International Journal of Early Childhood Special Education (INT-JECSE)
DOI:10.9756/INTJECSE/V14I5.921 ISSN: 1308-5581 Vol 14, Issue 05 2022

Animal Disease Prediction using Classification Algorithm of Machine Learning

Sakshi
MTech Scholar
Technocrats Institute of Technology (Adv.)
Dr. Neetesh Gupta
Professor
Technocrats Institute of Technology (Adv.)

ABSTRACT: -
Recognizing animals in a picture and naming them to class is called picture division. Programmed picture division has been one of the significant exploration regions which are in pattern these days. Each and every other day another model is being found to improve picture division for the errand of PC vision. As the better a PC can see, the better we can computerize the errands around our day-by-day life. In this study, we are looking at different picture division procedures and based on our examination, we are applying the best way to deal with an application i.e., fostering a model to recognize infected animal and to give a plan to individuals what sort of sickness is available in an animal. The itemized investigation of the philosophy is finished with the assistance of different examination methods, which are utilized concerning the setting of the work. Our emphasis is on the procedures which we can streamline and improve than the one which is available previously. This work underscores the significance of the utilization of picture division methods and to make them more helpful for the normal public in everyday life with the help of classification algorithm. So, they get advantages of this innovation in the observing of movement happening around that isn't possible physically.

Keywords: Image segmentation, Deep Learning, Convolutional Neural Networks, classification etc.

I. Introduction

In the cutting-edge world, pictures are the essential wellspring of data sharing. We can discover them in pretty much every space of work. However, pictures can be perused precisely simply by people as they should be deciphered in a characteristic point of view way. These days, as we probably are aware the innovation has progressed up to a degree to such an extent that it can coordinate with the capacity of the human mind. Presently the translation of pictures by PC is conceivable. Pictures can be perused and protests in it tends to be recognized naturally. In view of those outcomes investigation and programmed dynamic is currently a potential assignment. Different AI innovations have been presented for such assignments, yet CNN (Convolutional Neural Network) ends up being the best procedure to do picture division or item distinguishing proof.

The livestock sector plays an important role in the socio-economic development of rural households. A largenumber of people in India being less literate and unskilled depend upon agriculture for their livelihoods. Livestockis a source of subsidiary income for many families in India especially the resource poor who maintain few headsof animals. One of the major obstacles in achieving the targeted growth rates in the sector is the prevalence andoutbreaks of diseases. This livestock disease is the great threat to the animal health as well as to human those arein direct contact with animals and who consumes the product of the animal who has been infected by certaindisease.

Livestock animals usually distribute in remote areas with relatively poor condition of diseases diagnosis rapidlyand accurately. It is necessary to detect the disease outcome in the livestock to take the precautionary measures inorder to avoid spread amongst them. There is a need for a system that helps to create awareness among livestockowners about the disease prevailing in the animal and taking the necessary precautions and also making the owneraware 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 itis also concerned to a specific animal and disease. Animal owners are often unaware of whether the disease ismild or might prove fatal and precautions to be taken at appropriate time. Our proposed system will predict thelivestock (Cow, Sheep and Goat) disease based on the symptoms and also provide the precautionary measures onthe basis of disease predicted. It will also alert the livestock owner if the predicted disease may cause a suddendeath.

II. RELATED WORK

Ayesha Taranum, et. al. [1], proposed the method which analyses the disease by symptoms and also verify the scan image for determining the diseases in canine. It helps the pet Owners to diagnosis the disease, which minimizes the risk and in minor cases there is no need to contact veterinary. Varun Garg, et. al. [2], provides a

methodology that how the use of machine learning can detect cattle diseases which can provide economical and medical solution to place with scarce in medical facilities for farm animals. The system provides early detection of the disease which can prevent delays in identifying heinous diseases. System further performs an intelligentanalysis from the sensor data of a hardware device and detect whether the cattle is Suffering from a disease or not.

Long Wan, Wenxing Bao, [3], proposed a paper that proved the practicality of support vector machine (SVM)used in the animal disease diagnoses expert system in theory by studying the disease diagnosis expert systembased on SVM. They have designed the model of animal disease diagnoses expert system which was used todiagnose the cow diseases. It shows that the method is practical and effective. And this practice provides a newapproach for animal disease diagnosis.

LijingNiu, Chenhao Yang, et. al. [4], proposed the method which analyses the data of a large number ofelectronic medical records, and use the SVM algorithm in machine learning to classify texts. Then use the datamining association algorithm to correlate the disease of the cattle according to the symptoms of the cattle, andgive corresponding diagnosis and treatment suggestions in time. K. P. Suresh, et. al. [5], provides a method thatis based on the environmental parameters of the particular area, early recognition of a serious or exotic animaldisease can be done which is one of the most important factors influencing the chance of controlling the disease.As many diseases are linked to environmental deterioration and stress associated with farm intensification.

III. METHODOLOGY

The objective of the project is to classify the disease on the basis of the input selected by the user. Also providethe precautionary measures of the disease predicted and alert the livestock owner in case if the predicted diseasemay cause a sudden death. The outcome is to create awareness of the disease that can cause sudden death anytime in future. Providing precautionary measure helps to rehabilitate animal from diseases and also help to stopthe spread of the disease to other animals or people taking care of animals by making the user aware of respectivedisease.

Livestock disease prediction system is used to predict multiple diseases. In order to predict multiple diseasesor different types of disease we require a multi class classification algorithm. Therefore, we have used the SVMalgorithm to prepare the model. Data is collected from various data sources and placed in a single excel file. Itcontains multiple set of the symptoms depending on the animal i.e., Cow, Sheep, Goat. Each dataset contains largenumber of instances. Different Model is prepared for each animal by training with appropriate dataset. Once theuser selects the animal the model for that animal will be loaded and the application will show the list of symptoms.User selects the symptoms he had observed in the animal and submits the data. Then the data from the frontendis passed to the trained model for prediction. The model then predicts the disease and also provides theprecautionary measures. In case if the disease is dangerous, it will also alert the user. The user also has the optionto access the web page in Hindi or English language.

IV. Proposed Work

Here, in this work we have looked at different picture division methods and subsequent to exploring different strategies we have discovered the CNN is one the most incredible asset in picture division procedures. Then, at that point we have applied CNN to the plant's datasets to recognize the sicknesses that may introduce in them. There are as of now different procedures to recognize infections in animals yet possibly they are not programmed or they have almost no precision in them. Along these lines, to give great quality and exact outcomes we have fostered a philosophy that gives high precision just as continuous outcomes which, helps in the early location of Animal disease that can be relieved inside time. We have fostered a CNN-based AI model which can section a picture into different parts and this aide additionally in decreasing the quantity of errands needed for the recognizable proof of illnesses in animals.

V. Problem Statement

Here, we are attempting to distinguish those animals which are experienced some creature tissue infection by taking a gander at their picture tests taken from various points. The fundamental reason for doing this errand is to limit the misfortune that happened because of infection influenced creatures which eventually brings about the development of parasite. For tackling this issue, we are utilizing the picture division procedure with the assistance of CNN's profound neural organization design.

Dataset

The information has been gathered from swarm AI from the Animal Village Disease Classification Challenge. It has been downloaded the dataset utilizing the connection and order. The dataset comprises of legs of different classes of infections found in creatures. In this dataset, every class comprises of around 1000 pictures of similar sort of Animal illnesses. There is a sum of 15 sorts of infections that are utilized to arrange input pictures.

Problem Solution

The pictures which are gathered in the dataset are the entirety of the various types of creatures. Pictures having legs of similar sort of sicknesses are classified into one organizer. Some other time when the model is preparing if any new information comes having similar highlights as these information pictures, then, at that point that picture will likewise get remembered for the current data set. Also, model gets more intelligent by the new highlights of the information picture which may use to sort future info information.

	precision	recall	f1-score	Support
Acne	1.00	1.00	1.00	41
Allergy	1.00	1.00	1.00	50
Arthritis	1.00	1.00	1.00	33
Chronic cholestasis	1.00	1.00	1.00	35
Common Cold	1.00	1.00	1.00	41
Dengue	1.00	1.00	1.00	42
Drug Reaction	1.00	1.00	1.00	37
Fungal infection	1.00	1.00	1.00	46
GERD	1.00	1.00	1.00	42
Gastroenteritis	1.00	1.00	1.00	39

Table 1:- Result Analysis

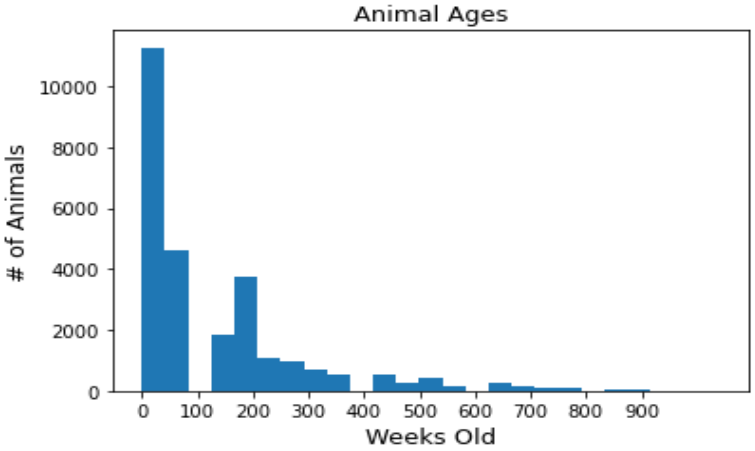

Fig 1:- Analysis of Disease

From the information above, we can see that a more likely outcome for younger animals is to be transferred or adopted, while older animals are more likely to be returned to their owner or euthanized. While the Died outcome has the lowest average age upon outcome, only 0.7% of animals fall into this category. Therefore, we can assume that many of these animals were unhealthy upon birth and died young.

The age variable is explicitly defined as the age upon outcome; we do not know the ages of animals when they entered shelters. We also do not know how long animals were at the shelter prior to their outcome, and we have no insights into animals still in shelters.

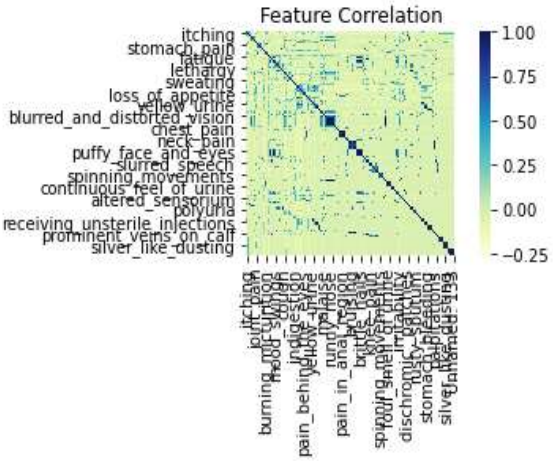

Fig 2:- Feature Corelation Matrix

TRAIN: 21383 and TEST: 5346

For train data:

	precision	recall	f1-score	support
Adoption	0.62	0.88	0.73	8616
Died	0.00	0.00	0.00	158
Euthanasia	0.43	0.10	0.17	1244
Return_to_owner	0.49	0.33	0.39	3828
Transfer	0.73	0.62	0.67	7537
accuracy			0.64	21383
macro avg	0.46	0.39	0.39	21383
weighted avg	0.62	0.64	0.61	21383

For test data:

	precision	recall	f1-score	support
Adoption	0.62	0.86	0.72	2153
Died	0.00	0.00	0.00	39
Euthanasia	0.38	0.08	0.13	311
Return_to_owner	0.44	0.34	0.38	958
Transfer	0.73	0.61	0.67	1885
accuracy			0.63	5346
macro avg	0.44	0.38	0.38	5346
weighted avg	0.61	0.63	0.60	5346

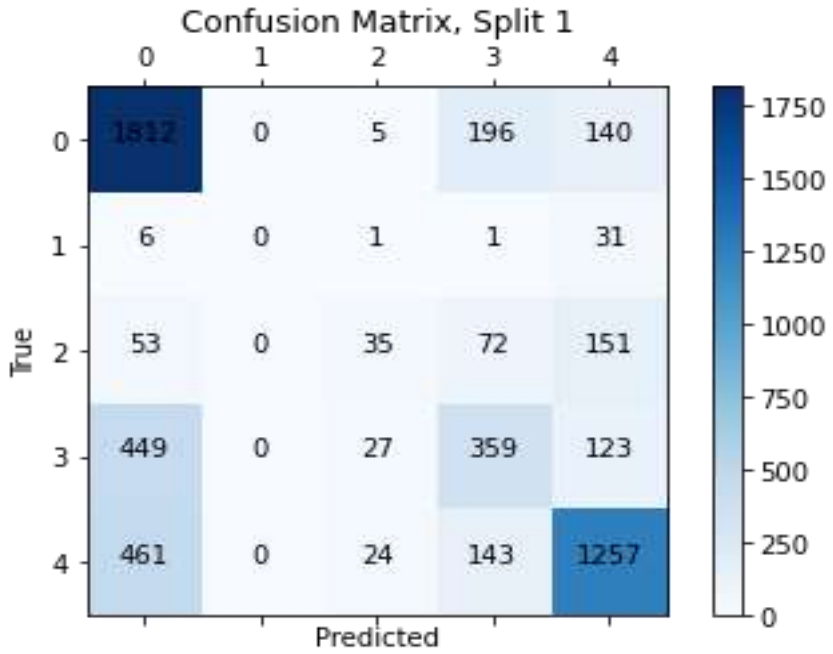

Fig 3:- Confusion Matrix

We will examine logistic regression, random forests, as we refine our parameters and features. We will not continue with individual decision trees.

Throughout all of our analysis, the weighted f1-score was very consistent through each Stratified KFold split, but the generalization issue highlighted our aforementioned data imbalance concerns with some of our outcome classes. We believe that if we work to over or under sample, we might be able to help our algorithm generalize to unseen data. The variance between each f1-score within each model was not large, as all f1-scores were close

to each other within each classifier, so we are not incredibly worried about overfitting. However, we will perform further cross-validation between the test folds to evaluate our specific amount of overfitting.

VI. Conclusion

In this work we have compared various image segmentation techniques and after researching various techniques we have found that the CNN is one the most powerful tool in image segmentation techniques. Detailed analysis of CNN is also done here explaining different layers and workings of each layer. We have explained all the possible advantages and fields where CNN can be used in our daily life. As we know CNN technology is at a boost of implementation nowadays in making the human life more and more convenient and less manual. Yet there is still a lot of work to be done in the making those automatic monitoring systems more accurate and reliable. There is a need to improve the accuracy of such systems to an extent that they can be relied upon to do crucial tasks such as monitoring unidentified activities in restricted areas such as country borders or ministerial offices, where a slightest inaccuracy may prove to be disastrous. Some work also needs to be done in the field of making various implemented model to combine as a one such that they can be fed to a robot by which it can act and do the tasks more intelligently and accurately.

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