

Plant Leaf Disease Detection Using CNN

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Abstract- This project deals with the 'PLANT LEAF DISEASE DETECTION USING CNN'. The system is used for Early Disease Detection and pests are important for better yield and quality of crops. With Reduction in Quality of the agricultural Product, Disease Plant can lead to the huge Economic Losses to the Individual farmers. In country like India whose major Population is involved in Agriculture It is very important to find the disease at early stages. Faster and precise prediction of plant disease could help reducing the losses.

I. INTRODUCTION

Today's better technologies have enabled people to provide the adequate nutrition and food needed to meet the needs of the world's growing population. If we talk about India unequivocally, 70% of the Indian people is directly or by suggestion related to the cultivating territory, which remains the greatest region in the country. If we explore the broader Picture According to Research Conducted by 2050 overall yield creation can augment by at any rate half putting more weight on the inside and out pushed and cultivating Sector. The greater part of the Farmers is poor and have no inclination in development which may incite hardships more essential than half because of pests and sicknesses of plant. Vegetables and fruits are common items and the principal agricultural things. Powerful dependence on engineered pesticides achieves the high substance content which creates in the earth, air, water, and shockingly in our bodies antagonistically influence the environment. At present, the conventional technique of visual inspection in humans by visual inspection makes it impossible to characterize plant diseases. Advances in computer vision models offer fast, normalized, and accurate answers to these problems. Classifiers can also be sent as attachments during preparation. All you need is a web association and a camera-equipped cellphone. The well-known business applications "iNaturalist" and "Plant Snap" show how this is possible. Both apps excel at sharing skills with customers as well as building intuitive online social communities. In Recent Years, Deep Learning has led to great performance in various fields like Image Recognition, Speech. Recognition, and Natural Language Processing. The use of the Convolutional Neural Network in the Problem of Plant Disease Detection has very good results. Convolutional Neural Network is recognized as

the best method for Object Recognition. We Consider the Neural Architecture namely faster Region-Based Convolutional Neural networks (Faster R-CNN), Region-based Convolution Neural Networks (R-FCN), and single-shot Multi box detector (SSD). Each of the Neural Architecture should be able to be merged with any feature extractor depending on the application. Pre-processing of data is very important to models for accurate performance. Many infections (viral or fungal) can be hard to distinguish often sharing overlap of symptoms.

II. TECHNOLOGY INVOLVED

A. Front end used- PYTHON

PYTHON

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built-in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy-to-learn syntax emphasizes readability and therefore reduces the cost of program maintenance. Python supports modules and packages, which encourages program modularity and code reuse. The Python interpreter and the extensive standard library are available in source or binary form without charge for all major platforms, and can be freely distributed.

Python Features

Python has few keywords, simple structure, and a clearly defined syntax. Python code is more clearly defined and visible to the eyes. Python's source code is fairly easy-to-maintain. Python's bulk of the library is very portable and cross-platform compatible on UNIX, Windows, and Macintosh. Python has support for an interactive mode which allows interactive testing and debugging of snippets of code.

GUI Programming

Python supports GUI applications that can be created and ported to many system calls, libraries and windows systems, such as Windows MFC, Macintosh, and the X Window system of Unix.

Platform

Machine Learning

Machine Learning is an application of artificial intelligence (AI) that provides system the ability to automatically learn and improve from experience without being explicitly programmed. Machine learning focuses on the development of computer programs that can access data and use it learn for themselves.

HYPER TEXT MARKUP LANGUAGE (HTML)

HTML is an application of the Standard Generalized Markup Language (SGML), which was approved as an international standard in the year 1986. SGML provides a way to encode hyper documents so they can be interchanged.

SGML is also a Meta language for formally describing document markup system. In fact, HTML uses SGML to define a language that describes a WWW hyper document's structure and inter connectivity.

Following the rigors of SGML, TBL bore HTML to the world in 1990. Since then, many of us have it to be easy to use but sometimes quite limiting. These limiting factors are being addressed but the World Wide Web Consortium (aka W3c) at MIT. But HTML had to start somewhere, and its success argues that it didn't start out too badly.

WHY MACHINE LEARNING?

- It was born from pattern recognition and theory that computers can learn without being programmed to specific tasks.
- It is a method of Data analysis that automates analytical model building.

Machine learning tasks are typically classified into two broad categories, depending on whether there is a learning " signal" or" feedback" available to a learning system: Supervised learning The computer is presented with example inputs and their desired outputs, given by a " teacher", and the goal is to learn a general rule that maps inputs to outputs. As special cases, the input signal can be only partially available, or restricted to special feedback: Semi-supervised learning The computer is given

only an incomplete training signal: a training set with some (often many) of the target outputs missing.

B. *Back end ued- POSTGRESQL*

Database

A database is simply a collection of user data just like phone book. PostgreSQL database include such objects as tables, queries, forms, and more.

Tables

In PostgreSQL tables are collection of similar data. With all tables can be organized differently, and contain mostly different information- but they should all be in the same database file. For instance, we may have a database file called video store. Containing tables named members, tapes, reservations and so on. These tables are stored in the same database file because they are often used together to create reports to help to fill out on screen forms.

Relational database

PostgreSQL is a relational database. Relational databases tools like access can help us manage information in three important ways.

- Reduce redundancy
- Facilitate the sharing of information
- Keep data accurate.

Fields are place in a table where we store individual chunks of information.

Primary key and other indexed fields

PostgreSQL use key fields and indexing to help speed many database operations. We can tell PostgreSQL, which should be key fields, or PostgreSQL can assign them automatically.

Controls and objects

Queries are access objects us display, print and use our data. They can be things like field labels that we drag around when designing reports. Or they can be pictures, or titles for reports, or boxes containing the results of calculations.

Queries and dynasts

Queries are request to information. When access responds with its list of data, that response constitutes a dynaset. A dynamic set of data meeting our query criteria. Because of the way access is designed, dynasts are updated even after we have made our query.

Forms

Forms are on screen arrangement that make it easy to enter and read data. we can also print the forms if we want to. We can design form our self, or let the access auto form feature.

Reports

Reports are paper copies of dynaset. We can also print reports to disk, if we like. Access helps us to create the reports. There are even wizards for complex printouts.

Properties

Properties are the specification we assigned to parts of our database design. We can define properties for fields, forms, controls and most other access objects.

III. SYSTEM ANALYSIS

EXISTING SYSTEM

The existing method for crop disease detection is simply naked eye observation by experts through which identification and detection of plant diseases is done. For doing so, a large team of experts as well as continuous monitoring of plant is required, which costs very high when we do with large farms. At the same time, in some countries, farmers do not have proper facilities or even idea that they can contact to experts. Due to which consulting experts even cost high as well as time consuming too. In such conditions, the suggested technique proves to be beneficial in monitoring large fields of crops.

Automatic detection of the diseases by just seeing the symptoms on the plant leaves makes it easier as well as cheaper. This also supports machine vision to provide image based automatic process control, inspection, and robot guidance. Plants are considered as energy supply to mankind. Plant diseases can affect the agriculture which can be resulted in to huge loss on the crop yield.

DIS-ADVANTAGES OF EXISTING SYSTEM

- No specified techniques to detect the disease but only man can predict.
- Process should be very slow.
- Time and Space consume also very high cost to identify the disaster.

PROPOSED SYSTEM

This research work is based on the crop disease detection. The crop disease detection technique is based on the segmentation, feature extraction and classification. Digital camera or similar devices are use to take images of leafs of different types, and then those are used to identify the affected area in leafs. Here in the proposed system to detect the crop disease, Convolution neural network and Deep neural network is specified. This paper proposes a system which uses the low cost and open source software for achieving the goal of detecting the plant disease accurately.

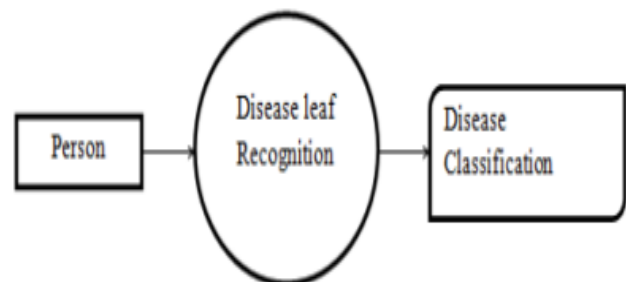
IV. DATAFLOW DIAGRAM

Data flow is the graphical representation of the “FLOW” of data through an information system. It differs from the dataflow as it shows the data flow instead of the control flow of the program.

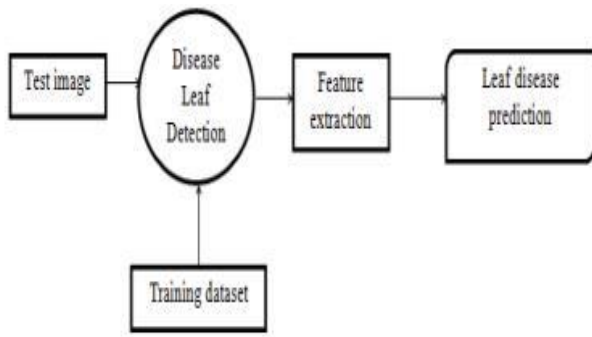
A two-dimensional diagram explains how data is processed and transferred in a system. The graphical depiction identifies each source of data and how it interacts with other data sources to reach a common output.

Individuals seeking to draft a data flow diagram must identify external inputs and outputs, determine how the inputs and outputs relate to each other, and explain with graphics how these connections relate and what they result in.

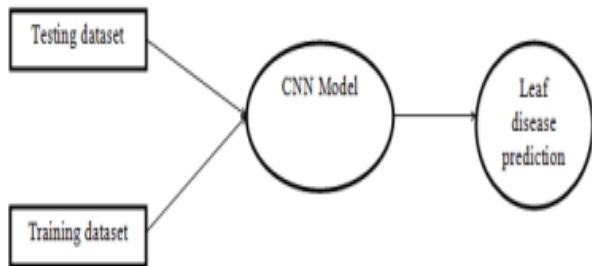
LEVEL 0



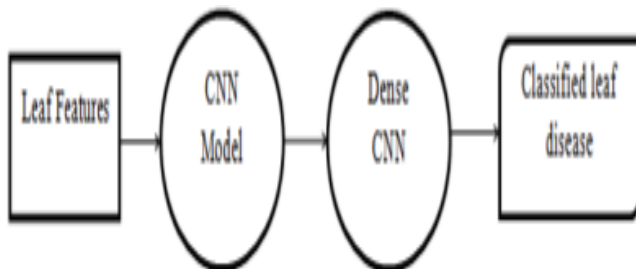
LEVEL 1



LEVEL 2



LEVEL 3



V. SCOPE

In future, the proposed system would be deployed and tested in real field. The camera will be used to capture different regions in a farm from which the leaves of the plants will be separated to segment the diseased area. History about the entire region with the specific crop based details can be collected and maintained for further reference. User friendly app could be developed to alert the farmers and provide them with solutions in real time.

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