ANIMAL SPECIES RECOGNITION SYSTEM USING DEEP LEARNING

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Abstract - Animal watching is a common sport, but you must use an animal book to identify the species. We established a deep learning platform to help users in recognising endemic animal species, as well as an app called Imagenet of Animals to provide animal lovers with a handy tool for appreciating the beauty of animals (IoA). To recognise essential traits in animal pictures, a convolutional neural network (CNN) was trained. We initially designed and generated a restricted zone The shapes and colours of the levels of granularity are intriguing. before balancing the distribution of Animal species. To improve feature extraction, the outputs of the previous and subsequent layers were linearly merged using the skip connection technique.

Key Words: Convolution neural network (CNN), Tensorflow (TF), Rectified linear unit (ReLU), Fully connected (FC), Imagenet, Central Processing Unit (CPU), Graphical Processing Unit (GPU), GoogleNet Inception V4 network

1. INTRODUCTION

In recent decades, pattern classification has become among the most essential areas of artificial intelligence, playing a crucial role in a variety of real-world applications.

Contrary to the natural intelligence exhibited by people and other animals, artificial intelligence (AI), sometimes referred to as machine intelligence, is intelligence expressed by machines. The phrase "intelligent agent" refers to any machine that can perceive Adapt to its environment and take efforts to maximise the chance of success in achieving its goals. The term "artificial intelligence" is used when a machine duplicates "cognitive" activities such as "learning" and "problem solving," which are frequently associated with other human brains.

The Animals Recognizer utilises images as input to learn and recognise the animals, however deep learning normally need a heavy amount of training dataset, and the training process is time-consuming and slow. As a consequence, the GoogLeNet inception v4 network is utilised to extract the Animal features. The animals are then categorised using the attributes that were gathered by assessing how closely they resemble the template. Studies show that our system can accurately identify a specific animal's species after learning around 10 samples of that animal. The deep learning incremental framework gives the self-learning system a wide range of application and customization.

Artificial intelligence (AI) is the study of the way the human brain makes decisions, learns, and thinks. The study also results in clever software systems. The objective of AI is to improve computer abilities that are comparable to those of the human brain, such as reasoning, learning, and problem-solving.

1.1 Aim and Objective

The project's goal is to identify different animal species using deep CNN. Because there are so many different kinds of animals, manually recognising them may be difficult. Data mining limits are studied in this part of the research, and an unique technique termed Lightweight Machine Convolution Network for Animal Recognition is devised. It will have low computational expenses and great precision.

1.2 Proposed System

The proposed approach employs the ImageNet Inception v4 network and CNN to identify animal traits, as well as TensorFlow to allow our recognizer to recognise any species.

2. LITERATURE SURVEY

Yao, S. et al. [1] introduced fine grained visual categorisation, which tries to distinguish between objects of the same kind. With just the original image as its input, this novel description was able to automatically provide visual depictions that are distinct enough for precise visual categorization. Fine-grained visual categorization has a number of drawbacks, but its fundamental drawback is that it is computationally expensive and unsuited for large-scale picture classification. Xie. Et al. [2] proposes that instance search should not produce only nearly identical photos while also providing fine-grained results, which is typically what a user wants. It creates a large-scale database with the reference pictures compressed at consistent bit rate levels using JPEG encoders using various optimization techniques, introducing a baseline system employing fine-grained classification scores. In subjective tests, the comparison approach is used to rank them in order to identify tiny differences. The primary problem with fine-grained findings is that classification of items that belong to the same species duplicates the data. The following paper discusses the template matching [3] algorithm, which is used to pinpoint certain details in a picture that should match the template image. Information regarding the locations of the image's interesting items is given, along with a list of those things.

5. RESULTS AND DISCUSSON

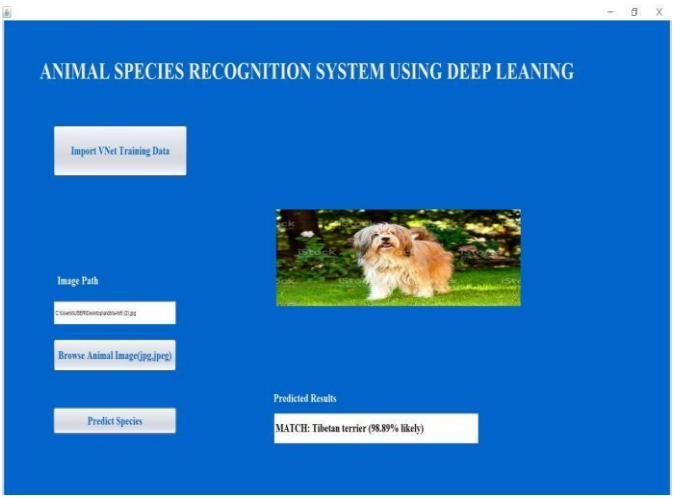

Fig-4 Output Generated for Land Animal

First the datasets are imported by clicking "Import VNet Training Data" and image is browsed using "Browse Animal Image" button and the path of the image is displayed in the "Image Path" box. Fig-4 shows the result when a land animal is uploaded. This represents the output generated "MATCH: Tibetan terrier (98.89% likely)" for the land animal along with accuracy percentage after the "Predict Species" button is pressed.

Fig-5 Result for an aquatic animal

Fig-5 represents the output generated "MATCH: puffer (92.38% likely)" for the aquatic animal along with accuracy percentage after the "Predict Species" button is pressed.

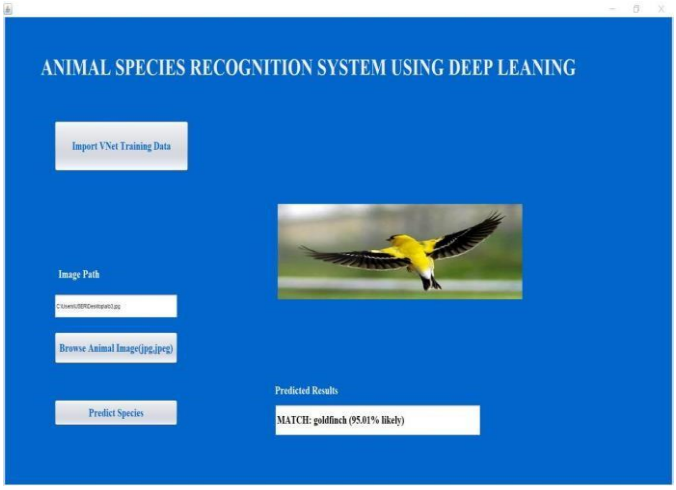

Fig-6 Output generated for Bird

Fig-6 represents the output generated "MATCH: goldfinch (95.01% likely)" for the bird along with accuracy percentage after the "Predict Species" button is pressed.

6. CONCLUSIONS

With the remarkable potential of neural network, the proposed system can recognize animals of all species this includes land animals, aquatic animals and birds. Training datasets obtained from GoogleNet inception model will be in terms of graph values so the graph values for the input image is obtained by using the algorithm specified. Animal species recognition system is implemented with the help of CNN, Google Net inception v4 helps to achieve a higher learning rate and results in faster overall performance.

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