**LITERATURE SURVEY**

**Digital Naturalist - AI Enabled tool for Biodiversity Researchers**

**PAPER TITLE:** Automatic classification of grouper species by their sounds using deep neural networks.

**YEAR OF PUBLICATION:** 2018.

**AUTHORS:** Ali K. Ibrahima and Hanqi Zhuang, Laurent M. Cherubin , Michelle T. Sch€arer-Umpierre, Nurgun Erdol.

**METHODOLOGY:**

This research examines the value of deep learning for automatically classifying grouper species based on their vocalisations. The proposed method uses wavelet denoising to reduce background ocean noise and deep neural networks to categorise the noises made by different species of groupers. The recommended method outperforms a previously described method for the automatic classification of grouper sounds, according to experimental data for four species of groupers, achieving a classification accuracy of 90% or higher in every scenario examined.

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**PAPER TITLE:** Classifying Fish by Species Using Convolutional Neural Networks.

**YEAR OF PUBLICATION:** 2021.

**AUTHORS:** Abdullah Albattal, Anjali Narayanan.

**METHODOLOGY:**

The input photos have been scaled to the same dimensions. In the displayed models, convolutional layers produce either 32 or 64 feature maps, which highlight the significant image features that the convolutional layer detected. They developed a CNN that can be used to recognise fish for research and fisheries purposes, and it can be applied to datasets collected by research organisations such as the Nature Conservancy. Machine learning techniques make it possible to automate image processing, and they can also be adapted to accurately identify and separate fish species. Using a convolutional neural network-based technique, the Mask-RCNN with a Res-Net (152) as the basis for feature extraction, they identify, isolate, and generate masks for 99.6% of the photographs in the dataset.

**PAPER TITLE:** Research on image classification model based on deep convolution neural network.

**YEAR OF PUBLICATION:** 2019.

**AUTHORS:** Mingyuan Xin and Yong Wang.

**METHODOLOGY:**

On the basis of their investigation of the error backpropagation approach, they proposed a ground-breaking training criterion for depth neural networks with maximum interval minimal classification error. In order to obtain more accurate results, the cross entropy and M3 CE are analysed together. Finally, they tested our suggested M3 CE-CEc using two deep learning benchmark databases, MNIST and CIFAR-10. Experimental results indicate that M3 CE can boost cross-entropy and is a valuable addition to the cross-entropy criterion. M3CE-CEc has accomplished success in both datasets. They proposed changing the convolutional neural network (CNN) architecture in order to enhance omnidirectional image identification using standard 2D significant prediction (ODI).

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**PAPER TITLE:** Digital Naturalist Using Deep Learning.

**YEAR OF PUBLICATION:** 2021.

**AUTHORS:** Aparna, Saloni M P, Chandana M, Neha U K, Banushree D J, Prof. Naresh Patel K M.

**METHODOLOGY:**

It seeks not only to identify flora and animals, but also to learn about their habits, habitats, living conditions, and grouping in order to obtain protective services. It uses a web application to forecast photos using CNN and segmentation from a supplied dataset (process of partitioning a digital image into multiple segments). They utilised image processing algorithms to detect image classes with greater precision. They categorised birds based on colour characteristics using the CNN approach. It provides superior and sturdy outcomes for various photographs.

**PAPER TITLE:** Bird Classification using Deep Learning.

**YEAR OF PUBLICATION:** 2020.

**AUTHORS:** Piyush Bidwai, Vaibhav Mahalle, Eshan Gandhi, Sharda Dhavale.

**METHODOLOGY:**

Convolutional neural networks (CNN) are a deep learning approach for classifying images (Tenser Flow, Pytorch Models). The Python programming language, the Pytorch model, and a Raspberry Pi are utilised to classify birds. The input image is captured by an electrical device and then converted to greyscale. Using deep learning techniques, several neurons were discovered. The more neural networks an image traverses, the more information these algorithms gain about it. There are a number of hidden layers in addition to the input layer, output layer, and others. Each layer consists of a group of neurons, and every neuron in one layer is connected to every neuron in the layer underneath it. Parts one and two of CNN are feature extraction and classification, respectively. Image categorization: There are commonly two picture categorization algorithms used in machine learning. 2. Grayscale Employing RGB values.

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**PAPER TITLE:** Bird Species Identifier using Convolutional Neural Network.

**YEAR OF PUBLICATION:** 2021.

**AUTHORS:** Kamlesh Borana, Umesh More, Rajdeep Sodha, Prof. Vaishali Shirsath.

**METHODOLOGY:**

Convolutional Neural Networks (CNN) and image processing are used to identify birds from images, and transfer learning is used to train our neural model. For the species identification challenge, they are developing their own neural network model, which will need a larger amount of data, such as photographs of birds with their annotations, as well as a tremendous amount of computational power. However, they employ a pre-trained model and carry out transfer learning on our dataset in order to increase accuracy. A key development in the fields of deep learning and machine learning is transfer learning. It fixes the issue with not enough training data. If the domains of the source and user models are comparable, transfer learning makes it easier to transfer knowledge from the source neural model to the user's model.

Transfer learning can take many different forms, including instances-based transfer, mapping-based transfer, network-based transfer, and adversarial-based transfer.