**LITERATURE SURVEY**

**1) Speedy Image Crowd Counting by Light Weight Convolutional Neural Network**

**AUTHORS:**  Vivekanandam, B.

In image/video analysis, crowds are actively researched, and their numbers are counted. In the last two decades, many crowd counting algorithms have been developed for a wide range of applications in crisis management systems, large-scale events, workplace safety, and other areas. The precision of neural network research for estimating points is outstanding in computer vision domain. However, the degree of uncertainty in the estimate is rarely indicated. Point estimate is beneficial for measuring uncertainty since it can improve the quality of decisions and predictions. The proposed framework integrates Light weight CNN (LW-CNN) for implementing crowd computing in any public place for delivering higher accuracy in counting. Further, the proposed framework has been trained through various scene analysis such as the full and partial vision of heads in counting. Based on the various scaling sets in the proposed neural network framework, it can easily categorize the partial vision of heads count and it is being counted accurately than other pre-trained neural network models. The proposed framework provides higher accuracy in estimating the headcounts in public places during COVID-19 by consuming less amount of time.

**2) Study of Variants of Extreme Learning Machine (ELM) Brands and its Performance Measure on Classification Algorithm**

**AUTHORS:** Manoharan, J. Samuel

Recently, the feed-forward neural network is functioning with slow computation time and increased gain. The weight vector and biases in the neural network can be tuned based on performing intelligent assignment for simple generalized operation. This drawback of FFNN is solved by using various ELM algorithms based on the applications issues. ELM algorithms have redesigned the existing neural networks with network components such as hidden nodes, weights, and biases. The selection of hidden nodes is randomly determined and leverages good accuracy than conservative methods. The main aim of this research article is to explain variants of ELM advances for different applications. This procedure can be improved and optimized by using the neural network with novel feed-forward algorithm. The nodes will mainly perform due to the above factors, which are tuning for inverse operation. The ELM essence should be incorporated to reach a faster learning speed and less computation time with minimum human intervention. This research article consists of the real essence of ELM and a briefly explained algorithm for classification purpose. This research article provides clear information on the variants of ELM for different classification tasks. Finally, this research article has discussed the future extension of ELM for several applications based on the function approximation.

**3) Automated Bird Species Identification using Audio**

**AUTHORS:** Chandu B, A. M

In this paper, an automatic bird species recognition system has been developed and methods for their identification has been investigated. Automatic identification of bird sounds without physical intervention has been a formidable and onerous endeavor for significant research on the taxonomy and various other sub fields of ornithology. In this paper, a two-stage identification process is employed. The first stage involved construction of an ideal dataset which incorporated all the sound recordings of different bird species. Subsequently, the sound clips were subjected to various sound pre-processing techniques like pre-emphasis, framing, silence removal and reconstruction. Spectrograms were generated for each reconstructed sound clip. The second stage involved deploying a neural network to which the spectrograms were provided as input. Based on the input features, the Convolutional Neural Network (CNN) classifies the sound clip and recognizes the bird species. A Real time implementation model was also designed and executed for the above described system.

**4) Bird Sound Identification based on Artificial Neural Network**

**AUTHORS:** M. M. M. Sukri, U. Fadlilah, S. Saon, A. K. Mahamad, M. M.

Som and A. Sidek

Due to effect of climate changes and count of endangered animal, many researchers proposed animal species recognition system to help them for specific study. This paper proposes to identify bird sound identification using Artificial Neural Network (ANN). Each bird has a different tone of sounds. ANN is applied to classify and recognise the bird sounds using Matlab software. Firstly, all required data in term of power spectral density of bird is used in order to obtain data for each bird types. The next process is to train ANN to identify species of birds. Only one bird can identify in one time. Lastly, the graphical user interface (GUI) of bird sound identification have been developed that required the user to fed audio input of bird sound in order to recognise bird species. This project is done successfully and can be used to identify bird species.

**5) Deep Learning Based Audio Classifier for Bird Species**

**AUTHORS:** Aarti Madhavi, R. P.

The effect of human activities on the environment has reached a point where it has become necessary to track the effects before it causes irreparable damage to the environment. One of the ways to track such effects is to monitor the breeding behaviour, biodiversity and population dynamics of animals. Birds are one of the best species to track as they do tend to be the most reactive ones for any change in the environment e.g., deforestation or forest fires. Till now, the tracking of the birds was done manually by experts, which is very tedious at the same time consuming and non-viable method. As a result to alleviate this issue and provide assistance to the ecologists we proposing a machine learning method to recognize the bird's species based on the audio recordings. To achieve this goal, we intend to use the state of art convolutional neural network architecture called the deep residual neural networks as compared to the traditionally used classifiers like SMACPY, SVM and other relatively less sophisticated methods. We leverage methods like data augmentation and the existing carefully crafted datasets from Neural Information Processing Scaled for Bioacoustics to showcase the effectiveness of our method.