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Conceptual Architecture of Automatic Medicinal Plants Identification System for Manudevi Region

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ABSTRACT: Manudevi forest in Jalgaon district of Maharashtra having ample flora and fauna of medicinal values. Finding expected medicinal plant is not an easy task for common person. This is motivated to propose the conceptual architecture of automatic medicinal plants identification system for Manudevi region. The architecture of the proposed system will take photographs of the plants from Manudevi region as input. With the use of image processing techniques, the photographs are processed and converted into computers understanding format. The proposed identification system will be useful for developing the standard corpus of medicinal plants. With the help of the corpus prepared system can make the task of identification of medicinal plants available at Manudevi forest.

KEYWORDS: Manudevi forest, Medicinal plants, Plants identification, Image processing

I.INTRODUCTION

In India, medicinal plants are traditionally important since they are used in the Ayurveda treatment of many diseases. Manudevi forest in Jalgaon district of Maharashtra having ample flora and fauna of medicinal values. The identification of the plants is difficult task for a common person. To help to common persons, application or system can be developed which can identify the plant from photographs taken. But it is obvious to confirm from the experts in the field. Therefore, anyone can use the application in the forest region and then can use the medicinal plants for processing by confirming from experts. This system has extensive use of image processing techniques. The major need of the system is proper development of standard corpus of medicinal plants in computers understanding format. This paper describes the conceptual architecture for automatic medicinal plants identification system for Manudevi region in Maharashtra. The paper is divided into V sections. Section II gives detailed literature survey. Methodology is explained in section III. The system implementation involves many difficulties and challenges which are described in section IV. Conclusion and future work are specified in section V.

II. LITERATURE SURVEY

The literature study is performed to learn about the significance of the system and study about the implementation of the system.

Gross Jürgen et. al. in 2019,given an innovative attempt for the collection, identification, and statistical analysis of volatile organic compound (VOC) patterns emitted by phytoplasma-infected plants compared to healthy plants [1].
Saleem G et. al. in 2019,have done study for analysing visual leaf shape features automatically for plant classification. Besides this they discussed various difficulties identified [2].
Wu Jingui et. al. in 2019, have given algorithm for recognizing ripening tomatoes automatically. They have used Bi-layer classification approach using multi-feature fusion [3].
Pearline S. Anubha et. al. in 2019, have studied and described two basic approaches such as conventional image processing and deep learning for plant recognition. Feature extraction, classification using extracted features, and architectures supporting deep learning are given [4].
Shamir Lior et. al. in 2019 in collected images of buildings are captured using Google StreetView from 18 cities and three countries. They trained a machine vision system. This system identifies the geographical location of the image automatically using computer analysis [5].

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SethyPrabira Kumar et. al. in 2019, have used digital image processing techniques for detecting diseased leaves of pumpkin. It helps to recommend the detection of early disease. They have used segmentation algorithm which uses k-means clustering and principal component analysis [6].
Pankaja, K., and V. Suma in 2019, have used Flavia dataset for applying automatic leaf image identification model using feature extraction methods of digital image processing [7].
Firdousi S. A., and T. A. Khan in 2015, identified two new fungal diseases of trees of Manudevi forest of Jalgaon district in Maharashtra [10]
The literature study shows that the proposed system of automatic identification of medicinal plants for Manudevi region and will be significantly useful system.

III. METHODOLOGY

This section describes the methodology for implementing proposed system "automatic identification of medicinal plants for Manudevi region".
The system will need to design a proper corpus of medicinal plants images generally available in Satpuda region of Maharashtra. These images need to be stored in computer understandable format. Fundamental steps in digital image processing are applied to all the medicinal plant images which are stored in the corpus. After acquisition of the images, these images are adjusted so that they will be suitable for next steps of image analysis. Colored images are handled and are represented in grey scale. Further, the steps of multiresolution processing, compression, morphological processing, segmentation are performed [12]. After this a label is get assigned to recognize the analysed image. The machine learning techniques are applied to train the system using the standard annotated corpus images. These trained images then will used to test the candidate medicinal plant that the user of the system may wish to identify. Before applying the candidate image to test using machine learning techniques, the candidate image is required to be processed. This process will be similar which is applied to corpus images. The complete methodology explained above is represented in the following figure 1.

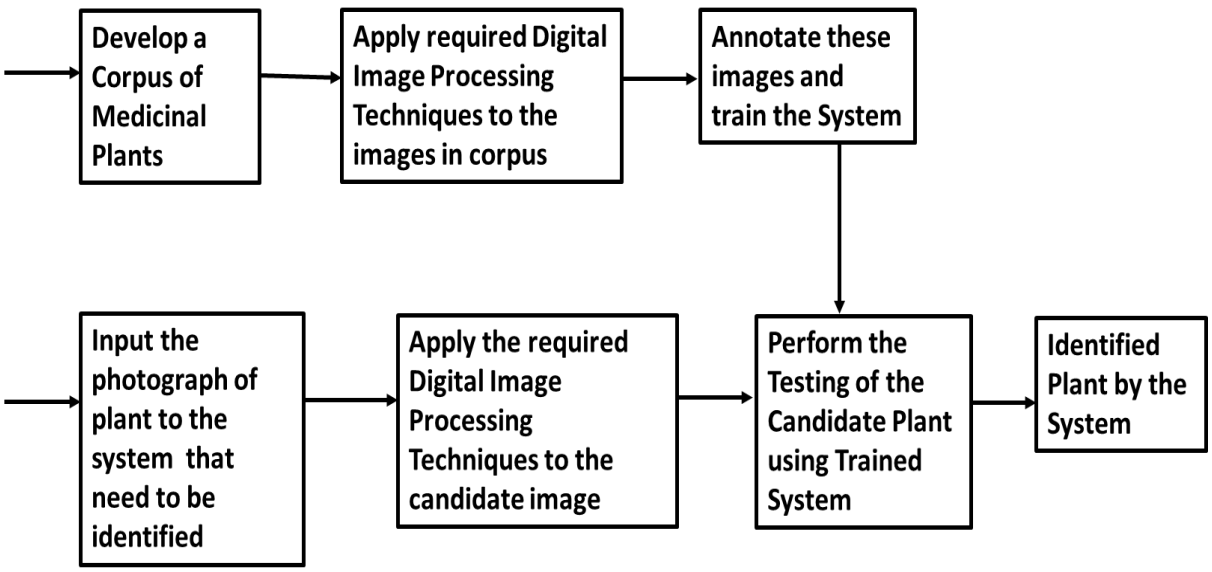

Figure 1. Proposed System of Automatic Identification of Medical Plants

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IV. DIFFICULTIES AND CHALLENGES

The implementation of the proposed system has several difficulties. One of the challenge required to face is to minimize the difference between original plant and its equivalent processed image. These differences may come due to effects of light, variations due to position and orientation used while taking photo. System should be trained in such manner that it should be able to identify the candidate plant though it will have differences in leaf shape, change in leaf color due to environment effects. This will be important challenge in which proper selection of the plant must be done[2].

V.CONCLUSION

The role of development of automatic medicinal plant identification system for Manudevi forest region will be significant. The experts who can identify the plants cannot always visit to forest when the plants are needed for preparation of medicines. The proposed system can prove helpful in such cases to anyone who wish to identify the plants. The performance of the system will depend on the availability and system's understanding of medicinal plants stored in corpus. It will also be varying on the quality of plant photographs taken for identification.

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