

Bird Species Identifier using Convolutional Neural Network

- INTRODUCTION

Our living ecosystem consists of various types of species such as humans, animals, birds, etc. Our paper focuses on identifying the species of the birds. By protecting these bird species we firstly require accurate information about their species. For identification purposes we are creating a neural model where the user can upload the image that image will be processed by the neural model and providing the output to the user the species of bird. Creating our neural network model for the species identification task will require a decent amount of data i.e. images of a bird with their annotation

- PROBLEM STATEMENT

Manual identification of bird species is very tedious task as well as very unreliable as his/her knowledge may not be in-depth and limited to the local bird species. This process is a lot of time-consuming and it may contain some errors. There are lots of books that have been published for the process of helping a human incorrectly identifying bird species. The current bird species identification process involved using the bird images. Due to such a process, large scale bird identification is almost an impossible task. So, to automate the process is a more practical approach.

- MOTIVATION

we decided to develop Bird Species identifier which identify the species of the bird from an uploaded image. This system helps in removing the knowledge barrier and smooth the species identification process. As there many software which provides the information of bird but none of them provide the identification feature which we will provide.

we try to develop a fully automatic, robust deep neural learning method .

We plan to build software that will identify the species of the bird accurately as well as provide the summarised information of the identified species.

- LITERATURE SURVEY

To produce an Optimal Identifier there are numerous techniques, Bird Species Identification Based on Image Features is our option.

Recently, numerous projects are been developed to automate the bird classification process which involved use of technique such as audio data instead of images. This technique has certain advantage over image such as it doesn't require the line of sight and each species have unique calls which can be used for identification. But this technique is not reliable as a bird may not emit sound at all for longer duration and it's also does not help to count number of bird accurately. To overcome such challenges, number of research is been undergoing on techniques such as image-based techniques and computer vision. Several researchers have also proposed methods such as to use motion features of bird's curvature and wingbeat frequency. Atanbori et al have done extended research on this method.

Cheng et al purpose the system which uses discriminative features for classifying the bird species based on parts of birds that uses a support vector machine along with Normal Bayes classifier. Another researcher Marini et al proposed an approach to eliminate background elements using a color segmentation and compute normalized color histograms to extract feature vector for classification.

Fine-Grained Image Categorisation – Technique for discriminating fine-grained classes (such as animal species or plants and man-made objects) which can be divided into two main groups. The prior group of methods uses distinct visual cues from local parts which are obtained by the detection or using the segmentation method. The other group of methods focal point is on finding interclass label dependency with the help of a pre-defined hierarchical structure of labels or manually-annotated visual attributes. Performance is drastically improved with the help of convolutional neural networks (CNNs), but for the training of CNNs large dataset of images of high quality are required. Fine-grained classification of low-resolution images is a very challenging process

- PROPOSED SYSTEM

Due to the wide variation in the species appearance, it is quite difficult to non-professionals to identify the species of the bird. It is also an exhausting process to annotate all the bird images with expertise human knowledge. Therefore, there is a need to develop an automatic classifier for bird species, which will be a great convenience for many practical applications. Classifying the species of the bird is also an interesting problem in fine-grained categorization, which is also known as subcategory recognition, which is also a subfield of object recognition. The identifier in this paper proposed an end-to-end deep learning-based approach CNN, it will classify the type of the birds from its images which will be fed to the neural model using the available dataset.

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- IMPLEMENTATION

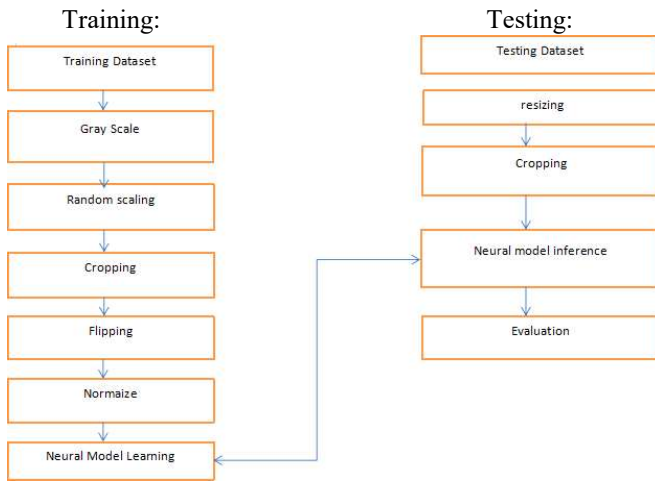


Fig [3] Training and Testing Phase

Deep learning operational working is similar to the human brain. It learns from the data and makes inferences on the data feature based on trained data. Therefore to develop a good neural model having a diverse as well as a huge dataset is necessary. For this purpose, In our project, we are using the data augmentation technique which helps to increase the number of training samples per class and reduce the effect of class imbalance. Relevant image augmentation techniques are chosen so that the neural model can learn from the diverse dataset. Those techniques are Gaussian Noise, Gaussian Blur, Flip, Contrast, Hue, Add (add some values to each channel of the pixel), multiply (multiply some values to each channel of the pixel), Sharp, Affine transform. The large dataset also help to avoid the problem of overfitting which happens quite often in deep network learning.

As the image dataset requires higher computational capability as compared to the text-based dataset. In our project, we try to reduce this computational requirement by removing the unwanted part from the image so that the neural model needs to deal with a lesser amount of pixel in the image for processing

Algorithm:

Step 1:

Users will be prompted to enter the image of the bird whose species need to be identified.

Step 2:

After the image is uploaded, the uploaded image is resized and gray scale.

Step 3:

A preprocessed image is passed to the CNN Model to detect the Bird.

Step 4:

If the Bird is detected then it will display the results to the user.

- LIMITATION

This system is capable of identifying the bird species from an image. it becomes difficult to process when more than one species of bird is present in the provided image. also there is only 6 Type of birds to classify.

- CONCLUSION

In this paper, we have proposed a method to classify the species of the bird from an image that is uploaded by the users by using technique Convolutional Neural Network.