Smart Farming using Seed Prediction Based on Available Datasets

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Abstract

Everyone nowadays focus mainly on the growth of the plant and the main thing has been ignored, which is the selection of seed.Selection of good seeds from different varieties of available seeds is a tedious task and the selection depends upon various factors such as soil type, yield, diseases etc. Every seed also have its own properties, which affects the growth of the plant in various terrain. So in this paper, the structure of Linguistic Fuzzy Decision Network (LFDN) method is used to determine best quality of seeds. As when the decision are needed to be made depending upon more than one factor, then decision making become very tedious. So to handle this situation, we have undergone through many algorithm and Linguistic Fuzzy Decision Network had been the best.

Keywords: *Analytic hierarchy process, Case based reasoning, Data envelopment analysis, Fuzzy cognitive map, Fuzzy design map, Goal programming, Multiple criteria decision analysis*

INTRODUCTION

Decision Makers (DM) is used to decide the correct alternative from a set of available alternatives to satisfy their goals. If we are dealing with real world problem, then we can find out that decision processes is a complex problem. The selection problem will become very hard because of complex, interconnected or even sometimes due to conflicting objectives [1, 2]. The main contribution of this paper can be summarized as follows: Fuzzy design map can help us to find the decision making in such a way that it leads to determine the set of alternatives, evaluating those alternatives and finally comparison between the evaluated alternatives is done. Fuzzy cognitive map are likewise utilized as it bolster causal learning thinking procedure and have a place with the Neuro-fluffy framework that go for taking care of basic leadership issues, displaying and recreate complex frameworks. Learning calculation have been proposed for preparing and refreshing FCM which depends on the thought originating from counterfeit neural system plan.

In this paper, we have collected data about the yield of crop depending on the different types of seed used by the farmers from various sources like government agricultural department, and from the farmer itself. By analysing it and applying various algorithm, we are providing the best seed which the farmer can use for their crop in agriculture and he can maximize his yield and can earn a good profit.

SYSTEM ARCHITECTURE

Representative data collection and it's analysis to get the final seed has the following modules:

Data Collection: Data about the yield of the crop can be collected directly from the farmers. The same can be collected from various agricultural departments about the yield of crops [3].

Selection of Attribute: Then from the available sorted data, the data can be further sorted on the basis of different available attributes like soil quality, soil type and previous year yield. The selection of attribute depends completely on the need of farmers [4].

Prediction: Here comes the important part which is predicting the seed which is going to be the best for the farmers. Here we are going to use many different machine learning algorithm like fuzzy logic which can use many factor under consideration to get the finally sorted list of the seed. And cross-validation for the optimization of the result[5].

Selection of Seed: So from the available seed type of same crop. The best suited seed depending upon the area where the seed are to be sown, Amount of water available in the area, Amount of yield in various previous year are considered before the final selection of seed. Then all the needed things like type of fertilizers to be used for proper growth, amount of irrigation needed for that crop, time of irrigation, maturation period and market price is also made available to the farmer depending upon the selected seed.

PROPOSED SYSTEM AND RELATED WORK

In the proposed model, mainly the focus is on the selection of crop and not on the seed. Selecting the best wheat variety seed from many different types of varieties for cultivating in specified field is a complex process that faces the Decision Makers (e.g. farmers, their advisors, and stakeholders). Right choice in the choice of the best wheat assortment to be developed will at last believer into an effective cultivating plan. Then again, choosing the appropriate assortment for season among the numerous options is a multi-criteria basic leadership issue. In this paper, the structure of Linguistic Fuzzy Decision Network (LFDN) technique is improved to be connected for a situation consider from genuine world to decide the best wheat assortment among four assortments specifically: Sakha 94, Gemmeiza 10, Giza 86 and Sids 1 regarding to multiple criteria namely: soil salinity, soil type, yield and diseases [6].

In our planMCDA (Multiple Criteria Decision Analysis)

MCDM or MCDA are outstanding abbreviations for numerous criteria basic leadership and different criteria choice investigation.

It is worried about organizing and taking care of choice and arranging issues including different criteria.

Multiple-criteria evaluation problems: These problems consist of a finite number of alternatives, explicitly known in the beginning of the solution process.

Multiple-criteria design problems (multiple objective mathematical programming problems): In these issues, the choices are not unequivocally known. An option (arrangement) can be found by comprehending a scientific model. The quantity of options is either vast or not countable.

The Basic Steps for Data Retrieval

Data Collection

Step 1: Fuzzification of info factors, characterizing the control goals and criteria

Step 2: Utilization of fluffy administrators (AND, OR, NOT) in the IF (forerunner) some portion of the standard. Decide the yield and information connections and pick a base number of factors for contribution to the fluffy rationale motor.

Step 3: Suggestion from forerunner to the resulting (THEN piece of the standard) for the ideal framework yield reaction for a given framework input conditions.

Step 4: Aggregation of the consequents across the rules by creating fuzzy logic membership functions that define the meaning (values) of input/output terms used in the rule.

Step 5: Defuzzification to obtain a crisp result.

Query Request

For retrieving some data from the outsourced database, the client will have to first generate a SQL query. After the plaintext query request is generated, it will be modified into an encrypted one as follows:

- Encrypt the section name: the cloud figures the segment name (Ti) with the symmetric key K.
- Encrypt the range esteem limit esteem: The range limit esteem is encoded In Pallier cryptosystem with the assistance of open key PK by the customer.
- Generate the token: The customer initially breaks down the solicitation and discovers what number of sections is included. The customer utilizes the private key SK to sign in the information. The comparing token sign(TNO||CN||N||T) is created identified with the sections associated with the question, where TNO is the token sequential number, CN is the absolute segments included, N is the all out things in the table and T is the timestamp.
- Send the query request: finally, the client send the query request to Cloud A with signed token, where the actual data is stored in the database
- SELECT * FROM table WHERE $E(T_i)$> A,

Item Selected

1. We are taking amount of yield and maturity period.
2. IF {High Yield and Low maturity} THEN {Best crop}.
3. IF {Moderate Yield and Low maturity} THEN {very good crop}
4. IF {Low Yield and Low maturity} THEN {Worst crop}.
5. IF {High Yield and Moderate maturity} THEN {Good crop}.
6. IF {Moderate Yield and Moderate maturity} THEN {Average crop}.
7. IF {Low Yield and Moderate maturity} THEN {Bad crop}.
8. Then represent it pictorially using graph.

Query Response

By this, we are making our farmers digital and aware about the seed of crop to be used.

We are providing them most precise seed for their crop and information related to the crop which is needed for the proper growth of crop. Government can use this reliable error free data to know the current status of our farmers from arid regions in small time.Flexibility of system is allowing addition of more attribute and type of seed [7-9].

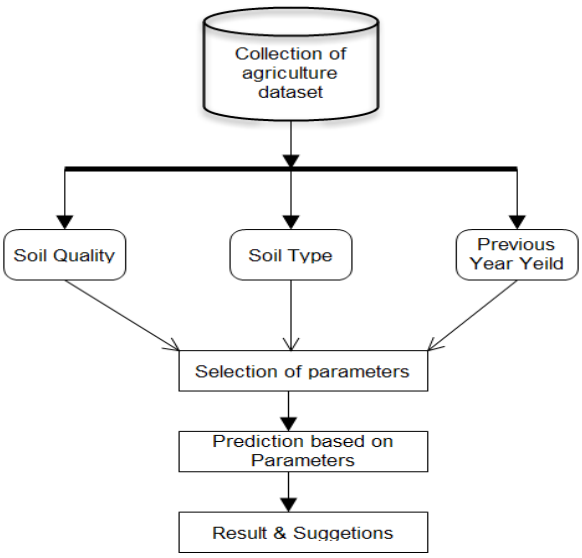

Figure 1: *Proposed System.*

CONCLUSION

In this report, we are making our farmers digital and aware about the seed to be used. We are providing them the most precise weather conditions and information about related government policies. Further, government can use this reliable and error free data to know the current status of our farmers from arid regions in a small time. With the help of this technique, every farmer is aware about the best seed that need to be cultivated according to their agriculture farm. Flexibility of system is allowing addition of more sensor and modification.

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