

Classification of Soil and Prediction of Crop

Shivakumar K. Honawad, Santosh S.Chinchalli



Abstract: Agriculture is a major backbone for most families. As we move from one location to other the soil is different. The yield from crop is not as much as accepted. The soil classification and crop prediction is done manually, so research in this field is at most importance. The Digitization technique has employed in this paper to overcome the manual task. Hence SCP algorithm has been implemented. The algorithm classifies images and provide suitable crop for classified soil. So this work can be used in agriculture field.

Keywords : Crops, Digital technique, Soil types, Soil images.

I. INTRODUCTION

The Irrigation method has not been a traditional method nowadays. As the climate changes occurring, the Process of growing crops is also changing. The Soil has been playing a major role in the agriculture. As we go through different places on the earth, we always find different kind of a soil. The appearance of a soil and color is not similar at all. There is a need for automation in agriculture. As the technology is emerging day by day, we have to follow the advanced approach rather than a traditional. The following of Traditional approach always consume time and more human involvement. Hence we are going for advanced approach, where there is no involvement of manpower and consume less time.

The Digitization of Image has been employed. In this paper Digitization technique has been involved. Using the DSLR camera the pictures of the Soil are taken, we collect sample pictures of different types of soils. All the pictures are stored in a database. The different soils pictures are taken, because the region wise soils are different. The Classification of soils are done based on collected samples. The color of a soil plays a major role. Similarly the appearance is also considered. Once we create the database consists of different pictures of soils, then we employ our digitization process. We take image of soil compare it with the created database to find the matching image. Evaporation of water in a soil is considered most important. Water moves more freely through sandy soils than it does through clay soils. The Measurement of appearance features is considered in many digitization techniques.

Five different feature extraction techniques has been evaluated [1]. Color of a soil and appearance a soil are the most important features in digitization techniques. In this paper different preprocessing methods have been employed. The classification rate improvement has also been seen [2].The prediction of crop is not done generally, it is very difficult process. The issue is overcome in this paper by finding soil and suitable crop to get high yield.

II. PROBLEM DEFINITION

Using the present scenario the soil classification has been done by physical examination and based on the soil the crop which is suitable for growth has been suggested. But it is time consuming and prone to human errors.

III. PROPOSED METHODOLOGY

The soil type is classified using color, texture, boundary features. The Proposed fig 1 Dataflow diagram is used to classify the soil. The designed technique deals with working on different pictures of different soil types, finding different features of soil images and then creating a database to store classified images.The SCP algorithm has been used.

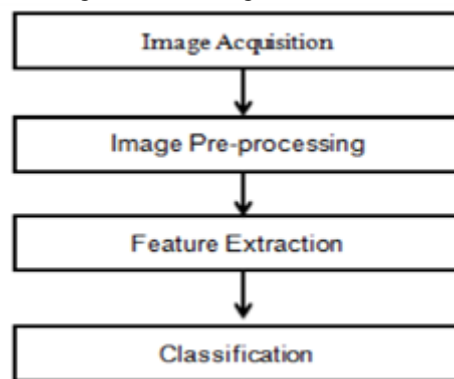


Fig 1. Dataflow

As seen in fig 1 after classification we perform testing image with database to find matching image. Based on matching soil image we specify which is suitable.

IV. IMPLEMENTATION

The following SCP algorithm has been used

1. Collect the data set of different soil images
2. From images extract the features such as color and texture
An extracted image has been applied with Gabor Filter then Classify
3. Database of soil types of different images has been Developed
4. Read a test image extract features compare with the Database
5. Different Matching Soil Images are Encountered

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* Correspondence Author

Shivakumar K. Honawad*, Department of Information Science and Engineering, V.P.DR P.G.Halakatti College of Engineering and Technology Vijayapura, India. Email: shivakumar.honawad@gmail.com

Santosh S.Chinchalli Department of Information Science and Engineering, V.P.DR P.G.Halakatti College of Engineering and Technology Vijayapura, India. Email: santosh.chinchalli@gmail.com

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7. Applying Statistical Measure on Each Images, the Image having highest matching ratio will be Matching Image.
8. The matching image we use to specify suitable crop for the Soil The above SCP algorithm has been implemented by collecting images and providing results with most accuracy .

V.RESULTS AND DISCUSSION

The Fig 2 shows image of clay soil, when quantization applied result shown in fig 3.the filtering approach is applied shown in figure 4 for law mask and fig 5 for Gabor. The fig .6 shows image of alluvial soil, when quantization applied result shown in fig 7.the filtering approach is applied shown in figure 8 for law mask and fig 9 for Gabor.



Fig2. image of clay soil



Fig 3. Quantization image of clay soil

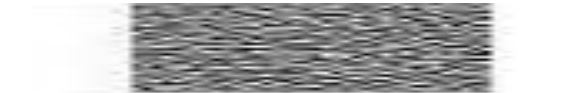


Fig 4 law mask filter image of clay soil



Fig 5 Gabor filter image of clay soil



Fig 6 image of alluvial soil



Fig 7 Quantization image of alluvial soil



Fig 8 law mask filter image of alluvial soil



Fig 9 Gabor filter image of alluvial soil

The fig 10 shows the test image for finding the matching image.



Fig 10 Test image

The fig 11 shows different matching images for a test image.

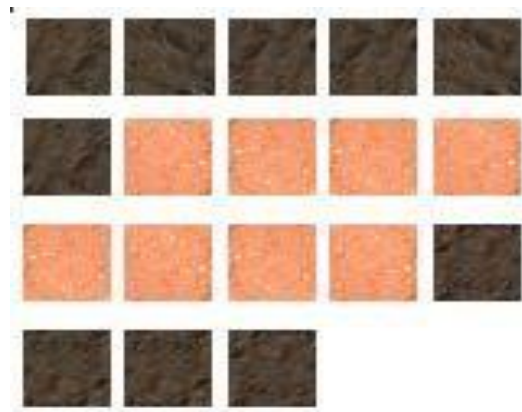


Fig 11 Matching images from database

The different statistical measures have been applied on each images retrieved, the image having highest matching ratio is Matching image shown in fig 12.



Fig12 Matched Image

The matched image is specified with crop suitable for it grow to give highest yield.

Table 1 Accuracy

Soil Type	Accuracy of soil	Matching Crop	Accuracy of Prediction
Clay	95.16%	Potato	93.07%
Alluvial	94.51%	Wheat	92.69%

The Table 1 shows the result of clay and alluvial soil accuracy in classification .Also suitable crop prediction accuracy for the soils has been shown.

VI. CONCLUSION

The SCP algorithm solves the problem of manual classification and prediction. So soil classified accurately and suitable crop is predicted for the classified soil. This paper solves the agriculture issue of manual task of getting low yield.

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AUTHORS PROFILE



Shivakumar.K.Honawad B.E(ISE),M.TECH(CSE), Assistant Professor.Department of Information Science and Engineering, V.P.DR P.G.Halakatti College of Engineering and TechnologyVijayapuraIndia. Automata theory and file structures are most interested Subjects with 10 years of teaching experience, Research areas image processing, cloud computing



Santosh S.Chinchalli B.E(CSE),M.TECH(CSE), Assistant Professor Department of Information Science and Engineering, V.P.DR P.G.Halakatti College of Engineering and TechnologyVijayapura India. Web technology and computer networks are most Interested subjects with 10 years of teaching experience, Research areas image processing, computer Networks