IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 4, Issue 2, April 2021
Impact Factor: 4.819

Review Paper on "Dog Breed Classification Using Convolutional Neural Network"

Suyash S. B., Rishikesh P. P., Rohit P.W., Kaustubh P. J., Prof. Balaji. Bodke
BE, Department of Computer Engineering
Modern Education Society, College of Engineering, Pune, India

Abstract: *Dogs are one of the most common domestic animals. Due to a large number of dogs, there are several issues such as population control, decreased outbreak such as Rabies, vaccination control, and legal ownership. At present, there are over 180 dog breeds. Each dog breed has specific characteristics and health conditions. In order to provide appropriate treatments and training, it is essential to identify individuals and their breeds. Machine learning gives the strength on the thanks to train algorithms model which will handle the difficulties of information classification also prediction grounded on totally on arising information as of raw information. Convolutional Neural Networks (CNNs) gives single often used methods for image classification and detection. In this exertion , we define a CNN based approach for spotting dogs in perchance complex images and due to this fact reflect inconsideration on the identification of the one of kinds of dog breed. The experimental outcome analysis supported the standard metrics and thus the graphical representation confirms that the algorithm (CNN) gives good analysis accuracy for all the tested datasets.*

Keywords: CNN, Machine Learning, Classification

I. INTRODUCTION

Machine learning may be a subfield of AI (AI). The goal of machine learning generally is to know the structure of knowledge and fit that data into models which will be understood and utilized by people. Although machine learning may be a field within computing, it differs from traditional computational approaches. In traditional computing, algorithms are sets of explicitly programmed instructions employed by computers to calculate or problem solve. Machine learning algorithms instead leave computers to coach on data inputs and use statistical analysis so as to output values that fall within a selected range. Because of this, machine learning facilitates computers in building models from sample data so as to automate decision-making processes supported data inputs. Most of the dog breeds are developed in order to drive some specific things. Knowing the breed of dog can help us to predict and understand the behavior. And this is essential when it comes to managing and training dogs for specific tasks. In machine learning, convolutional Neural Network (CNN) is complicated feed forward neural networks. CNNs are used for image classification and recognition due to its excessive accuracy. The CNN follows a hierarchical model which struggles on constructing a network, sort of a funnel, and eventually offers out a definitely related layer the place all the neurons are linked to each and every different and consequently the output is processed A computer learns to classify images, text and sound. The pc is trained with large image datasets then it changes the pixel value of the image to an indoor representation, where the classifier can detect patterns on the input image. We proposed a model that uses CNN network to classify Images between Human and Dogs. In the Proposed model we are using a model VGG16 Net to find the predicted output for a given image.

II. LITERATURE SURVEY

This paper presents a solution for identifying dog breeds using their images of their faces. The proposed method applies a deep learning based approach in order to recognize their breeds. [1] This paper addresses the problem of biometric identification of animals, specifically dogs. They apply advanced machine learning models such as deep

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 4, Issue 2, April 2021
Impact Factor: 4.819

neural networks on the photographs of pets in order to determine the pet identity. In this paper, we explore the possibility of using different types of "soft" biometrics, such as breed, height, or gender, in fusion with "hard" biometrics such as photographs of the pet's face [2]

In this exertion, we define a CNN based approach for spotting dogs in perchance complex images and due to this fact reflect inconsideration on the identification of the one of kinds of dog breed. The experimental outcome analysis supported the standard metrics and thus the graphical representation confirms that the algorithm (CNN) gives good analysis accuracy for all the tested datasets.. [3]

In this paper, we implement an android application that identifies the breed of a dog via image analysis, using a Convolutional Neural Network (CNN) and transfer learning model. The android application lets the user click or upload a picture of a dog. It then pre-processes the image and extracts the features required for testing. Prediction of dog breed is done using CNN and transfer learning. [4]

In this paper ADA boosting methodology is used for breed analysis and recognition. ADA Boosting creates a strong classifier from several weak classifiers. To separate the dog breeds from one another, we use Image processing classification. It predicts the predominant breed/s present in the canine with maximum accuracy. [5]

This project uses computer vision and machine learning techniques to predict dog breeds from images. First, we identify dog facial key points for each image using a convolutional neural network. These key points are then used to extract features via SIFT descriptors and color histograms. We then compare a variety of classification algorithms, which use these features to predict the breed of the dog shown in the image [6]

The paper presents the classification methods for dog breed classification using image processing approaches conventional based approaches by Local Binary Pattern (LBP) and Histogram of Oriented Gradient (HOG). [7] In this project we are using various pre-trained models like VGG16, Xception, InceptionV3 to train over 1400 images covering 120 breeds out of which 16 breeds of dogs were used as classes for training and obtain bottleneck features from these pre-trained models. [8]

The current paper presents a fine-grained image recognition problem, one of multi-class classification, namely determining the breed of a dog in a given image. The presented system employs innovative methods in deep learning, including convolutional neural networks. Two different networks are trained and evaluated on the Stanford Dogs dataset. The usage/evaluation of convolutional neural networks is presented through a software system. [9]

This paper considers application of machine learning in the context of animal identity management veterinary practice. In this application, electronic medical records of animal s would include digital photo graphs that are used to identify them using image processing and recognition technologies.

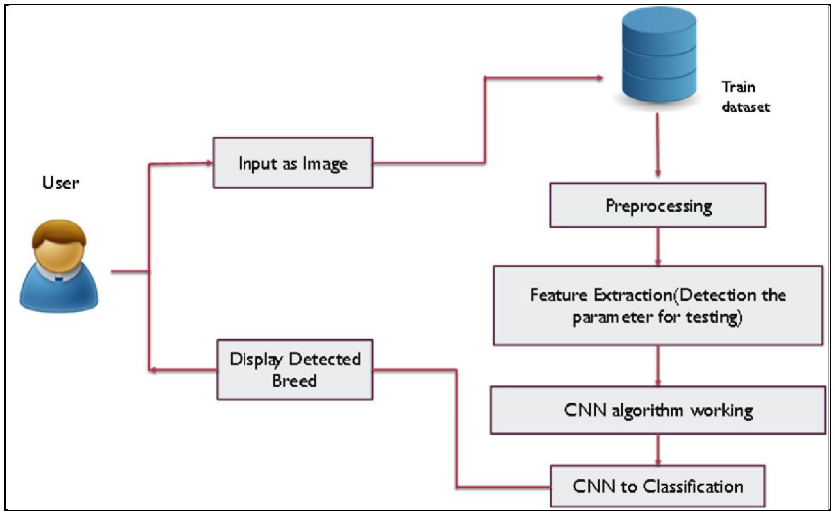
We investigated how combination of the " soft" biometrics such as breed, a s well as face biometrics of dogs can improve identification of dogs. We aplly transfer learning on GoogLeNet to perform the breed classification on the proposed BreedNet, and then to identify individual dogs within the classified breeds, on the proposed DogNet.[10] These were overall paper ideologies we went through and they would help us to make our system to work in a great manner.

III. Proposed System

In this paper we propose a system that helps identify and classify the various dog breeds across the world. Our system uses a pretrained VGG-16 model and further trained Convolutional Neural Networks to be more precise. In the initial pre-processing, the raw data is collected and is prepared for the primary processing analysis line and extracting required data from a large set of data.

Later the filtered data is passed to feature extraction, in this the features of data like eye, face structure, mouth, hair are extracted. Further we have created 3 convolution layers with relu activation function for extraction of features from image. Lastly, we have trained and validated the model. This model will predict the dog breed and gives the output for the dog breed.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 4, Issue 2, April 2021
Impact Factor: 4.819



IV. CONCLUSION

In this system Convolutional neural network is a learning method for data analysis and predictions, now days it also become very popular for image classification problems. Dog breed prediction of deep learning developed using convolutional neural network is to predict the breed of hundred images in taking their images as input. Usage transfer learning on the way to build model that make output and around to hundreds of dissimilar dog types. The results were pretty good for the images the model was shown. The algorithm was able to identify dog breeds quite exactly. Transfer learning takes an excessive choice in the upcoming in joining a pre-built model by the model we created.

REFERENCES

[1]. Knowing Your Dog Breed: Identifying a Dog Breed with Deep Learning International Journal of Automation and Computing 18(1), February 2021, 45-54

[2]. Dog Identification using Soft Biometrics and Neural Networks Natural Sciences and Engineering Research Council of Canada 22 July 2020

[3]. Dog Breed Prediction using Convolutional Neural Network International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-9 Issue-5, June 2020

[4]. Breakthrough Conventional Based Approach for Dog Breed Classification Using CNN with Transfer 2019 11th Learning Information Conference on Information Technology and Electrical Engineering(ICITEE),Pattaya, Thailand

[5]. Dog Breed Classifier Using Deep Learning Jaypee University of Information Technology Waknaghat, Solan-173234, Himachal Pradesh July 2019

[6]. Dog Breed Identification with Fine tuning of Pre-trained models International Journal of Recent Technology and Engineering (IJRTE) ISSN: 2277-3878, Volume-8, Issue-2S11, September 2019

[7]. Recognition of Dog Breeds using Convolutional Neural Network and Visual Geometry Group International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-9 Issue-1, October 2019

[8]. Dog Breed Identification Using Convolutional Neural Networks on Android CVR Journal of Science and Technology, Volume 17, December 2019

[9]. Using Convolutional Neural Networks to Classify Dog Breeds Hsu, David Stanford University 2018

[10]. Transfer Learning on Convolutional Neural Networks for Dog Identification XinyuanTu , Kenneth Lai , Svetlana Yanushkevich 2018 IEEE

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 4, Issue 2, April 2021
Impact Factor: 4.819

[11]. Dog Breed Identification Using Convolution Neural Network and Web Scraping International Journal of Science and Research (IJSR) ISSN: 2319-7064 ResearchGate Impact Factor (2018)

[12]. Dog Breed Identification Using Deep Learning Zalan Raduly, Csaba Sulyok Babes, Zsolt Vadaszi ResearchGate 2018

[13]. Dog Breed Identification School of Computer Science University of Waterloo Waterloo 2017