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Application for Nursery with Flower Recognition System: A Survey

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ABSTRACT:-

Flowers are among God's most exquisite creations, and there are millions of different species and shades of them.

It takes a botanist with extensive knowledge and abilities to identify each of them. By applying artificial intelligence to real-world issues, the majority of the impossibilities in this rapidly evolving technological era are made possible. For nurseries, the use of machine learning methods like convolutional neural networks for flower species identification using only an image would be very beneficial. With merely an image of the target flower as input, convolutional neural networks are attempted to be introduced in this paper to accurately identify flowers. In this method, all that is required to forecast is to take an image with your mobile device, upload it, and then click the Predict button.

Keywords:- Flower Recognition, Web Application,Convolutional Neural Network, Deep Learning.

INTRODUCTION

Frequently, when we see a flower, we becomeinterested in learning more about it. However, itwould be extremely difficult for the average person with little knowledge of flower species to correctly identify them. The fact that they come in such a widerange of color and shape variations renders it impossible. To learn more about a flower, you only need to browse the internet. What if, however, the connection between the flower's picture and the theme is broken? Here comes the need of usingmachine learning methods to support such nature lovers.
The most alluring and distinctive aspect of a plant is its flower. Recognizing flowers can thereforeaid in learning more about the plant. The color and shape of flowers are their two most distinguishing characteristics.
These characteristics can be used to train the model so that it can subsequently recognize an unidentified bloom. The majority of the techniques in use today produce ineffective outcomes, like giving the probabilities of a select few anticipated blooms. Therefore, our goal is to make it simple andaccurate for regular people to recognize a flower theyhave seen. With the use of convolutional neuralnetworks, we create an effective model for the classification of floral images in the suggested system. The model will be trained using thepreviously gathered pictures of various flowers and their related labels. Once trained, the model uses an image of a flower as input and forecasts with information about the nursery where it is sold, the information on the plant is also displayed.

LITERATURE SURVEY(ABSTRACT)

In this publication, systems for classification and recognition are used to make the best use of the already-existing data by extracting features from it and displaying them. With the help of text recognition, they want to classify flowers in this research. In reality, flowers' dimensions are taken into account, and the flower is listed in the dataset along with its measurements. The purpose of this essay is to highlight the characteristics of flowers as well as their benefits and drawbacks. They chose KNN and Random Forest as the two algorithms with the highest accuracy based on their performance.

To categorize various flowers, they have created a deep learning network. For this, they used the Visual Geometry Group's 102-category flower data set from Oxford University, which has 8189 photos in 102 categories. For the goal of classification in their method, they have used a convolutional neural network architecture. The Training Accuracy and Testing Accuracy of the architecture have been discovered by maintaining all hyper-parameters. When compared to the 0.98% accuracy of random classification, these results are incredibly strong. This method for classifying flowers can be employed in real-time applications, which can assist both campers and botanists in their study.

One method for streamlining procedures like robotic process automation and digital asset management is computer vision. In terms of its capabilities and what it can offer and do for various businesses, it has come a long way. Object detection and picture detection are two uses for computer vision. Despite being relatively new, this field of technology still has a lot of obstacles to overcome. The paucity of thoroughly annotated photos to utilize for training the best algorithms and the lack of accuracy for application to real-world images that differ from the training dataset are challenges in this subject. This article aims to update the pre-trained machine learning models ResNet50 and VGG19, respectively, to address these difficulties.

In this paper, approaches for identifying flower species using transfer learning based on CNN are investigated. For the classification of floral species, popular pretrained learning approaches like VGG16, VGG19, SqueezeNet, DenseNet-121, DenseNet-201, and InceptionResNetV2 are used. In the experimental results, their classification abilities on the identical flower dataset are contrasted. In trials, it has been found that the InceptionResNetV2 model performs better than other models. For the flower dataset, the InceptionResNetV2 model yields a maximum accuracy of 92.25%

A neural network (NN) classifier is advised for them in the method for identifying blooms. The suggested approach depends on textural highlights, like discrete wavelet change (DWT) and Gray level co-event network (GLCM). An edge-based technique is used to divide up a bloom image. The educational collection includes distinct floral images that look similar. The database of bloom images mixes their own photography and pictures found on the Internet. Using what may be considered GLCM characteristics, the ANN was trained on 50 instances to order 5 classes of flowers and obtained arrangement accuracy of over 85%.

In this paper, they say that classifying flowers can be difficult because there are so many species of flowering plants that are similar in shape, color, and appearance, according to the authors of this article. Field monitoring, plant identification, medicinal plant research, the floriculture sector, and plant taxonomy studies are some of the applications for flower categorization. According to the authors, current developments in deep learning techniques, particularly CNN and CNN transfer learning, have been presented and assessed in their study. A prototype CNN model structure is developed using a publicly accessible flower dataset, and a transfer learning method is also tested on the VGG16, MobileNet2, and Resnet50 architectures.

The suggested work will try to classify the input image of the designated flower species using the provided dataset. And it produces a result that categorizes the flowers in the supplied image. Convolution neural networks, a machine learning approach, are used in this study proposal to accurately identify floral species. The floral image extraction function is carried out using a Pre-Trained Network Extraction of Complex Features. A machine learning classifier like Logistic Regression or Random Forest is also utilized to produce a greater precision score.

The endurance of a deep convolutional neural network is demonstrated in this study (CNN). They first compare and analyze the output of well- known CNNs like AlexNet, CaffeNet, and GoogleLeNet to determine which network is the best. They found that GoogleNet archives functioned best. An accuracy rate of 67.45% at rank 1 and 90.82% at rank 10 is recorded for a floral dataset of 967 species collected from PlantCLEF 2015.

The authors propose a unique two-step deep learning classifier for classifying flowers from various species. To enable the localization of the smallest bounding box around it, the floral region is automatically divided into pieces. The suggested flower segmentation technique is represented as a binary classifier in a fully convolutional network framework. In phase two, they create a potent convolutional neural network classifier to distinguish between the numerous flower kinds. They recommend certain steps to follow throughout the training phase in order to guarantee dependable, accurate, and timely classification. They evaluate their methods using three popular flower datasets. Their classification scores surpass 97% across all datasets, which is better than the state-of-the-art in this discipline.

The classification of flowers using an artificial neural network (ANN) classifier is suggested in this research. The proposed method is based on the discrete wavelet transform, the Gray level co-occurrence matrix (GLCM), and other textural properties. A threshold-based approach is used to segment a floral image. The data set contains several, similar-looking flower images. Both our own photos and pictures retrieved from the Internet are included in the database of floral pictures. To classify five different species of flowers, the ANN was trained using 50 samples, and it relied solely on GLCM features to achieve a classification accuracy of more than 85%.

They created this research because it is crucial to automatically identify and recognize medicinal plant species in surroundings like woodlands, mountains, and dense places if they are to be found. In recent years, plant species have been determined by the shape, geometry, and texture of various plant components, including leaves, stems, flowers, etc. There are several methods for classifying plant species based on their blooms. Although there are techniques to visually search for a query image that contains a flower in modern search engines, this method isn't particularly reliable because there are millions of different types of flowers in the globe. Convolutional neural networks (CNN) are used in a deep learning approach to properly identify floral species. They have extracted some methods like Local Binary Pattern (LBP), Color Channel Statistics, Color Histograms, Haralick Texture, Hu Moments, and Zernike Moments. They have got accuracies of 73.05%, 93.41%, and 90.60% and used the FLOWERS 102 dataset.

In this research, an enhanced and generalized deep convolutional neural network that integrates Single Short Detector (SSD) and a Faster- Recurrent Convolutional Neural Network is used for object identification, localization, and classification (Faster-RCNN). For ResNet 50, ResNet 101, Inception V2, and Mobile Net V2, among other pretrained models, 2000 images were given. In this study, 30% of the images were used for training, 5% for validation, and 70% for testing. They have recommended the Faster-RCNN model, according to an experiment, delivers an ideal mAP score of 83.3% with 300 and 91.3% with 100 proposals for the ten floral classes. With key details like flower names, class classification, and multilabeling techniques, the recommended model could also find, classify, and identify flowers.

They utilized characteristics like texture and color to categorize flowers. Studies have made use of common flower databases. Preprocessing methods are used for the input photographs, such as segmentation for background removal and noise reduction. To extract texture and color information, they used segmented pictures.
While the Color Moment approach is used to extract color data, the GLCM (Gray Level Co- occurrence Matrix) method is used to extract texture features. For classification, a neural network classifier is used. Finally, the method is accurate 95.0% of the time.

The Oxford 102 flowers dataset, which includes 8189 flower images from 102 distinct flower species and ranges in size from 40 to 251, was used in this study as a benchmark dataset. They either purchased the images directly from photographers or discovered them online. Using image processing techniques and artificial neural networks, they have developed a flower recognition system for the Oxford 102 flowers dataset (ANN). The foreground (the floral item) was then separated from the background using picture segmentation (the rest of the image). All available color, texture, and form descriptors—HSV for color GLCM for texture, and Invariant Moments (IM) for shape were used for the features extraction. Finally, they have a classification process using a back-propagation artificial neural network (ANN). With regard to accuracy, they scored 81.19%.

They have suggested deep learning models utilizing the two networks VGG16 and ResNet50 to identify large-flower chrysanthemums. Dataset A, which comprised 14,000 images for 103 cultivars, and Dataset B, which contained 197 images from various years, were among the collections. In order to train the networks and evaluate the calibration accuracy (Top-5 rate of over 98%) and model generalization performance (Top-5 rate of above 78%), respectively, both datasets A and B were used. To further explore how the deep learning network classifies chrysanthemum cultivars, they have included clustering analysis and gradient-weighted class activation mapping (Grad-CAM) visualization.

LITERATURE SURVEY

The below list (**TABLE I)** outlines survey of papers related to the topic in brief with possiblegaps/limitations within the proposed system.

Papers	Title	Authors	Year Of Publication	Proposed system	Gaps
[1]	FLOWER RECOGNITION USING MACHINELEARNING	Sunil Bhutada, K.Tejaswi andS.Vineela	2021	The text-based flower classification and recognition uses current flowers and their featuresto identify their qualities.	The classification recognition of floweris based on text processing.
[2]	Flower Recognition Using Deep Learning	Rohit Sangale, Rushabh Jangada,Anshu De, NikhilSanga	2020	A methodology for flower recognition is based on CNN and the input is tookfrom existing data set.	The methodology willwork only for the existing data
[3]	FLOWER RECOGNITION MODEL BASED ON DEEP NEURALNETWORK WITH VGG19	Zi Yuan Ong , Kah Kien Chye ,Huay Wen Kang	2022	The methodology use for flower recognition is VGG19 and ResNet50	The AlexNet will givemore accuracy then VGG19.
[4]	A Study on CNNBased Transfer Learning for Recognition of Flower Species	Ferhat Bozkurt	2021	The methodology uses VGG16,VGG19, SqueezeNet, DenseNet-121, DenseNet-201 for classification of flower species.	It became hard to distinguish flower processes
[5]	Automated Flower Species Detection and Recognition usingNeural Network	Deepti.Aralikatti, Vinuta.Bangarshettar, Ashwini.Koti, Shree.Halbhav	2020	The methodology used was Gray level co-event grid (GLCM) and discrete wavelet change (DWT). Which take only textural as the input	As they have used the textural as the input it has failed in cases as ithas given same values for different flowers
[6]	Flower classificationusing CNN and transfer learning in CNN-Agriculture Perspective	Ms.Chhaya Narvekar	2020	The methodology used was transfer learning in CNN. And they have examined on VGG16, MobileNet2 and Resnet50	They have trained the machine with only one flower in this case it will show less accuracy with other flowers

[7]	**IMAGE CLASSIFICATION OF THE FLOWER SPECIES IDENTIFICATION USINGMACHINE LEARNING**	**G.Christopher, N.Jahnavi, V.Sai Syamala, G.Sarath Kumar**	**2022**	**The methodology was CNN and Machine learning method is used in this study proposal to precisely identify floral species.**	**This methodology won't yield better results because they just used one featurevector.**
[8]	**Flower species identification usingdeep convolutionalneural networks**	**Thi Thanh Nhan Nguyen, Van Tuan Le1Thi Lan Le1, Hai Vu1 Natapon Pantuwong3, Yasushi Yagi4**	**2016**	**CNN search as AlexNet, CaffeNet, and GoogleLeNet where usedfor comparative study**	**For a dataset with several classes, the accuracy at Rank 10is higher than 90%. The accuracy found for Rank 1 is still constrained**
[9]	**Flower classificationusing deep convolutional neural networks**	**Hazem Hiary, Heba Saadeh,Maha Saadeh**	**2018**	**They have proposed a two-step approach for flower recognition usingCNN and FCN methods**	**1/16 image of data setwas mismatched**
[10]	**Flower Classification Using Neural Network Based ImageProcessing**	**Dr.S.M.Mukane', Ms.J.A.Kendule**	**2016**	**The methodology used was Gray level co-event grid (GLCM) and discrete wavelet change (DWT). Which take only textural as the input**	**This system is trainedonly to recognize static images. LED reflectors are used which increases the cost.**
[11]	**Flower Species Recognition System using Convolution Neural Networks andTransfer Learning**	**I.Gogul, V.Sathiesh Kumar**	**2017**	**The methodology they used in this is CNN and they have used the local binary pattern(LBP) method takes textural as the input**	**The textual input many change the accuracies of outputwhich be failure in proper recognizing flower**
[12]	**Deep Neural Networks for Automatic Flower Species Localizationand Recognition**	**Touqeer Abbas ,Abdul Razzaq**	**2022**	**The methodology they have used is Faster- Recurrent Convolutional Neural Network (Faster- RCNN), Single Short Detector (SSD) and deep convolution neural network(DCNN)**	**In the use of DCNN inthey module it takes more data for training of machina and it takes more time as well**
[13]	**Flower Classificationusing Texture and Color Features**	**Riddhi H. Shaparia**	**2017**	**In this they used texture and color features are extracted from the segmented images. Texturefeature is extracted using GLCM (Gray Level Co- occurrence Matrix) methodand color feature is extracted using Color moment**	**In the use of texter asthe input the outcomeresult may not be much accuracies**

[14]	**A Flower Recognition System Based On Image Processing AndNeural Networks**	**Huthaifa Almogdady, Dr. Saher Manaseer**	**2018**	**The methodology used is ANN.The features extraction, all of color, texture and shape have been used, (HSV color descriptor, Gray Level Co- occurrence Matrix (GLCM)as texture descriptor**	**As the text was the input in case the outcome accuracies will not be as expectedThey will be more variation**
[15]	**Deep learning for image-based large-fowered chrysanthemum cultivar recognition**	**Zhilan Liu , JueWang**	**2019**	**In this they have used only two networks VGG16 and ResNet50 for large flower detection**	**They are only detecting only large flower if user give theinput as small flowersthey the machine willnot detect**

PROPOSED METHODOLOGY

Convolutional neural networks, a highly effective model for picture classification, are used to create the suggested flower recognition system. When training CNN models, a set of flower photos and their labels are first fed into the system. Then, a series of layers—including convolutional, ReLU, pooling, and fully connected layers—are applied to these images. These pictures are taken in groups. Small features are initially extracted by the model, and as training advances, more intricate features are extracted.

Throughout the training phase, the model picks up traits and patterns. When a new flower image is supplied as input, the name of the flower is later determined using this data.

The model is integrated into a web application for nursery. As a result, the user can use their camera or cell phone to capture a photo of the bloom. The user can then upload the image to the online app and use the search button. After loading the model, recognition will take place. Along with information about the nursery where it is sold, the information on the plant is also displayed.

The availability and specifications of the wonderful flower plants that you just saw can more easily be discovered using this method.

CONCLUSION

The greatest method to recognize a plant is by its flower, which is its most appealing feature. Knowing more about the plant can therefore be gained by identifying the blossom. The suggested system accepts as input an image of a flower and outputs the flower's common name, family name, and the nursery where it was accessible. The proposed approach is extremely trustworthy because the model is a convolutional neural network, which has established itself as one of the most effective picture categorization techniques. The technology becomes more helpful by identifying the bloom and showing the user where to find the plant. The model was also implemented into a web application.

REFERENCES

[1.] Flower Recognition using Machine learning. Sunil Bhutada, K.Tejaswi and S.Vineela(2021). [2.] Flower Recognition Using Deep Learning. Rohit Sangale, Rushabh Jangada, Anshu De, Nikhil Sanga(2020).

[3.] Flower recognition model based on deep neural network with VGG19. Zi Yuan Ong , Kah Kien Chye , Huay Wen Kang(2022).

[4.] A Study on CNN Based Transfer Learning for Recognition of Flower Species, Ferhat Bozkurt(2021).

[5.] Automated Flower Species Detection and Recognition using Neural Network Deepti.Aralikatti, Vinuta.Bangarshettar, Ashwini.Koti, Shree.Halbhav(2020).

[6.] Flower classification using CNN and transfer learning in CNN- Agriculture Perspective, Ms.Chhaya Narvekar(2020).

[7.] Image classification of the flower species identification using machine learning, G.Christopher, N.Jahnavi, V.Sai Syamala, G.Sarath Kumar(2022).

[8.] Flower species identification using deep convolutional neural networks, Thi Thanh Nhan Nguyen,Van Tuan Le1 Thi Lan Le1, Hai Vu1 Natapon Pantuwong3, Yasushi Yagi4(2016).

[9.] Flower classification using deep convolutional neural networks, Hazem Hiary, Heba Saadeh Maha Saadeh (2018).

[10.] Flower Classification Using Neural Network Based ImageProcessing, Dr.S.M.Mukane', Ms.J.A.Kendule(2016).

[11.] Flower Species Recognition System using Convolution Neural Networks and Transfer Learning I.Gogul, V.Sathiesh Kumar, 2015.

[12.] A Flower Recognition System Based On Image Processing And Neural Networks Huthaifa Almogdady, Dr. Saher Manaseer, 2018.

[13.] Flower Classification using Texture and Color Features Riddhi H. Shaparia, 2017.

[14.] Deep Neural Networks for Automatic Flower Species Localization and Recognition Touqeer Abbas , Abdul Razzaq , 2022.

[15.] Deep learning for image-based large-flowered chrysanthemum cultivar recognition Zhilan Liu, Jue Wang, 2019