BIRD SPECIES IDENTIFICATION USING IMAGE MINING & CNN ALGORITHM

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Abstract – *Now daily some bird species area unit, being found seldom and if found classification of bird species prediction is troublesome. Naturally, birds gift in numerous eventualities seem in several sizes, shapes, colors, and angles from human perspective. Also, human ability to acknowledge the birds through the photographs is additional apprehensible as compared to audio recognition. The humans couldn't ready to predict the bird species name with solely the audio of bird voice. Thus, this methodology uses the Caltech-UCSD Birds two hundred [CUB-200-2011] dataset for coaching likewise as testing purpose. By exploitation deep- convolutional neural network (DCNN) algorithmic rule a picture regenerate into gray scale format to get autograph by exploitation tensor flow, wherever the multiple nodes of comparison area unit generated. These completely different nodes area unit compared with the testing dataset and score sheet is obtained from it. Once analyzing the score sheet it will predicate the specified bird species by exploitation highest score. Experimental analysis on dataset (i.e. Caltech-UCSD Birds two hundred [CUB-200- 2011]) shows that algorithmic rule achieves Associate in Nursing accuracy of bird identification between eightieth and ninetieth. The experimental study is completed with the Windows software employing a Tensor flow library. The system accurately predicts the bird name beside extended info of that specific bird. The user will transfer any image of the bird in our desktop application and our application with success predicts bird name by making certain that bird is gift in our information.*

Key-Words*: *Image Processing, CNN Algorithm, Classification, Visual Studio.

1. INTRODUCTION

Many folks across countries have gotten into this interest of bird-watching as a hobby or extra-curricular activity. In present, it acts as an excellent stress buster and an inexpensive manner of obtaining connected with nature. Another regarding} bird observation is awareness about nature conservation by observant behaviour, migratory pattern, population, and conservation standing of bird species. From conservation purpose of read, it's necessary that a lot of range of individuals flip towards bird-watching and facilitate collect knowledge which will be accustomed study birds. Sometimes, bird identification is troublesome for beginners further as fully fledged bird-watchers. The main target of our project is to additionally alter the identification method. As so much as Asian nation cares, there's no bird identification computer code accessible that takes image as associate input and provides the identity of the bird as output. There area unit bird identification computer code accessible for countries like North American country and Canada (eg. Bird, Merlin Bird ID) however only a few sensible quality bird identification computer code area unit accessible in Asian nation. For beginners, the computer code are going to be of nice facilitate as a result of at the first stages of bird-watching, characteristic or totally differentiating between different species is troublesome and frustrating. Through this computer code the user can gain the information relating to every and each bird species gift in our country. To fully fledged bird-watchers additionally this computer code can majorly.

1.1 NEED

Bird behaviour and population trends became a very important issue these days. Birds facilitate United States of America to notice different organisms within the surroundings (e.g. insects they feed on) simply as they respond quickly to the environmental changes. But, gathering and assembling data regarding birds needs large human effort similarly as becomes a awfully costlier methodology. In such case, a reliable system which will give massive scale process of knowledge regarding birds and can function a valuable tool for researchers, governmental agencies, etc. is needed. So, bird species identification plays a very important role in distinguishing that a specific image of bird belongs to that species. Bird species identification suggests that predicting the bird species belongs to that class by victimization a picture. The identification may be done through image, audio or video. Associate in Nursing audio process technique makes it doable to spot by capturing the audio signal of birds. But, because of the mixed sounds in surroundings like insects, objects from globe, etc. process of such data becomes additional difficult. therefore our desktop application package build use of image and predicts the bird name in conjunction with entire description of that individual bird.

1.2 APPLICATION AND SCOPE

User will get sufficient knowledge of information about each and every bird species present in our database "CALTCH" [CUB-200-2011]. Our desktop application is implemented in order to understand the every common user without any ambiguity of bird's description. The extinct bird

information is also provided in terms of percentage with accurate results.

1.3 AIM:

The aim of our system is to test and train the birds present in the datasets. To train the bird various features are extracted and classified accordingly using CNN algorithm. The output provides the description (i.e. food, environment, habitat, extinct species or not) of the bird.

1.4 PROBLEM STATEMENT

The problem of our system is, it could not able to differentiate between the bird and objects images. Extinct bird species are not predicted by our system only the description is provided that is the bird will be going to extinct in percentage. Our system could not able to produce 100% accurate result.

2. LITERATURE SURVEY

This paper presents a unique approach for bird species classification supported color options extracted from free pictures. This suggests that the birds could seem totally different in several and in numerous situations additionally could gift different poses, sizes and angles of read. Besides, the pictures gift robust variations in illumination and components of the birds could Bird Species Identification mistreatment Image Mining and CNN algorithmic rule be occluded by different parts of the state of affairs. The planned approach 1st applies a color segmentation algorithmic rule in a shot to eliminate background parts and to delimit candidate regions wherever the bird could also be gift inside the image. Next, the image is split into part planes and from every plane, normalized color histograms are computed from these candidate regions. Once aggregation process is utilized to cut back range. The amount of the quantity of the intervals of the histograms to a set number of bins. The bar chart bins are used as feature vectors to by a   learning algorithmic rule to do to differentiate between the various numbers of bird species. Experimental results on the CUB- two hundred dataset show that the segmentation algorithmic rule achieves seventy fifth of correct segmentation   rate. Moreover, the bird species classification rate varies between ninetieth and eight, reckoning on the quantity of categories taken under consideration. Bird species identification from pictures is a very important and difficult downside with several applications within the planet like atmosphere protection and vulnerable animal rescue. There are also another sensible reasons to observe birds. So as to guage the standard of our living atmosphere it's vital to get reliable info concerning the population of untamed animals.

3. REQUIREMENT ANALYSIS

3.1 Functional requirements

System Input: Data that is already hold on within the information is employed as Associate in Nursing input. The user can transfer the image within the desktop application.

Expected Output: The System are going to be able to acknowledge the uploaded bird and provide the outline of the bird.

Expected Behaviour: Acquiring on the premise of the trained knowledge set. All the features square measure extracted from the given image and it's classified supported it.

3.2 Non-functional requirements

Non-functional necessities are those who don't directly have an effect on the functioning of the system however have an effect on, the performances of the system. Non- functional necessities are those necessities, such as, detail constraints, management mechanisms. as an example, time interval of the system. Service level necessities are quality of service that's being measured. the standard of service, is set by, however expeditiously the fruit pictures ar classified. Non- useful necessities might take care of the complete system joined whole system or take care of one useful demand. Identification of realistic, measurable target values for every service level, is another non useful demand.

Accuracy : Accuracy is incredibly vital in any atmosphere. Average accuracy of our gift system is eighty.3%,

Features Extraction: 79%. it might become higher as we have a tendency to tone down coaching |the educational} rate step by step and increase the amount of epochs whereas training the auto-encoders.

Scalability: The system will run swimmingly on any software package like windows, Linux, Ubuntu and raincoat software package

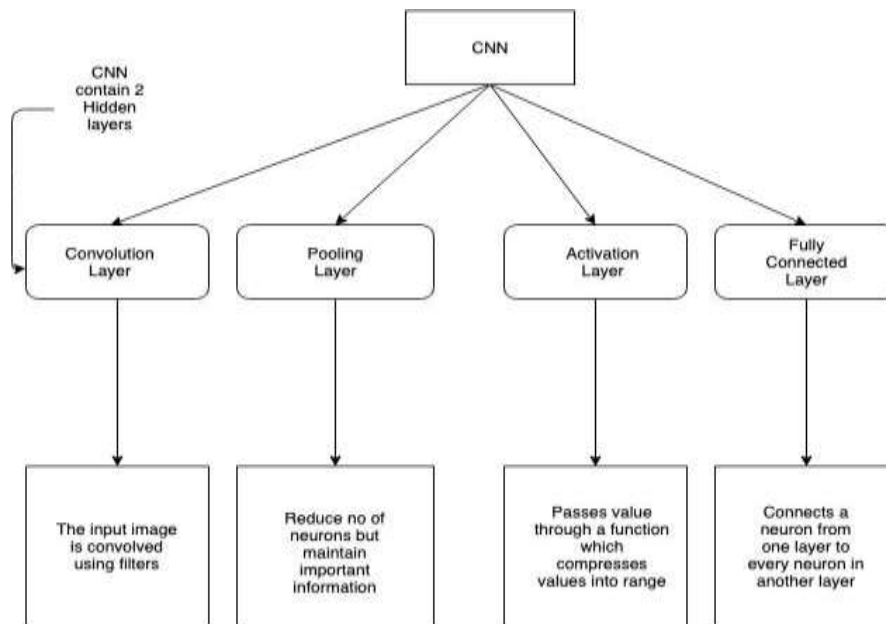Performance: The system runs swimmingly on a laptop with 4GB RAM to 6GB RAM.

4. METHODOLOGY

Fig-1: CNN Block Diagram

CNN is employed for options extraction.CNN consists of four totally different layers. The layers square measure convolution, pooling, activated, totally connected layer. The input image is convolved victimization filters. Filters square measure little matrix. It permits extracting visual options from a picture in little amounts. Pooling is employed to scale back the amount of neurons from previous convolutional layer however maintaining the necessary data. Down sampling of options is finished here

so less options square measure gift to be told throughout coaching. Activation layer passes a worth through a operate that includes values into vary. Totally connected layer connects a nerve cell from one layer to each nerve cell in another layer and a picture is generated. Then Associate in nursing unsupervised algorithmic program known as deep learning victimization. CNN is employed to classify that image.
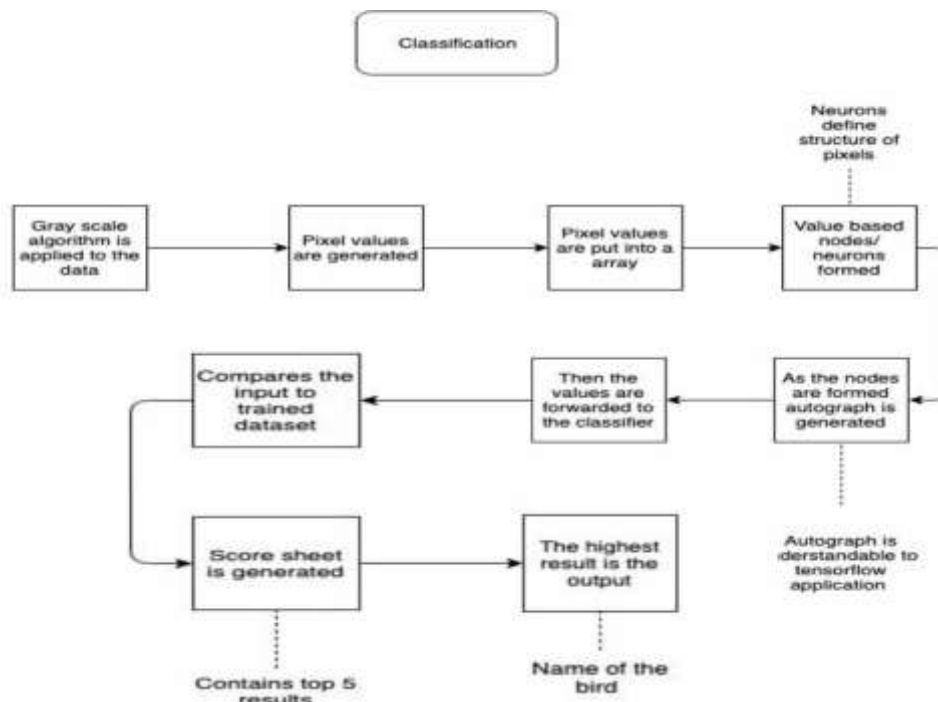

Fig-2: Classification Process

Classification:- Image classification in machine learning is commonly done in two ways:

1) Gray scale

2) Using RGB values

Normally all the data is mostly converted into gray scale. Gray scale algorithm is applied to the image formed at the fully connected layer. No of pixels are generated and value of each pixel are created. These pixel values are put into an array. The structure of the pixel defines the neurons. The value nodes / neurons are formed. These neurons relatively defined the structure of matched pixels is simply like graph of connected nodes. From the nodes formed the autograph is generated which understandable by Tensorflow to classify the image. The values get forwarded to the classifier. The values get compared with the pre-defined images of the datasets. A score sheet is formed. The score sheet is a result which contains top 5 match results. The highest matching value in the score sheet is taken as an output of the system i.e the output of the system will be the name of the bird and its information.

5. CONCLUSION

The present study investigated a technique to spot the bird species victimization. Deep learning rule (Unsupervised Learning) on the dataset (Caltech-UCSD Birds 200) for classification of image. It consists of two hundred classes or eleven, 788 photos. The generated system is connected with a easy web site wherever user can transfer picture for identification purpose and it offers the required output. The projected system works on the principle supported detection of an area and extracting CNN options from multiple convolutional layers. These options area unit aggregate so given to the classifier for classification purpose. On basis of the results that has been made, the system has provided the eightieth accuracy in prediction of finding bird species. This paper presents a outline of our project. the most purpose of the project is to spot the bird species from a picture given as input by the user. The technology used is transfer learning and MATLAB. We tend to used MATLAB as a result of it's appropriate for implementing advanced rule and provides smart numerical exactness accuracy. Its addition ally general purpose and scientific. We tend to achieved associate accuracy of 80%-85%. We tend to believe this project extends an excellent deal of scope because the purpose meets. In life analysis and observance, this idea are often enforced privately traps to keep up the record of life movement in specific home ground and behavior of any species.

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