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Survey on Soil Water Level Prediction

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ABSTRACT: Agriculture is the primary source of livelihood for about 58 per cent of India's population and is the most crucial part of GDP. Indian farming is based on economic benefits from crop yields, but now day's agricultural era has failed to proven best crop selection methods and to increase crop yield in all over India. So decrease in crop yield increases problem in farmer's financial health conditions. So it becomes most trending problem for our agricultural field to invent such noble method to recommend best suitable crop for a particular region. To achieve best suitable crop selection for regions based on parameters like soil conditions, rainfall and weather we have implemented machine learning approach. Secondary problem is lack of knowledge or absence of guidance while farming. Lack of guidance in Indian farmers may follow wrong farming techniques or inefficient traditional methods. Most of farmers are uneducated and non-technical backgrounds so they are rely on traditional crop selection and farming methods which falls them into economical loss. With the help of disease analysis system we predict the crop disease prediction and suggest the precaution from those diseases. Last and most important problem is no proper market analysis while cultivation of any particular crop. Which may also leads to economical loss of farmers.

I. INTRODUCTION

Indian farming is based on economic benefits from crop yields, but now day's agricultural era has failed to proven best crop selection methods and to increase crop yield in all over India. So decrease in crop yield increases problem in farmer's financial health conditions. So it becomes most trending problem for our agricultural field to invent such noble method to recommend best suitable crop and need of online market place.Crop recommendation is completely based on environmental factors like soil, weather and rainfall for particular region. So there is need of machine learning techniques like support vector machine and Convolutional neural network for classification and clustering dataset. We recommend best suitable crop for particular region based on this regional parametric environmental information. Our contribution solves crop selection problem and ultimately increase the rate of yields and helps to improve economic health of our farmers. As well as we are going to provide guidance by technical methods from cultivation to yields by helping out dynamic queries of farmers while farming. We are going to provide E-mart for online selling of farmer's product which will help to farmers to get more economical benefits than existing market rate.

Data mining implies distinguishing concealed examples from enormous datasets and setting up a relationship among them to take care of the issue through information investigation. Presentation of information mining in agriculture field has made advantages in research field. Characterization is vital in any field of science to set up the essentials. It can help finding the variety between the items and ideas. It likewise gives essential data through which exploration can be made in a methodical way. Soil is one of the vital parts in farming field for yielding harvests. Soil arrangement ways of thinking follow the presence information and commonsenseconditions. On the land surfaces of earth, grouping of soil makes a connection between soil tests and different sorts of characteristic substance. Soil classification has evolved as a very popular problem in Image processing and Computer Vision. Many new algorithms are being devised using convolutional architectures to make the algorithm as accurate as possible. These convolutional architectures have made it possible to extract even the pixel details, this research aim to design a binary face classifier which can extract the features like edges, color, and texture irrespective of its alignment. This research presents a method to generate accurate

soil classification from any arbitrary size input image. Soil images are recognized by LSTM methods using various chemical features and possible crops for that soil series are suggested using geographical attributes using LSTM.

II. LITERATURE SURVEY

Sr.No	Paper Name	Paper Concept	Advantage	Disadvantage
1	ShanningBao, S. Cao, C., Ni, X., Xu, M., Ju, H., He, Q., & Zhou, S **Crop Yield Variation Trend And Distribution Pattern In Recent Ten Years.** 2017 IEEE	The purpose of this paper is to a two-band variant of the enhanced vegetation index at mature date was applied to establish empirical yield estimation model, coupling with statistical crop yield data in china.	This system give suggestion for agriculture planning and management	The majority result could not reflect the spatial variation of crop yield accurately
2	Kulkarni, S., Mandal, S. N., Sharma, G. S., Mundada, M. R., &Meeradevi **"Predictive Analysis to Improve Crop Yield using a Neural Network Model"** 2018 IEEE	In this system proposed a data-driven model that learns by historic soil as well as rainfall data to analyse and predict crop yield over seasons in several districts, has been developed	The final predictions obtained were successful in depicting the interdependence between soil parameters for yield and weather attributes.	In existing system Wireless Sensor Networks at real-time to collect and transform data directly to predictive models are very costly.
3	Michael Johnson, M. D., Hsieh, W. W., Cannon, A. J., A., &Bédard, F. **Crop yield forecasting on the Canadian Prairies by remotely sensed vegetation indices and machine learning methods. Agricultural and Forest Meteorology** IEEE 2016	In this System, study focused on the prediction of barley, canola and spring wheat using remotely sensed vegetation indices and compared the effectiveness of MODIS-NDVI, MODIS-EVI and AVHRR-NDVI	Develop crop yield forecast models for the Canadian Prairies	Many current crop forecasting methods use only linear techniques are used which could miss nonlinear relationships in the data.
4	Pantazi, X. E., Moshou, D., Alexandridis, T., Whetton, R.	In a proposed new technique based on multiple	The proposed MMCA framework can lead to very good classification	In the existing system work on only limited

	L., &Mouazen, A. M. **Wheat yield prediction using machine learning and advanced sensing techniques. Computers and Electronics in Agriculture** IEEE 2016	morphological component analysis (MMCA) that exploits multiple textural features for decomposition of remote sensing images.	performances in different analysis scenarios.	training samples.
5	Xiang Xu, X., Li, J., Huang, X., Dalla Mura, M., & Plaza, A. **Multiple Morphological Component Analysis Based Decomposition for Remote Sensing Image Classification. IEEE Transactions on Geoscience and Remote Sensing** 2016	In this system, presented a novel approach for trip planning in highly congested urban areas.	1. To computes intelligent routes that avoid traffic hazards in advance. 2. The proposed trip planner consists of a continuous traffic model based on real-time sensor readings and a web based user interface.	Data in our model is possible by dynamically changing the traffic network i.e. in case of road blockages and in case of a accident.

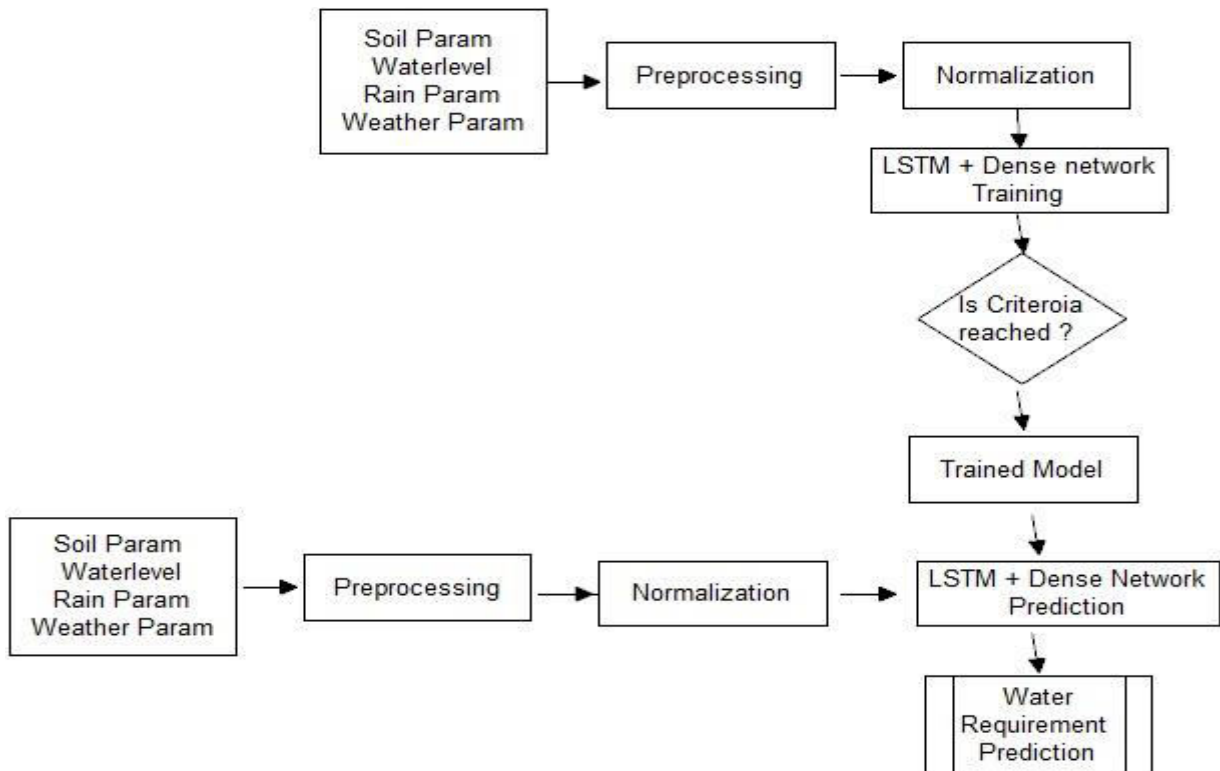## III.PROPOSED SYSTEM APPROACH

Fig.System Architecture

The image classification using convolutional neural network, a sufficient no. of training samples is required. The training samples are collected from fieldwork. The conditions considered while selecting training samples included spatial resolution of the collected images, availability of ground reference data, and complexity of the data being considered. After successful image classification the crops will be recommended by using Support vector machine (SVM). In that we are contributing one more facility to the farmer, he will sell his product online also without going into market into this pandemic period. The method involves two phases: training phase and testing phase. Two datasets are used: Soil dataset and crop dataset. Soil dataset contains images of every class such as alluvial soil, Black Soil, Clay Soil, Red Soil. Crop dataset is used for the recommending the crops based on that soil class.

IV. METHODOLOGY USED IN PROPOSED SYSTEM:

LSTM

Long Short Term Memory networks usually just called LSTMs are a special kind of RNN, capable of learning long-term dependencies. and were refined and popularized by many people in following work.
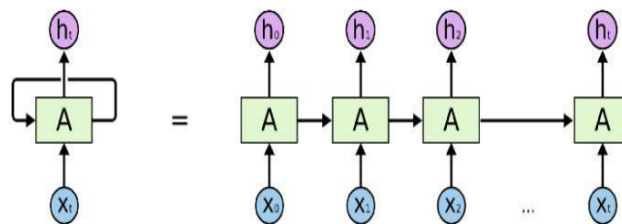

Figure Architecture of LSTM

They work tremendously well on a large variety of sequence modelling problems, and are now widely used. LSTMs are explicitly designed to avoid the long-term dependency problem. Remembering information for long periods of time is their default behavior. Let's recall how an RNN looks As we saw in the RNN article the RNN unit takes the current input (X) as well as the previous input (A) to produce output (H) and current state (A).
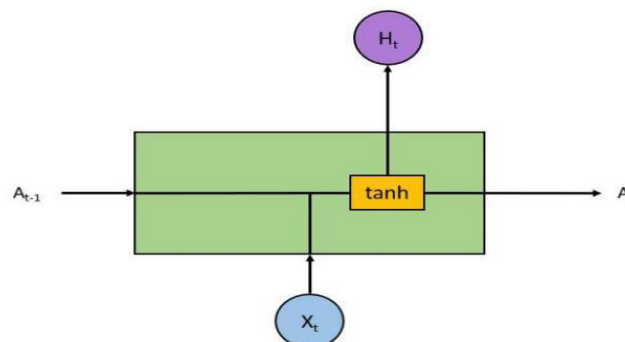

Figure Architecture of One Block

LSTMs also have a similar structure though the internals have different components as compared to a single tanh (activation) layer in the RNN. There are 4 layers inside an LSTM block which interact together:
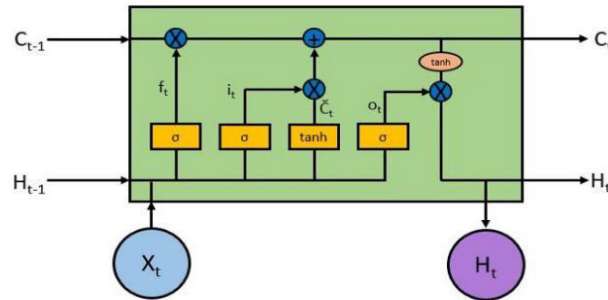

Figure. Layers of LSTM

At first it looks pretty complicated and intimidating but let's tries to break it down and understand what the purpose of each layer and block is. The key to the operation of LSTM is the top horizontal line running from left to right enclosed in the highlight below. With some minor linear interactions along this line the cell state C allows information to flow through the entire LSTM unchanged which enables LSTM to remember context several time steps in the past. Into this line there are several inputs and outputs which allow us to add or remove information to the cell state. The addition or removal of information is controlled by gates. These are the sigmoid layers (Yellow boxes inside the RNN cell). They output numbers between zero and one, describing how much of each component should be let through. A value of zero means let nothing through, while a value of one means let everything through. An LSTM has three of these gates to control the cell state.

V.CONCLUSION

In a proposed system we invent effective crop choice technique primarily based on Machine learning approach. We suggest the great suitable crop selection technique for the local environmental situations. We are going to evaluation diseases of plants at runtime for higher yield cultivation additionally enables for farmer in crop disease prediction system. Hence it's miles a significant contribution closer to the economic and agricultural welfare of the international locations the world over. In future work we are going to consciousness on greater detailed observe and developed android apps for e-commerce of product.

VI. ACKNOWLEDGMENT

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