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Image Based Plant Disease Detection

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Abstract: Agriculture is a major source of income in India, and the country's economy is heavily reliant on it. To maximize agricultural productivity and profit, it is critical to diagnose plant leaf diseases at an early stage. Because naked eye observation of diseases does not always yield reliable results, especially during the early stages, an image processing technique is utilized to detect leaf diseases accurately. It consisted of five steps: image acquisition, preprocessing of the acquired image, feature extraction, disease classification, and display of the results.. This work presents a thorough examination of the categorization of agricultural illnesses using the Support Vector Machine classifier. Recently, many works have been inspired by the success of deep learning in computer vision for plant diseases classification. Unfortunately, these end-to-end deep classifier slack transparency which can limit their adoption in practice. In this paper, we propose a new trainable visualization method for plant diseases classification based on a Convolutional Neural Network (CNN) architecture composed of two deep classifiers. The first one is named Teacher and the second one Student. This architecture leverages the multitask learning to train the Teacher and the Student jointly.Then, the communicated representation between the Teacher and the Student is used as a proxy to visualize the most important image regions for classification. This new architecture produces sharper visualization than the existing methods in plant diseases context.

Keywords: Image processing , Save Model, CNN, Leaf Disease, Matlab, Feature Extraction, Deep Learning, Leaf Dataset.

I. INTRODUCTION

Many of those in India are reliant on agriculture. They grow vegetables,fruits, and other crops while also cultivating high-quality products to make a profit, and they can't grow every crop in every season. Because of the climate, only certain crops were grown at certain times of the year. Some crops are specifically suitable for a specific climate, such as some vegetables, which grow well in one climate but not in another.Farmers focused solely on the product's quality since higher quality means higher profits. Many farmers faced numerous obstacles at the time, such as diseased leaves.

II. LITERATURE SURVEY

Survey on Plant diseases detection and Classifification Techniques Author Dr.B.Gomathy, V.Nirmala Description: Image processing has been a excellent tool for diagnosis of diseases in various medical fifield. In literature several works are carried out for leaf diagnosis also. In the disease detection process, the image acquired, preprocessed and free from noise.

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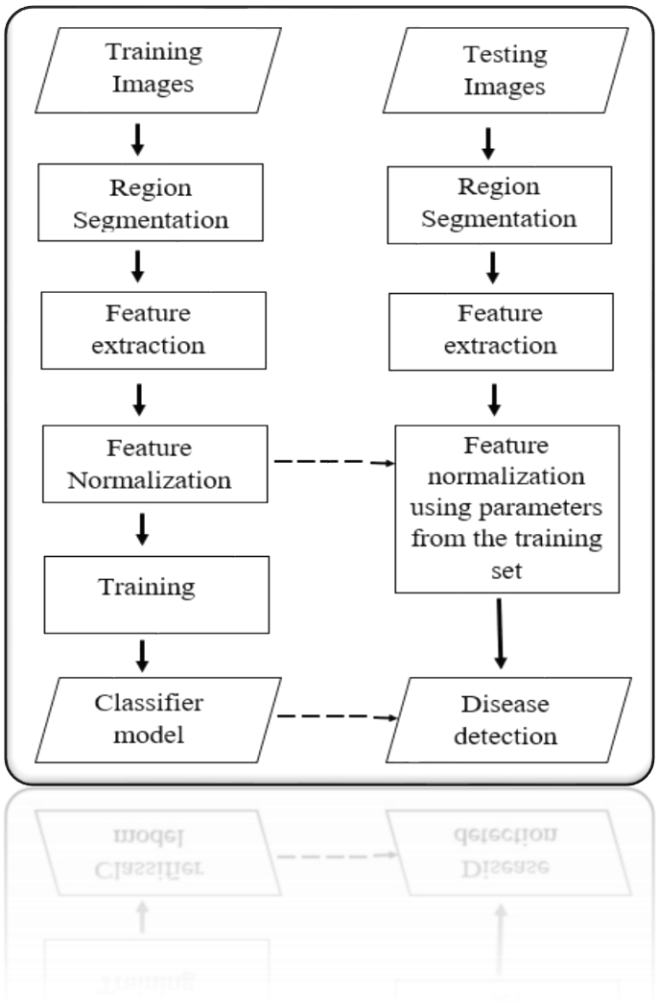
III. BLOCK DIAGRAM



IV. TECHNICAL REQUIREMENT

Software Requirement :

This is the software configuration in which the project was shaped. The programming language used, tools used, etc are described here.

1. Operating System : Windows
2. Front End : html,css,boostrap,javascript
3. Tool : Sublimetext3,pycharm
4. Database : MySQL

Hardware Requirement :

As this is an online application for product management we are not enabling or installing any hardware components for user interface.

It's not an embedded system

1. Processor - Pentium IV 2.4 GHZ
2. Speed - 1.5 Ghz and Above
3. RAM - 4 GB (min)
4. Hard Disk - 220 GB
5. Key Board - Standard Windows Keyboard
6. Mouse - Two or Three Button Mouse

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V. ADVANTAGES OF THE PROJECT

1. The advantages of the algorithm are simplicity and very high execution speed.
2. The leading objective of our paper is to enhance the value of plant leaf detection.
3. Simpler classifier as exclusion of any training process . Applicable in case of a small not trained dataset.
4. Faster Training Hidden layer is easier to interpret.
5. Simple geometric interpretation and a sparse solution. Robust , When sample has some bias.
6. Tolerant to noisy inputs , Instances Classified to many output adaptive to change data.

VI. LIMITATIONS

1. More training samples-more speed of computing distance sensitive to irrelevant inputs so expensive testing every time.
2. It is slower in execution speed.
3. Long training time . complex network structure . excessive memory for training data.
4. Learning can be slow . It is hard to know how many neurons as well as layers are required.
5. Slow training . Difficult to understand.for Classification large support vector required.

VII. CONCLUSION

This paper presents the dominance of the DL (deep learning) method over the classical ML (machine learning) algorithms. Both the simplicity of the approach and the achieved accuracy confirm that the DL is the way to follow for image classification problems with relatively large datasets.
As the achieved accuracy of the DL method is already very high, trying to improve its results on the same dataset would be of little benefit. Further work with the DL model could be done by expanding the dataset with more diverse images, collected from multiple sources, in order to allow it to generalize better.
The considered ML algorithms achieved relatively high accuracy, but with error rates still an order of magnitude higher than the DL model.

REFERENCES

[1] Explainable Image Caption Generator Using Attention and Bayesian Inference,Seung-Ho Han and Ho-Jin Choi,School of Computing, KAIST Daejeon, Korea (South), Email: {seunghohan, hojinc}@kaist.ac.kr (2018)
[2] Domain-Specific Image Caption Generator with Semantic Ontology Seung-Ho Han and Ho-Jin Choi School of Computing, KAIST Daejoen, Republic of Korea {seunghohan and hojinc}@kaist.ac.kr (2020)
[3] Image Captioning with Generative Adversarial Network Soheyla Amirian∗, Khaled Rasheed† , Thiab R. Taha‡ , Hamid R. Arabnia§ The University of Georgia Athens, Georgia, USA (2019)
[4] Deep Learning based Automatic Image Caption Generation Varsha Kesavan, Vaidehi Muley, Megha Kolhekar, Electronics and Telecommunications Fr. Conceicao Rodrigues Institute of Technology, Mumbai University Sector-9A Vashi,Navi Mumbai,India. (2019)
[5] Topic-Oriented Image Captioning Based on Order-Embedding Niange Yu, Xiaolin Hu*, Senior Member, IEEE, Binheng Song, Jian Yang, and Jianwei Zhang (2015)
[6] Image Caption Generation using Deep Learning Technique Chetan Amritkar, Vaishali Jabade, Department of EnTC Vishwakarma Institute of Technology Pune, India. (2018)
[7] A New CNN-RNN Frame work for remote sensing image captioning , Genc Hoxha, Farid Melgani, Jacopo Slaghenauffi (2020)
[8] Show and Tell: A Neural Image Caption Generator Oriol Vinyals, Alexander Toshev Google, Samy Bengio Google, Dumitru Erhan Google (2015)
[9] Comparative evaluation of CNN architectures for Image Caption Generation Sulabh Katiyar, Samir Kumar Borgohain Department of Computer Science and Engineering National Institute of Technology, Silchar Assam, India 788010 (2020)
[10] https://medium.com/@RaghavPrabhu/cnn-architectures-lenet-alexnet-vgg-googlenet-and-resnet-7c81c017b848#:~:text=VGG%2D16%20is%20a%20simpler,2%20with%20stride%20of%202.&text=The%20winner%20of%20ILSVRC%202014,also%20known%20as%20Inception%20Module.