LITERATURE REVIEW

Team ID	**PNT2022TMID52124**
Student Name	**HASMATH SAHINA A K** **HEMA PREETHI M** **JAYAKODI J** **JAYANTHI S**
Project Name	**Digital Naturalist-AI Enabled tool for Biodiversity Researchers**

S.No	Title	Author	Year	Inference
1	**'Bird classification using CNN'**	Simon Haykin	1994	❖ This work presents a scenario with classification of birds using CNN technique based on color features. They used color images of birds with almost similar types. ❖ Image segmentation is carried in various stages. At first, the pixels are arranged and segmented on the basis of edges and spatial where clustering is done. ❖ Next, the blocks are segmented using edge detection. The computational efficiency increases for image and training becomes easier. ❖ This approach provides with better and robust results for different images. Here they took sparrow for the case study and evaluated the features of it using the steps up listed. ❖ Their experimental results classify the effectiveness of proposed approach to improve the segmentation quality in aspects of precision and computational time.

2	**'Classification and Grading of Image Using Texture Based Block-Wise Local Binary Patterns'**	Paul Viola, Michael Jones	2001	❖ Paul Viola, Michael Jones et al., used global textural feature viz., Local Binary Pattern for feature extraction. ❖ Initially, an image is divided into k number of blocks. Subsequently,the texture feature is extracted from each k blocks of the image. The k value is varied and has been fixed empirically. ❖ In their approach experimentation purpose, the bird dataset is created using 4 different classes and experimentation is done for whole image and also with different blocks like 2, 4 and 8. ❖ Grading of Bird is done using Support Vector Machine classifier.Finally, the performance of the grading system is evaluated through metrics like accuracy,precision, recall and F-measure computed from the confusion matrix. ❖ Their experimental results show that most promising result is obtained for 8 blocks of the image.
3	**'Texture Classification from Random Features'**	Gary Bradski and Adrian Kaehler	2008	❖ In this research they presented an approach for texture classification based on random projection, suitable for large texture database applications. ❖ A small set of random features are extracted from local image

				patches and those features are embedded into a bag-of-words model to perform texture classification.
4	**'Adapted approach for Species Classification'**	Schmid HuberJ.	2015	❖ In this work, an adaptive approach for the identification of species is proposed and experimentally validated. Image processing technique is followed. ❖ In the first step K-Means ❖ clustering is used for image segmentation, in the second step some state of art features is extracted from segmented image, and finally images are classified under one of the classes by using multi-class support vector machine. ❖ The classification accuracy is achieved up to 89%.
5	**'Detection And Classification of images using Detection Line'**	Haibing Wu and Xiaodong Gu	2015	❖ In this study, they present an application of neural networks and image processing techniques for detecting and classifying images. ❖ Images were segmented by a detection line (DL) method. ❖ Six geometric features (i.e., the principal axis length, the secondary axis length, axis number, area, perimeter and compactness of the image), 3 color features (i.e., the mean gray level of image on the R, G, and B bands. The methodology presented herein effectively works for classifying image to an accuracy of 90.9%.
6	**Ungulate Detection and Species Classification from Camera Trap Images Using RetinaNet and Faster R-CNN**	Gholamreza Anbarjafari, Ilja Pavlovs, Kadir Aktas ,Egils Avots, Jevgenijs Filipovs, Agris Brauns,Gundega Done, Dainis	2022	❖ This paper presents a new dataset of wild ungulates which was collected in Latvia. It demonstrate two methods, which use RetinaNet and Faster R-CNN as backbones respectively, to detect the animals in the images. ❖ Faster R-CNN–ResNet50 network and RetinaNet were trained for 34,850 iterations (10 epochs) on the training

		Jakovels, Gholamreza Anbarjafari		dataset with a batch size of 4, learning rate of 0.0001 and Adam optimizer for the weight update. The general structure of the detector involves image embedding, object localization and classification. ❖ DNN consisting of convolutional layers which are used for the feature extraction from the input image. Usually, backbone networks which are pretrained on a natural image dataset such as ImageNet are used ❖ Common networks used as the backbone are ResNet50, VGG160, Inception-ResNetV2 and DarkNet-19 ❖ The neck network takes and processes inputs from the different layers of the backbone, harnessing advantages of data pattern distribution over different feature map scalesby using FPN (Feature Pyramid Network). ❖ A feed-forward neural network which performs the classification or regression task.
7	**Convolutional Network based Animal Recognition using YOLO and Darknet**	B.Karthikeya Reddy, Shahana Bano, g.Greeshmanth Reddy,Rakesh Kommineni, p.Yaswanth Reddy	2021	❖ This research work has developed a YOLOV3 model to identify the animal present in the image given by user. The algorithm used in YOLOV3 model is darknet, which has a pretrained dataset. ❖ Machine learning has been applied to image processing. The image of animal will be given as input, then it will display the name of the animal as output by using YOLOV3 model. The detection is done by using a pretrained coco dataset from darkent ❖ The image is broken into variouslengths and widths based on the given input image. Here for the recognition of image, YOLOV3 model is using recognizer deep learning package ❖ The overall performance of the model is based on the different training images and testing images of the dataset. The detection is done by using a pre-trained coco dataset from darknet.
8	**Recognition of Endemic Bird Species Using**	Yo-Ping Huang, Haobijam	2021	❖ The objective of the paper is identifying the bird species from images. This study developed a transfer learning-based

	Deep Learning Models	Basanta		method using Inception-ResNet-v2 to detect and classify bird species. ❖ To validate the reliability ofthe model, it adopted a technique that involves swapping misclassified data between training and validation datasets ❖ The swapped data are retrained until the most suitable result is obtained. Additionally, fivefold cross-validation was performed to verify the predictive performance of the model. ❖ The proposed model was tested using 760 images of birds belonging to 29 species that are endemic to Taiwan. The model has achieved an accuracy of 98.39% in the classification of 29 endemic bird species ❖ The model achieved a precision, recall, and F1-score of 98.49%, 97.50%, and 97.90%, respectively, in classifying bird species endemic to Taiwan.