

Survey on Dairy Livestock Disease Prediction System

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Abstract- Background: This dissertation aims in developing a expert systems for dairy farmers, which can predict livestock diseases and suggest nearby veterinarian. **Methods:** The main purpose of the planned system is to present a livestock disease prediction model for the prediction of occurrence of different disease. For this purpose, machine learning algorithm is used. This system takes the symptoms as input and predicts the disease by using Machine Learning algorithm. For prediction of the disease, we have used non- parametric decision tree algorithm and application programming Interface (API) for nearby veterinarian. **Findings:** At present, when livestock suffers from particular disease, then the doctor has to visit which is time consuming and costly too. Also, if the doctor is out of reach it may be difficult for the farmer as the disease cannot be identified. So, if the above process can be completed using an automated program which can save time and treat the diseases in time, reduce the losses of cattle effectively.

Keywords- Disease Prediction, Livestock Disease, Machine learning, Decision Tree, API.

I. INTRODUCTION

India is the world's highest livestock holder about 512.05 million. Out of which 20.5 million people rely on livestock for their subsistence. In 2020 India imbibe 81 million metric tons of milk; this was made up only by a reason that our animals were healthy. To take care of the health of livestock we are designing this diseases prediction system which will help the user to predict the diseases and to take necessary precautions. If any livestock suffers from the disease, this in turn causes problems like yield of milk may get reduced, and also the economy of the nation. If the acquire disease is a communicable disease that has very high impact on other livestock in the stable. The primary detection of the disease present is very important to overcome the above problems.

In this system, we have used Machine Learning techniques to solve the problems. The model deployed takes the symptoms of the Livestock as input and does the analysis using Machine Learning algorithms to predict the precise disease. This model helps in initial detection of some of the fatal diseases.

II. LITERATURE SURVEY

Mr. Daksh Ashar, Mr. Amit Kanojia, Mr. Rahul Parihar, Prof. Saniket Kudoo, "Livestock Disease Prediction System", 9th National Conference on Role of Engineers in Nation Building – 2021 (NCRENB-2021). The livestock sector plays an important role in the socio-economic development of rural households. A large number of people in India being less literate and unskilled

depend upon agriculture for their livelihoods. Livestock is a source of subsidiary income for many families in India especially the resource poor who maintain few heads of animals. One of the major obstacles in achieving the targeted growth rates in the sector is the prevalence and outbreaks of diseases.

This livestock disease is the great threat to the animal health as well as to human those are in direct contact with animals and who consumes the product of the animal who has been infected by certain disease. Livestock animals usually distribute in remote areas with relatively poor condition of diseases diagnosis rapidly and accurately. It is necessary to detect the disease outcome in the livestock to take the precautionary measures in order to avoid spread amongst them.

There is a need for a system that helps to create awareness among livestock owners about the disease prevailing in the animal and taking the necessary precautions and also making the owner aware that disease can be the reason for death of animals. In the existing system, the disease outbreak among the animals is predicted based on certain condition and it is also concerned to a specific animal and disease. Animal owners are often unaware of whether the disease is mild or might prove fatal and precautions to be taken at appropriate time.

Our proposed system will predict the livestock (Cow, Sheep and Goat) disease based on the symptoms and also provide the precautionary measures on the basis of disease predicted. It will also alert the livestock owner if the predicted disease may cause a sudden death.[1]

Noone Vijay Kishan, Sai Trinath Y, Sandeep Kavalur, Sangamesha V, Mr. Sumanth Reddy, "Cattle disease identification using Prediction Techniques", 2021. As one of the earlier methods of occupation, non-industrial nations such as India, Bangladesh, Nepal and a lot more have dairy farming. Dairy farm automation plays a major role in the expansion of productivity in dairy production. Cattle animals are prone to many diseases, some of which can decrease productivity and lower the quality of dairy products and, if not identified at an early stage, can also contribute to the death of cattle, which is greatly impeded by the sustainable development of the national economy. This paper presents a technique that explains how the use of IOT and data mining can diagnose cattle diseases that are rare in farm animal medical facilities that can have cost-effective medical solutions.

The method discussed in this paper deals with an approach to providing a broad database of hardware that contains symptoms and records of various health care conditions that can report and document the health condition. With the aid of data mining strategies to classify the situation, this can be done and offers a prediagnosis of the issue with data obtained from sensors that are paired with the internal database. The technology allows early diagnosis of the disease and can avoid delays in the recognition of heinous diseases. The system further conducts an intelligent examination of a hardware device's sensor data and detects whether or not the cattle is suffering from a disease.

The system uses multiple sensors such as temperature, vibration accelerometers, etc. to measure. In order to generate results from the obtained data, the method utilizes the intelligent analysis mechanism functionality of data mining. This program is a first aid mechanism that analyzes the signs to send you results with algorithms for the detection of cattle diseases on the basis of data computation.[2]

III. PROPOSED SYSTEM

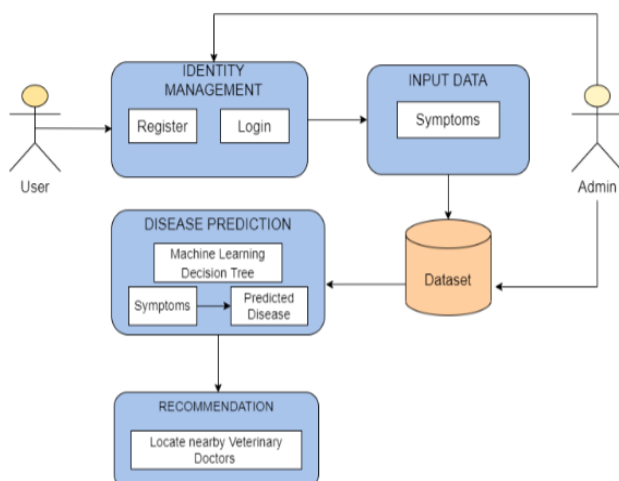


Fig 1. Proposed System.

1. Proposed Algorithm:

- **Step 1:** Register the user or login if already registered.
- **Step 2:** Get the symptoms as input from the user and process.
- **Step 3:** Apply Decision tree algorithm on input and it will predict the disease.
- **Step 4:** The system will show the predicted disease, its causes and precautionary measures.
- **Step 5:** User can search for nearby veterinary doctor.

IV. METHODOLOGY

1. Dataset:

We believe that dataset plays a very vital role in machine learning. We have streamlined the data as much as we can which supports the model to train easily and faster. If raw data is used then it should be cleaned before feeding it to the model. To clean the data, we can use several methods to clean the data; there is no definite method here. Our dataset consists of 9 livestock disease with 36 attributes (symptoms).

2. Pre-Processing:

Data preprocessing is a step in the data mining and data analysis process that takes raw data and transforms it into a format that can be understood and analyzed by machine learning model

3. Data Cleaning:

Our dataset may have irrelevant and noisy data which had to clean before used for training.

4. Data split (Train | Test):

When data is ready for model, the final step is to split the dataset into a training and validation set. Here we divide the dataset into 80 % of the training set and 20 % of the validation set and we get this shape of data.

5. User input:

We will accept the symptoms from the user through the user interface.

V. ALGORITHM

1. Decision Tree Classifier:

The decision tree classifiers organized a series of test symptoms and conditions in a tree structure. This path classifies a population into branch-like segments in a tree that construct an inverted tree with a root node, internal nodes, and leaf nodes. If the size of sample is too large, study data can be divided into two sets, that is training and validation data sets. The training data set to build a decision tree model and a validation data set decide on the suitable tree size to obtain the optimal final model.

The Decision tree classifies the given symptoms and predicts a disease. Initially, we will take all symptoms and

put it in an array with the value 1 assigned to these values in the dataset. This is given as an input to the prediction model for predicting the disease. Then this array matches up the disease dataset and lead up to the common leaf node with the highest degree of trust.

In the recursive part, we repeat the above-mentioned approach with increasing tree-level in order to construct the tree. Then it set the current node as a leaf node when the output is published for the symptoms given.

The measurement of node impurity/purity is given by:

- Gini Index
- Entropy

VI. APPLICATIONS

- The expert system will help farmer for primary diagnosis of the cattle disease.
- The expert system will help to search nearby veterinarian.
- The expert system will prevent the spread of cattle disease among other healthy cattle.
- The expert system will save the time and cost of transportation.

VII. CONCLUSION

In this survey, a system which provides a quick way to predict the diseases is proposed. It allows the users to enter symptoms through user interface.

It provides nearby veterinarian which reduce the searching time and quick treatment of disease is possible. It defines the disease prediction using highly personalized training set and tasks like fixing the appointments and tracing the nearest health care.

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