Literature Survey

Project Title : DIGITAL NATURALIST

- AI Enabled tool for Biodiversity Researchers

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1.	**Paper title**	"Automatic Bird-Species Recognition using the Deep Learning and Web Data Mining".Kang, Min-Seok, and Kwang-Seok Hong. In 2018 International Conference on Information and Communication Technology Convergence (ICTC),pp. 1258-1260. IEEE, 2018.
	Problem definition	• First, if you enter the name of the targeted bird breed, the image will be collectedfrom the Web using the image crawl. • To refine the collected images into the training dataset, the corrupted image is corrected and deleted, the outlier is removed, and finally the image is expanded to obtain the refined training data.
	Methodology/ Algorithm	• Deep Neural Network (DNN) • Convolutional Neural Network (CNN) • Tensorflow Framework • Back Propagation
	Advantages	• It is used in various applications like the image recognition, video analysis,natural language processing, and drug discovery • The performances are improving annually.
	Disadvantages	• Birdwatching is a common hobby but to identify their species requires theassistance of bird books.

2.	**Paper title**	"Rare Animal Image Recognition Based on Convolutional Neural Networks" .Hao, Xinyu, Guangsong Yang, Qiubo Ye, and Donghai Lin. In 2019 12th International Congress on Image and Signal Processing, BioMedical Engineering and Informatics (CISP-BMEI), pp. 1-5. IEEE, 2019.
	Problem definition	• Rare animal image recognition based on the basic model of CNNs, by which to autonomously extract the image features in the training set • Construct an image recognition system to identify rare animals
	Methodology/ Algorithm	• Convolutional neural networks(CNN) • Matrix Multiple CNN (MMCNN) • Deep learning Convolutional neural network
	Advantages	• Compared with ordinary neural networks, the advantages of simple operation and small computational complexity are very beneficial for the application Compared with ordinary neural networks • the advantages of simple operation and small computational complexity are very beneficial for the application and promotion of many industries. • The subsequent work of this research is to improve the network structure to improve the recognition accuracy while reducing the computational complexity.
	Disadvantages	• The subsequent work of this research is to improve the network structure toimprove the recognition accuracy while reducing the computational complexity**.**

3.	**Paper title**	"Image Classification Using Deep Neural Network". Tiwari, Vaibhav, Chandrasen Pandey, Ankita Dwivedi, and Vrinda Yadav.In 2020 2nd International Conference on Advances in Computing, Communication Control and Networking (ICACCCN), pp. 730-733. IEEE, 2020.
	Problem definition	• Image Classification is widely used in various fields such as Plant leaf disease classification, facial expression classification. • To make bulky images handy, image classification is done using the concept of a deep neural network.
	Methodology/ Algorithm	• Deep Neural Network • VGG , • Image Classification • Convolutional Neural Network (CNN)
	Advantages	• An initial interesting point is that the common design principles of the VGG models since it performed best in the competition called ILSVRC 2014[10] • It is very simple and easy to comprehend and implement this modularconstruction of the architecture.
	Disadvantages	• It is extremely expensive to train due to complex data models. • Moreover deep learning requires expensive GPUs and hundreds of machines.This increases cost to the users.

4.	**Paper title**	"Detection and classification of opened and closed flowers in grape inflorescences using Mask R-CNN". Pahalawatta, Kapila, Jaco Fourie, Amber Parker, Peter Carey, and Armin Werner. In 2020 35th International Conference on Image and Vision Computing New Zealand (IVCNZ), pp. 1-6. IEEE, 2020.
	Problem definition	• This is because it involves the processing of images with varying image qualities, and also because of the close similarity in images between the two classes of interests, opened and closed flowers. • Our aim is to build a system with one of the most promising deep learning object detection networks, Mask R-CNN, to detect the individual instances of the above two classes separately using the images with no prior alterations
	Methodology/ Algorithm	• R- Convolutional Neural Network (R-CNN) • Convolutional Neural Network (CNN)
	Advantages	• The similarity of instance shapes between the two classes, opened and closed flowers, and also the similarity of pixel texture between opened and closed flowersmakes the purely image processing based instance segmentation a challenging task.
	Disadvantages	• Model accuracy was tested by letting the model extract and segment flowerinstances from images that were not in the training set.

5.	**Paper title**	"Convolutional Network based Animal Recognition using YOLO andDarknet".Reddy, B. Karthikeya, Shahana Bano, G. Greeshmanth Reddy, Rakesh Kommineni, and P. Yaswanth Reddy. In 2021 6th International Conference on Inventive Computation Technologies (ICICT), pp. 1198-1203. IEEE, 2021.
	Problem definition	• The main goal of this research work to build animal an recognition methodologyusing YOLOV3 model. • The image of animal will be given as input, then it will display the name of theanimal as output by using YOLOV3 model. • The detectionis done by using a pre-trained coco dataset from darknet.
	Methodology/ Algorithm	• YOLO V3 • Darknet • Convolutional network • Detector • Opencv
	Advantages	The image which are predicted correct type of animal name
	Disadvantages	• Wrong output means the images which are predicted a different name rather thanthe correct name of the given input image. • No output means it is not able to predict the given input images.