent harmful consequences, it is important to concentrate about poultry infection on our very initial stage. We use a few qualities to evaluate our analysis regarding poultry illness and this attribute is one of the key items of the following disease. Perhaps we

implement eleven machine classifiers to measure analysis by employing the follow- ing technologies, Logistic Regression Classifier, Naive Bayes Classifier, Multilayer Classifier, Stochastic Gradient Classifier, r Random Forest classifier, Bagging Classifier, Decision Tree Classifier, K Nearest Neighbor Classifier, XGB Classifier, AdaBoost Classifier Gradient Boosting Classifier. The method we employed here gives maximum precision.

*A. Conclusion About Literature Survey*

In this research, chicken disease classification will be carried out using deep learning based on convolutional neural network with the help of the TensorFlow framework to predict the health of chickens based on feces images whether they are in health, pullorum, coccidiosis, and newcastle disease. There were 4 class of chicken feces images.The machine learning and data mining algorithm can be used in this kind of research work to precaution the emerging disease in poultry industry. By this kind of work the poultry industry can be prepared from that kind of deadly disease like Avian Influenzas, Newcastle Disease and so on. Developing country like Bangladesh has huge investment in poultry industry. Moreover, poultry indus- try can ensure us animal protein and meat that is so good for human health. Poultry chicken of healthy breed can be a big part of our economics as well. The study we have done here that will be very much helpful for the farm owners as well the whole poultry industry. Every year over 40random diseases. Our research will make a huge impact on this big lose over the year. We have used eleven best machine learning algorithms in this work. All of them work perfectly. Provided acceptable accuracy but among all of them the Random Forest Classifier has generated the most accurate result for the study.Decision Tree Classifier has the best outcome yet.

## V. PROBLEM STATEMENT

Poultry diseases including Coccidiosis, Salmonella, and Newcastle can lower chicken productivity if they are not detected early on. Deep learning algorithms can assist with the early identification of diseases. In this study, a Convolu-tional Neural Network based framework has been proposed to classify poultry diseases by distinguishing healthy and unhealthy fecal images. Unhealthy images can be a sign of the poultry diseases.The proposed methodology allows for fully automated diagnosis. It can validate the conclusions of medical experts and be handled by non-technical staff in basic healthcare facilities in remote areas for the early categorization of poultry

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diseases into different classes.The developed classi- fication architecture is fast and accurate, making it an excellent choice for use in the biomedical field of poultry illness has significant effects on dietary and health habits and economic performance in emerging nations. A rapid increase in common poultry disease like, Colibacillosis, Newcastle disease, chronic respiratory disorder, Avian flu, coccidiosis is followed by several diseases, fowl cholera, fowl pox, nutritional deficiency would result Even deeper responsibilities. Chronic poultry illnesses have been exposed. These circumstances are largely due to the accumulation of infectious diseases in bacteria and viruses and to lack of awareness within the world's poultry population. It needs greater concentrate and more extensive implementation for wealthy nations, cost- effective and preventative poultry disease policies.

## VI. SYSTEM ARCHITECTURE

System design is transition from a user-oriented document to programmers or data base personnel. The design is a solution, how to approach to the creation of a new system. This is composed of several steps. It provides the understanding and procedural details necessary for implementing the system recommended in the feasibility study. Designing goes through logical and physical stages of development, logical design reviews the present physical system, prepare input and output specification, details of implementation plan and prepare a logical design walkthrough. On opening the system interface we have to choose from the options available in the sidebar to select either rating prediction or recommendation system. Each interface has its own inputs which are collected from the user and sent to the respective machine learning model to predict the output, we have used pickled files to obtain faster output in real time for the same purpose. On generating the output we showcase the results on the front end of our system interface.We also have data visualizations using seaborn graphs to show insights of the data.

## VII. IMPLEMENTATION

*A. Technology/Tools/Languages/Frameworks Used*
- **Tensor Flow:** TensorFlow is an open-source machine learning framework developed by Google. It is designed
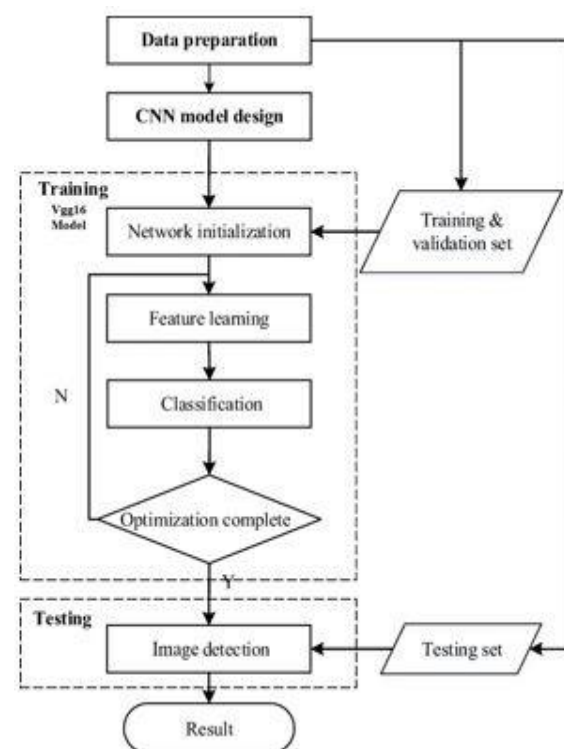
to facilitate the creation, training, and deployment of machine learning models, particularly for deep learning tasks. TensorFlow offers a flexible and comprehensive ecosystem that supports various machine learning and deep learning techniques, including neural networks, natural language processing, image recognition, and more.

- **Pandas**: A powerful data manipulation and analysis library.Pandas is a widely used open-source data manipulation and analysis library for Python. It provides data structures for efficiently storing and manipulating large datasets, as well as tools for working with structured data.It is essential library in the data science and analytics ecosystem, and it is built on top of the NumPy library.

- **DVC**:(Data Version Control): A version control system for machine learning projects that helps manage and version datasets.DVC is not a replacement for traditional version control systems like Git; instead, it complements them by focusing specifically on the versioning and management of large files, such as datasets and model files.

- **Numpy**:A fundamental package for scientific comput- ing with Python, providing support for large, multi- dimensional arrays and matrices. It provides support for large, multi-dimensional arrays and matrices, along with mathematical functions to operate on these arrays. NumPy is a fundamental package for scientific computing in Python and serves as the foundation for many other scientific computing libraries.

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