IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 1, January 2023
Impact Factor: 6.252

Automatic Image Segmentation for the Detection of Illness in Cash Crops Extended Data Set Method & Deep Learning

Prof. Jayantkumar Rathod[1], Abhishek[2], Bhuvana[3], Sathwik U Shetty[4], Shivaraj[5]
Associate Professor, Department of Information Science and Engineering[1]
Students Department of Information Science and Engineering[2,3,4,5]
Alva's Institute of Engineering and Technology, Mijar, Mangalore, Karnataka, India

Abstract: *The economy of our country heavily depends on agrarian produce. This is the driving force behind Recognizing unhealthy leaves is the key to preventing crops from declining and yield from declining. It required a tremendous amount of labour, knowledge of the leaf diseases, and a tremendous lot of time. As a result, methods for image processing are used to find and identify unhealthy plant leaf conditions. Automatically identifying plant leaf diseases is helpful because it reduces the laborious task of observing in large farms and identifies disease symptoms right away. The stages of image acquisition, image pre-processing, picture segmentation, feature extraction, and classification are involved in the detection and identification of plant leaf diseases. The methodologies for pre-processing images, picture segmentation algorithms for automatic recognition, and research on potential plant leaf disease classification algorithms are all included in this work.*

Keywords: Image processing; segmentation; Support Vector Machine; Decision Support System.

I. INTRODUCTION

India is one of the developing countries wherein majority of population of country is depends on agriculture and agricultural production [8]. Studies show that the plant leaf disease reduces the quality and quantity of agricultural products. Therefore detect and identify disease at early stage is important task for farmers. Detection of disease at early stage can save the whole crops from a disease. The identification and recognition of plant leaf disease by open naked eye is quite difficult task for farmers and consult scientist or expertise person is very costly for farmers in our developing countries like India. However, illnesses are a significant factor in India's declining agronomics. In order to control crop diseases, farmers must deal with a number of challenges. In the agricultural industry, illness detection is crucial, and doing so requires careful diagnosis and the right kind of surveillance to prevent catastrophic losses.

Therefore, consider for quick, low cost and precise way to automatically recognize and identify disease from the leaf of plants is of pragmatic significance for large farms. The present Decision Support Systems (DSS) are establish on call center need that the farmers have to convey details about plant leaf through orally. DSS based on image processing can be useful to improve the production of agriculture.

II. LITERTURE SURVEY

[1]. Plant Leaf Disease Classification Using Efficient Net Deep Learning Model Ümit ATİLAa, Murat UÇARb:

Deep learning techniques have lately gained popularity for pattern identification and image processing. The PlantVillage dataset's plant leaf images from 39 classes were to be classified using the EfficientNet deep learning architecture, which was proposed in this work. The effectiveness of the suggested design was evaluated in comparison to cutting-edge deep learning architectures utilised in the literature for plant leaf disease detection. Both the original and the expanded versions of the PlantVillage dataset were used for experimental experiments.

[2]. Development and Validation of a Deep Learning Algorithm for the Recognition of Plant Disease Sijiang Huang, Weijie Liu:

We discovered that various plant diseases, such as tomato scab and speck, had poor recognition performances in the experimental results of this paper. In order to improve the efficacy of these diseases' recognition, we will expand our

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 1, January 2023
Impact Factor: 6.252

investigation into these perplexing diseases and extract more texture features. The leaf segmentation network and the plant disease classification network will also be combined into one in the future so that the two modules can exchange data and increase accuracy. which means technology in our model have great potential to become the basis of fully automatic reliable plant disease classification system.

[3]. Deep learning models for plant disease detection and diagnosis Konstantinos P. Frontino's:

Specialized deep learning models were developed, based on specific convolutional neural networks architectures, for the identification of plant diseases through simple leaves images of healthy or diseased plants. The training of the models was performed using an openly available database of many photographs, taken in both laboratory conditions and real conditions in cultivation fields Based on that high level of performance, it becomes evident that convolutional neural networks are highly suitable for the automated detection and diagnosis of plant diseases through the analysis of simple leaves images.

[4]. Detection of plant leaf diseases using image segmentation and soft computing techniques Vijai Singh a, A.K. Misra b:

An overview of different disease classification techniques used for plant leaf disease detection and an algorithm for an image segmentation technique that can be used for automatic detection and subsequent classification of plant leaf diseases. Bananas, beans, jackfruit, lemons, mangoes, potatoes, tomatoes, and sapotas are some of the 10 species against which the proposed algorithm will be tested. Therefore, diseases associated with these plants were used for identification. Optimal results were obtained with a very small amount of computation. This also demonstrates the efficiency of the proposed algorithm in leaf disease detection and classification. Another advantage of using this method is that plant diseases can be identified at an early or early stage. Artificial neural networks, Bayesian classifiers, fuzzy logic, and hybrid algorithms can also be used to improve the recognition rate of the classification process.through smart camaras.

[5]. Performance analysis of deep learning CNN models for disease detection in plants using image segmentation

Parul Sharma a, Yash Paul Singh Berwal b: When used on actual data, the majority of deep learning models for automatically detecting diseases perform worse. Photos not before seen. Here, we could observe the viability of convolutional neural network (CNN) model training.Using partial photos instead of segmented and annotated images. In comparison to training with whole images, the same CNN model performs better when segmented images are used. According to the information given, the performance of the images (F-CNN) model on independent data improves. Additionally, test dataset confidence increased significantly, as evidenced by quantitative study of self-classification confidence. Pre-processing of pictures before to model training in CNN can be quite helpful to obtain excellent real-world performance when richer datasets become available in the future.

[6]. Identification of Plant Disease using Image Processing Technique Abirami Devaraj, Karunya Rathan, Sarvepalli Jaahnavi and K Indira:

The current investigation focuses on Alternaria Alternata, Antracnose, Bacterial Blight, and Cercospora Leaf. Use MATLAB's image processing algorithms to find these automatically detected illnesses. An image is loaded, followed by steps for image preprocessing, segmentation, feature extraction, and classification. Using cutting-edge technology, such as image processing, the development of automatic detection systems helps farmers identify diseases at an early or beginning stage and provide useful information for their management. We might choose to focus more on expanding our work on disease identification in general.

[7]. Detection of Plant Leaf Disease Using Image Processing Approach Sushil R. Kamlapurkar:

The use of automated monitoring and control systems is gaining more and more demand as technology advances. There is a loss of yield in agricultural fields mainly due to widespread diseases. Mostly, the detection and identification of the disease is recorded at the time of the disease enters a difficult phase. Therefore, it causes loss in terms of revenue, time and money. The proposed system is able to detect the disease at an earlier stage, as soon as it appears on the leaf. In this way, it is possible to save the loss and to some extent reduce the dependence on the expert. It can provide help to a person who has less knowledge about the disease. Depending on these targets, we need to extract features corresponding to the disease.

[8]. A Modern Approach for Plant Leaf Disease Classification which Depends on Leaf Image Processing Chaitali G. Dhaware, Mrs. K.H. Wanjale:

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 1, January 2023
Impact Factor: 6.252

For the automatic classification of the unhealthiness of the leaves, a method focused on image processing is applied, which follows the image processing of the leaves. The project system can be used with uses from practical requirements, due to the images are immediately detained directly from the agricultural land without abundance effort required through farmers. The system approach will with minimal effort to provide advice to the farmer. Farmer most effective require capturing an image of a plant leaf with a mobile camera and transmit it to DSS, without any other inputs.

[9]. Identification of Plant-Leaf Diseases Using CNN and Transfer-Learning Approach Sk Mahmudul Hassan, Zbigniew Leonowicz:

There are many methods developed for the detection and classification of plant diseases using diseased plant leaves. However, there is still no effective and efficient commercial solution that can be used to identify diseases. In our work, we used four different DLs models (InceptionV3, InceptionResnetV2, MobileNetV2, EfficientNetB0) for the detection of plant diseases using the display of healthy and diseased plant leaves. Train and test the model. Compared to other deep-learning. The implemented deep learning model has better predictive ability in terms of both accuracy and loss. The time needed to train the model was much less than in other machine learning approaches. In addition, the MobileNetV2 architecture is an optimized deep convolutional neural network that limits the number of parameters and as many operations as possible and can be easily run on mobile devices.

[10]. How Convolutional Neural Networks Diagnose Plant Disease Yosuke Toda, Fumio Okura:

The CNN visualization shows the possibility of opening the black box of deep learning. The barriers to using deep learning techniques are getting lower every year. However, it is important for plant scientists to select appropriate network models and interpret the resulting ones Result. Visualization is effective for understanding what a deep network is learning and contributes to improving network architecture, such as model selection and parameter reduction. Our results suggest that even when visualization methods generate meaningful results, humans still play the most important role in evaluating visualization results by linking computer-generated results with expert knowledge, for example in plant science.

III. FUTURE SCOPE

The studies collected in this review show that plant disease classification is a domain with promising results, with some studies achieving very high results [13,67]. Diverse datasets have been employed, each with their own characteristics and associated difficulties: intraclass variability, background diversity, and different lighting and shading conditions during image acquisition. Due to these reasons, performance comparisons between the analyzed studies is not a straightforward task.

IV. CONCLUSION

Thus an application built for the identification of disease affected plants and healthy plants is done and this proposed work is focuses on the accuracy values during the real field conditions, and this work is implemented by having several plant disease images.

Overall this work is implemented from scratch and produces a decent accuracy. The future work is to increase the number of images present in the predefined database and to modify the architecture in accordance with the dataset for achieving better accuracy.

REFERENCES

[1]. Al-Hiary, H., Bani-Ahmad, S., Reyalat, M., Braik, M., Alrahamneh, Z., 2011. Fast and accurate detection and classification of plant diseases. Int. J. Comput. Appl. 17, 31–38.

[2]. Bock, C. H. , et al. ”Plant Disease Severity Estimated Visually, by Digital Photography and Image Analysis, and by Hyperspectral Imaging.” CRITICAL REVIEWS IN PLANT SCIENCES 29.2(2010):59-107.

[3]. Carranza-Rojas, J., Goeau, H., Bonnet, P., Mata-Montero, E., Joly, A., 2017. Going deeper in the automated identification of Herbarium specimens. BMC Evol. Biol.

[4]. Ghaiwat Savita N, Arora Parul. Detection and classification of plant leaf diseases using image processing techniques: a review. Int J Recent Adv Eng Technol 2014;2(3):2347–812. ISSN (Online).

[5]. Pydipati R, Burks TF, Lee WS. Statistical and neural network classifiers for citrus disease detection using machine vision. Trans ASAE 2005;48(5):2007–14.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 3, Issue 1, January 2023
Impact Factor: 6.252

[6]. Saradhambal .G , Dhivya. R, Latha. S, R. Rajesh "Plant Disease Detection and Its Solution using Image Classification" International Journal of Pure and Applied Mathematics. Volume 119 No. 14 2018, 879-884

[7]. Sanjeev S Sannakki, Vijay S Rajpurohit, V B Nargund, Pallavi Kulkarni"Diagnosis and Classification of Grape Leaf Diseases using Neural Networks" 4th ICCCNT 2013

[8]. Wan Mohd Fadzil, Shah Rizam, Jailani R, Nooritawati M.T, "Orchid leaf disease detection using Border Segmentation technique," IEEE Conference on Systems, Process and Control (ICSPC), Vol.1, pp.168- 179, December 2014.

[9]. Sethy, P.K.; Barpanda, N.K.; Rath, A.K.; Behera, S.K. Deep feature based rice leaf disease identification using support vector machine. Comput. Electron. Agric. 2020, 175, 105527.

[10]. R. Balodi, S. Bisht, A. Ghatak, and K. H. Rao, "Plant disease diagnosis: Technological advancements and challenges," Indian Phytopathology, vol. 70, no. 3, pp. 275–281, 2017.