

AN APPROACH TO EVALUATE GOOD WEATHER USING FUZZY SET THEORY

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ABSTRACT

In day to day life weather condition is an essential issue for a common man. So it is important to know what the good weather is. But good weather evaluation is a critical issue as the parameters used for this purpose are vague and imprecise. So in this paper I propose a technique to evaluate good weather based on fuzzy set theory.

Keywords: Fuzzy set theory, Environment, weather, good weather evaluation.

1. INTRODUCTION

Among various paradigmatic changes in science and mathematics in this century one of such changes concern the concepts of fuzzy set theory. This concepts was first develops by Prof. Lofti Zadeh, U.C. Berkeley in 1965 [1]. The basic logic behind the concepts is that every element in the set has some membership grade which is given by some function associated with that element called membership function.

It is well known that. “MORNING SHOWS THE DAY” preserving this people want to know how the morning is. For that whole the morning in everyday life depends on the weather. So it is most important to a common people’s life the weather is well behave. There are some professional people in the world who always want to a good weather in there area so that they entertained. But the “GOOD WEATHER” a vague concept. As good weather evaluation is a critical issue. The parameters used for this purpose are vague and imprecise. Lotfi A. Zadeh in 1965 developed fuzzy set theory which solves the problems tainted with vague, imprecise and incomplete data and provides better and accurate results.

In this paper we proposed a theory based on expert view and give each area’s weather a grade point which can easily tell a general person a particular area’s weather is good or bad.

2. SOME DEFINITION

Fuzzy set: Let X be a universal set. Then fuzzy subset A of X is define by its membership function $\mu_A: X \rightarrow [0, 1]$

Which assign a real number $\mu_A(x)$ in the interval $[0, 1]$, to each element $x \in X$, where the value of each $\mu_A(x)$ at x shows the grade of membership of x in A . [3]

Characteristic function: Let A be any set then a function χ_A called Characteristic function which can take only two value either 1 when x belong to A or 0 when x not belong to A .
i.e.

$$\chi_A(x) = \begin{cases} 1, & \text{if } x \text{ in } A \\ 0, & \text{if } x \text{ not in } A \end{cases} \quad [4]$$

3. HOW TO CONSTRUCTS A MEMBERSHIP FUNCTION

The following is a scenario within which the construction of fuzzy set takes place. The scenario involves a specific knowledge domain of interest, one or more experts in this domain and a knowledge engineer. The role of the knowledge engineer is to elicit knowledge from the expert who are assumed to posses it and to express the knowledge in some operation form of a require type. In our case the knowledge is supposed to express in terms of proposition involving linguistic variables.

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Knowledge can be elicited only through interaction of the knowledge engineer with the experts. It should be done in two stage, are

- The knowledge engineer attempts to elicit knowledge in terms of proposition expressed in natural language.
- He or she attempts to determine the meaning of each linguistic term employed in these propositions.

It is during the second stage of knowledge acquisition that function representing fuzzy set and operation of fuzzy set are constructed [2].

4. METHODOLOGY

After observing the sky or any locality will anyone can tell that a particular area's weather is a good player or bad player? Obviously not, because How or for which basis or terminology that can make the weather good or bad that is a big question in any one's mind. But by using fuzzy set theory this kind problem remove easily. An approach has been devised here

Let us suppose G is any area (without loss of generality let us to take a country). Now first of all we may collect all the required knowledge of environment about G and observing carefully one by one all the situation that may involved in that particular area. After that we may summarize a brief table for the area G for n reason and mention all the possible case.

Secondly we have to choose some well known expert A_i ($i = 1, 2, 3, \dots, n$) and elicited knowledge through the interaction for that particular area's environment. But in that interaction lot of linguistic term may arise. Now we attempt to determine the meaning of each linguistic term which is involved for the environment o the area.

Now we have to ask them how or using which linguistic term an expert can take a particular area's environment take in good category.

Let us suppose there are A_i ($i = 1, 2, 3, \dots, n$) well know experts involved in our system and $x_1, x_2, x_3, x_4, \dots, x_n$ are the reason for which we may summaries a table.

By Expert A_1 :	G is GOOD ENVIRONMENT	using L_1 linguistic variable.
By Expert A_2 :	G is GOOD ENVIRONMENT	using L_2 linguistic variable.
By Expert A_3 :	G is GOOD ENVIRONMENT	using L_3 linguistic variable.
.....		
.....		
By Expert A_n :	G is GOOD ENVIRONMENT	using L_n linguistic variable.

Where,

- $G_i \in A_i(L_i)$ which mean that the expert A_i called G_i is good by using L_i linguistic term.
- $A_i(L_i)$ the expert A_i take L_i linguistic term to make his perception.

Now we can take

$$G_i = \begin{cases} 1, & \text{when } G_i \text{ belong to } A_i(L_i) \\ 0, & \text{when } G_i \text{ not belong to } A_i(L_i) \end{cases}$$

Now the grade point of X_i can is evaluate by the given formula

$$G_r \text{ pt } (X_i) = \begin{cases} \sum_{i=0}^n (X_i \in A_i(L_i)) \\ \alpha, & \text{where } 0 \leq \alpha \leq I \end{cases}$$

In this way we may give a particular player to a specific grade point. Let we have six area with grade point as given below....

$X_1 = 0.2$	$X_4 = 0.65$
$X_2 = 0.4$	$X_5 = 0.55$
$X_3 = 0.7$	$X_6 = 0.85$

From the table it is clear that X_3, X_4, X_6 are taken to be good. But it is very easy if we pair-wise compare. And also easy say if we take triplet or n -tauple a area is good.

5. CONCLUSION

In this paper we proposed an idea of using arithmetic mean to evaluate the grade point for each individual area with experts' point of view. The approach has been evaluated through taken an area's environment.

The advantage of this approaches are evaluation good area or environment or weather using simple arithmetic mean. A particular area's environment or weather plays important role in day to day life for a common people [5]. So it is very important to select a good area or good environment to reach the desired. This paper can help us to easily tell which particular environment or weather is suitable and select the required area make the effort to the required goals.

6. REFFERANCES

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