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Flower Classification Using Deep Learning

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Abstract:

Image features can be utilized for image classification. Convolutional Neural Network (CNN) is able to extract features automatically from images rather than collecting features by hand. There are more and more flower images on the internet, and it is necessary to develop a system for identification of flower type. In this system, we collect flower images from the internet and label them according to the species, then by using a deep CNN. In the field of computer vision, image classification has become a hot research topic in recent years, and has made great progress. With the development of electronic technology and mobile technology, people can easily access a variety of images (such as flowers, pets, etc.). Flower classification system and can be classified into four principles categories; knowledge based, feature invariant, template matching and appearance-based methods. In classification, two stages are required; training process and evaluation process. However, without the identification of specific species, we cannot deal with the images efficiently. Thus, in or-der to solve the problem, the research field of domain-specific image classification is greatly developed, which classifies images within a specific domain. Flower images own the following two points:

1) Different types of flowers are very similar in the close colour and similar petals;
2) The same type of flowers varies widely in different flowering phases, easy deformation and withered petals.

Therefore, the flower image classification has a good representation in the domain-specific image classification. In a training process, the algorithm is fed samples of the flowers to be learned and a distinct model for each flower is determined while in an evaluation process, a model of a newly acquired test flower is compared against all existing models in the database. Then the near corresponding model is acquired to determine whether the classification is triggered. In this stage, a statistical procedure is used to on a collection of flower images to form a set of basis features, which is called a set of masked flowers. Any flower image can be considered to be a combination of these standard flowers.

Keywords **—Deep Learning, classification, Convolutional neural network, feature extraction.**

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I. INTRODUCTION

There are two parts vital to the success of this system; detection and classification. An area detection is one of the most important steps in a flower classification system and can be classified into four principles categories; knowledge based, feature invariant, template matching and appearance-based methods. In classification, two stages are required; training process and evaluation

process. In a training process, the algorithm is fed samples of the flowers to be learned and a distinct model for each flower is determined while in an evaluation process, a model of a newly acquired test flower is compared against all existing models in the database. Then the near corresponding model is acquired to determine whether the classification is triggered. In this stage, a statistical procedure is used to on a collection of flower images to form a set of basis features, which is called a set of masked flowers. Any flower image can be considered to be a combination of these standard flowers.

II. LITERATURESURVEY

In the system [1]The most beautiful thing on earth is a flower. There are several flowers around in our hectic life. There are currently around 352,000 different species of flowers. The overall number of species in Bangladesh is not very high, and they are moving away from the country's scenic surroundings and integrating themselves into urban life. Even now, most people can't name more than ten of the area flowers by name. An technique is suggested to solve the issue and identify the native flower of Bangladesh. The proposed technique in this system will be helpful to botanists as well as experts in other domains. Using machine learning techniques, object recognition from a picture is currently a very promising field.

Typically, a species can be identified by its stem, the distance between its internodes, its leaves, its culm-sheaths, its flowers, etc. In this study, a novel method for bamboo species identification utilising digital image processing is discussed.

For classification[2], the proposed study makes use of stem and leaf traits. Additionally, a new algorithm is created to simplify our method and get rid of stem and leaf features that overlap. By taking pictures of bamboo components with a high-resolution camera, a database is produced. Techniques for digital image processing are applied in this case for classification. In this location, there is yet no specific programme for identifying species.

Image classification can make use of image features. Instead of manually gathering features from images, Convolutional Neural Network (CNN) can extract features automatically. The number of flower photographs on the internet is growing [3], hence a system for classifying different flower varieties must be created.

Using a deep CNN to learn the salient aspects of the flower photos, we reach a substantial performance of 78 percent in terms of classification accuracy in this study. The system receives flower images from the internet and classifies them according to the species.

The [4] method suggests two experiments to measure the sufficiency and salience of created explanations in order to statistically assess their quality. The system must assess a trained CNN's capacity to correctly identify an explanation in order to determine whether it includes enough data to be classified. These methods compare the classification precision and recall of two new CNNs trained on different sets of test data, one utilising explanations as training data and the other on raw picture data, to determine the relevance of explanations. We put our new evaluation methodology to the test in order to see if LIME can indeed produce sufficient and salient explanations.

For issues involving picture recognition and classification, deep learning techniques are frequently used. Deep learning architectures have gradually changed to include additional layers and improve their stability for categorization issues. The base VGG16 model is adjusted in the suggested method to classify flowers into Daisy, Dandelion, Sunflower, Rose, and Tulip flowers, as well as another five categories.

3520 flower pictures were used in training the refined VGG16 model. The model's [5] classification accuracy was 95.00% for the testing dataset and 97.67% for the validation set. The suggested fine-tuned VGG16 model is trained, validated, and tested using the Kaggle dataset.

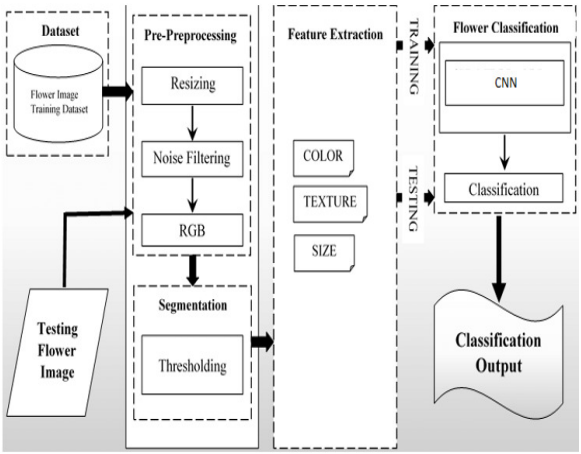
III. OBJECTIVE

In this report a Flower Classification System is presented, one that classifies and provides the information from an input random flower image which has the following objectives.

1. Design and develop a flower classification system.

2. Help researchers classify flowers.
3. Provide 24X7 access to system
4. Remove physical barriers by providing an online interface.
5. Used python Django to ensure high-security.

IV. ARCHITECTURE



STEP 1- PRE-PROCESSING

Take an image of the flower training dataset first, then perform the Pre- Processing operation. It is not always possible to obtain clean or formatted Flower Classification during Pre-Processing. Using Deep Learning data, and while performing this operation with this data, it must be cleaned and formatted. Various operations, such as RGB and noise filtering, are carried out in Pre-Processing.

STEP 2 – FEATURE EXTRACTION

Take an image of the flower training dataset first, then perform the Pre- Processing operation. It is not always possible to obtain clean or formatted Flower Classification during Pre-Processing. Using Deep Learning data, and while performing this operation with this data, it must be cleaned and formatted. Various operations, such as RGB and noise filtering, are carried out in Pre-Processing.

STEP 3 – FLOWER CLASSIFICATION

Convolution is the first layer in CNN. A feature map is created in this layer by detecting different patterns in the input image. Using that pattern, the image is classified, and the result is displayed as the flower's name.

V. EXPECTED RESULT

Our system will produce a text output that is the name of a flower as its experimental output.

VI. CONCLUSIONS

The proposed flower segmentation approach is modelled as a multi-class classifier in a fully convolutional network framework. Second, they build a robust convolutional neural network classifier to distinguish the different flower types. They propose novel steps during the training stage to ensure robust, accurate and real-time classification. We evaluate our method on well-known flowers. Our classification results exceed good accuracy on testing dataset, which are better than the state-of-the-art in this domain.

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