

Agricultural Performance Enhancement by Identifying Suitability of Soil for Specific Type Crop Using Image Processing

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Abstract : *Agricultural is one of the most important sector within the Indian economy. Over seventy percent of the agricultural households depends upon agriculture. Many farmers do not test their soil because they think it as a waste of time and money. Very few farmers rely on soil testing, done by governments labs which is not available near them. Many farmers don't have any knowledge about which is our soil color, which crop should be planted and which fertilizers could be beneficial for soil. The image processing is most recent technology for soil determination. We use digital image processing with computer-based algorithm techniques for performing image processing or digital photography. Our project aims to reduce farmer time and money and find them an easy way to testing their soil and let them know about their soil color and crop through this image processing.*

I. INTRODUCTION

India is know as one of the famous agriculture country. Farmers have high range of variety of crops so farmers can decide the crops which can grows more in their soil. This can be done when we know the properties as well structure of the soil.

Most of the farmers do not perform soil testing because existing method consume time and money. Very few farmers rely on soil testing done by government labs which is not available near them Soil image processing is way to know quantity of fertilizer to meet the necessity of the crop by taking advantage of the nutrients already present in the soil. It will also help to know the soil problems to overcome. The soil plays an important role in analysis. The important of soil testing plays an important role in the farmer's life. Just because of lack of available resources as well as time and money consuming , many farmers doesn't take advantage of the soil image processing.

II. PROPOSED SYSTEM

The proposed system is a desktop based application. Which can be used for finding color and texture of soil sample. The main project work is of soil testing. We are trying to implement it with database application. It is very useful for the farmers as well as for government laboratories.

The main Project work are as follows :

- 1) To identify types of soil.
- 2) To determine the required crop for soil.
- 3) To determine the properties of soil.
- 4) To determine which fertilizer would be useful for your type of soil
- 5) To make the soil testing simple and easy for farmers.

As per the requirement of the system we want to make software which process and give some intermediate results. So people who want to test their soil can easily test it by using software. Digital image processing is a term in which digital images will be taken and calculates some values from it to perform particular operation on it. As many algorithms are used to perform mathematical as well as scientific operation on digital image processing we can implement our system based on need.

III.ALGORITHM

At first we are going to add an option of uploading image then after you clicking on that button you'll have to select one picture of soil that you want to scan. Then after finishing upload process will continue directly towards scanning and then scanner will scan and rectify the texture and colour of soil. After detecting soil colour and shape that information which system got will directly get compared with database we have and after matching it's texture and colour it will check through another database and then that database will provide you required fertilizers for soil that you have in your photograph and here you'll get your type of soil and which fertilizers should be beneficial for your soil. We are using JUPYTER as a project designing tool.

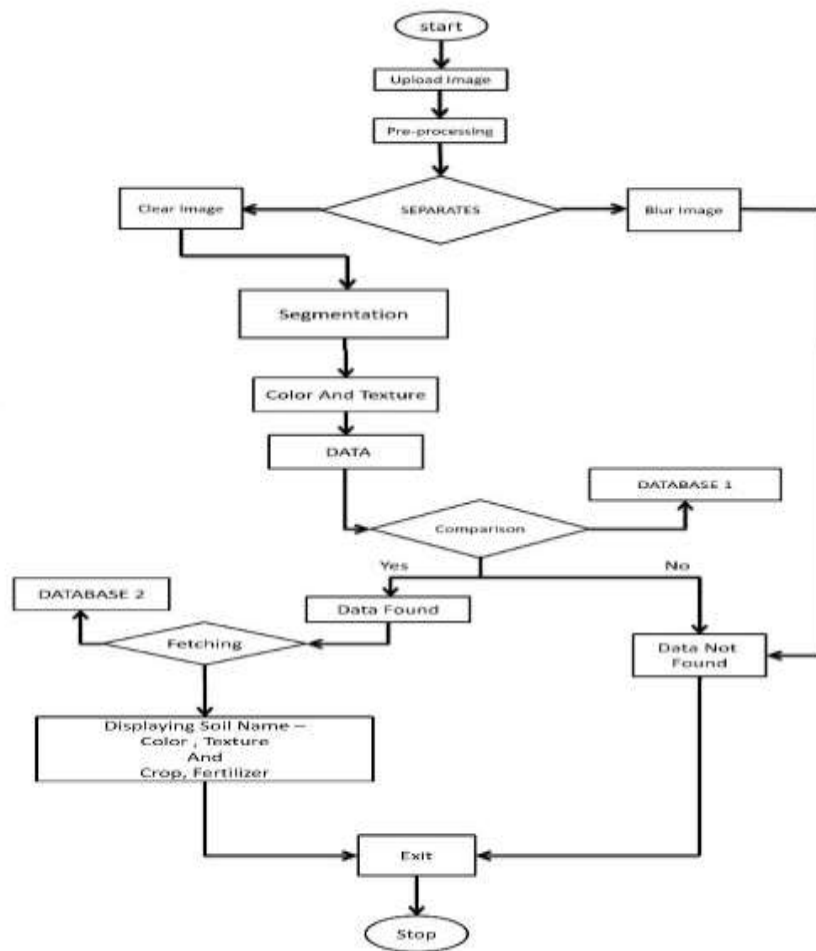


Figure:1.1

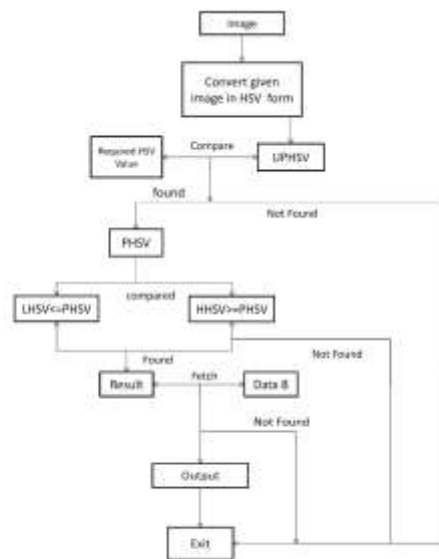


Figure:1.2

IV.RESULT

Our project is mainly based on soil related problem and the working is quite easy. So our project is going to detect the type of soil and after detection we will be able to explain you that which kind of fertilizer does your soil required. While if you want to design this type of program you'll require very less amount to build this project and however we are building it in simplified way so all you need is a good system to work on. Our project can determine type of soil and fertilizers which are going to be beneficial for your type of soil. Scanning system which we are designing that's going to scan soils colour and it's shape and by determining those we are going to identify the type of soil.



Figure:2.1 UI for initial working

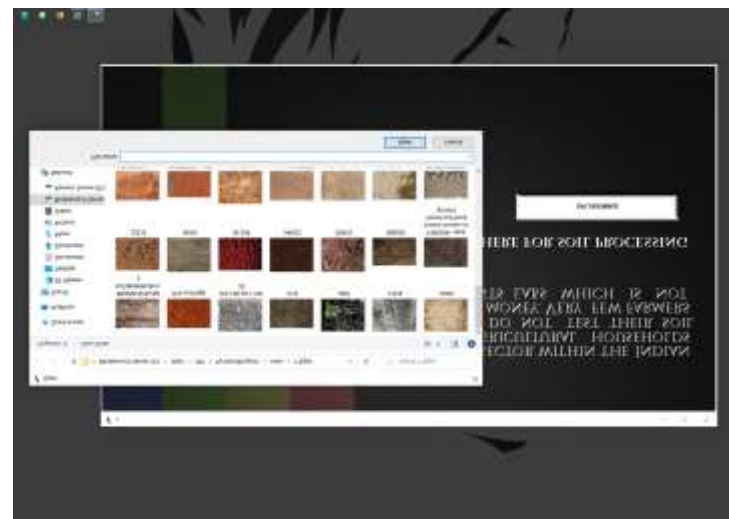


Figure:2.2 process of uploading image



Figure:2.3 processing on given image

Figure:2.4. Final Result (Output1)



Figure:2.5 Result {final output2}

V.CONCLUSION

This project based on digital image processing techniques by use of python language. We collect the digital photograph of soil sample where we use image processing for detecting soil photographs where we detect soil color their texture and because soil have different layers each layer has different texture, color, depth and composition. This layer of detection known as image processing.

We are applying algorithm for detecting and showing result respectively., we focus on various methods of soil acquisition and classification.. The advantage of this application is to find out which crop is suitable for certain soils that help increase agricultural productivity. This program depends on computerized picture preparing strategy in remote areas.

VI. ACKNOWLEDGMENT

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REFERENCES

- [1] Shima Ramesh maniyath “*Soil colour detection using knn classifier*” IEEE/research gate (2018).
- [2] International journals “*Testing of agricultural soil by digital image processing*” IEEE research gate (2017).
- [3] Ganesh Babu Rajendran, Chellaswamy Chellaiah “*Soil Test Based Smart Agriculture Management System*” IEEE 7th International Conference on Smart Structures and Systems, research gate (2020)
- [4] Kshirsagar, Lendave, Dr.Vibhute ”*Soil Nutrients Analysis using Colour Image Processing*” IRJET, research gate (2018)
- [5] Ganesh Babu Rajendran, Chellaswami Challaiah “*Soil Test Based Smart Agriculture Management System*”IEEE 7th International Conference on Smart Structures and Systems ICSSS 2020. Research Gate 2020
- [6] Gheoghe C, Diac T.A , Filip N “*Image Processing Techniques Used in Soil Moisture Analysis*” Technical University of Cluj - Napoca, Faculty of Automotive, Mechatronics and Mechanics / Romania. Research Gate 2019
- [7] Salih Aydemir “*Quantification of soil features using digital image processing (DIP) Techniques*” Harran University, Faculty of Agriculture, Department of Soil Science, 63043 Sanliurfa, Turkey. Research Gate 2019
- [8] Małgorzata Charytanowicz “*An Image Analysis Algorithm for Soil Structure Identifification*” Polish Academy of Sciences, Systems Research Institute, Centre of Information Technology for Data Analysis Methods, Newelska 6, 01-447 Warsaw, Poland. Research Gate 2018.
- [8] Shima Ramesh Maniyath “*Soil Color Detection Using Knn Classifier*” MVJ College of Engineering. Research Gate 2018.

