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Article

Neutrosophic Dynamic Set

A.A. Salama[1] , K.F.Alhasan[2], H. A. Elagamy[3], Florentin Smarandache[4]

[1] Dept. of Mathematics and Computer Science, Port Said University, Egypt. drsalama44@gmail.com
[2] Dept. of Mathematics, University of Babylon, Iraq; k.sultani@yahoo.com. pure.kawther.fa@uobabylon.edu.iq
[3] Dept. of Mathematics and Basic Sciences, Ministry of Higher Education, Higher Future Institute of Engineering and Technology in Mansour, Egypt; hatemelagamy@yahoo.com
[4] Dept. of Math and Sciences, University of New Mexico, Gallup, NM, USA; smarand@unm.edu

***** Correspondence: drsalama44@gmail.com

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Abstract: In this paper, we introduced the concept of the dynamic set according to modern logic, is neutrosophic logic. We study the neutrosophic dynamic set according to time and random variable depended on dynamic set. Neutrosophic dynamic is a dynamic analysis of a sequence of data through of time. It used in many problems in life such as a mathematical statistic, philosophy, medicine, engineering. Some examples and notes are presented.

Keywords: Neutrosophic Dynamic Set, Neutrosophic, Crisp Set, Dynamic Set

1. Introduction

Usually, the neutrosophic set used in available to us information has some indeterminacy [1] and for this, its extensions have become widely applied in almost areas, such as decision-making [6,4], clustering analysis[2], image processing [5], etc. However, in some complex problems in real- life, data may be collected from a different time that needs dynamic decision making for such situations. The term 'dynamic' can be is a series of decisions required to reach a target or the condition that dependent taking of decision and the state of problems. In this paper, we consider dynamic Neutrosophic according to time. The time of the employees 'arrival to their place of work, the follow-up of the students' arrival at their universities Patient care, and record the development of all health changes within a specified time.

Neutrosophic set [1]

The part function (indeterminacy function) that Smarandache (1999) added to intuitionistic fuzzy sets and it is called Neutrosophic Sets. This theory is a robust generalization of the classic set theory, fuzzy set theory by Zadeh, 1965, intuitionistic fuzzy set theory by Atanassov, 1986. Neutrosophic sets present a new part called "indeterminacy" differently from other fuzzy sets, and this part makes meaning more information than other approaches (Wen & Cheng, 2013).[9]

A neutrosophic set contains three parameters (parts), which are: truthiness (*T*), indeterminacy (*I*), and falsity (*F*). Truthiness and falsity correspond to membership (μ) and non-membership (μ^{-}) in intuitionistic fuzzy sets. Indeterminacy means that decision-makers assess for a decided indicating neutral idea [3].

Concepts of Neutrosophic sets

2. Neutrosophy set

Let A be a set in universal set U, represent A by $\mu_A(x)$, a truth membership function, $\mu_A(x)$: $X\rightarrow$] 0^{-}, 1^{+} [, $I_A(x)$, an indetermanced membership function, $I_A(x)$: $X\rightarrow$] 0^{-}, 1^{+} [and $\mu_{\tilde{A}}(x)$ a falls membership function, $\mu_{\tilde{A}}{}_A(x) : X\rightarrow$] 0^{-}, 1^{+} [, all these functions are real standard or nonstandard subsets of] 0^{-}, 1^{+}[, where X is non empty set [1, 10] .

Let Ω is a neutrosophic sample space that contains some or all of the data that are indeterminacy for the neutrosophic experiment. Then we can define Neutrosophic random variable X is a function defined on Ω.

This function may contain the undetermined in a domain or codomain of function, denoted by

X: Ω → any values (can be real or indeterminate values), that is, if $u \in \Omega$ then X(u) is equal to me or real number.

3. Dynamic Neutrosophic set

Let 0 ≠T, A is neutrosophic set , we will define A with respect to time t , such that t belong to T, T > 0 as follows:

$DA_t = \{\mu_A(t), I_A(t), \mu_{\tilde{A}}(t); t \in T\}$, this DA_t, is called dynamic neutrosophic set according to time t.

In the field of technolog

The dynamic neutrosophic class can be defined as

Dynamic neutrosophic data sets are a way of narrowing the number of choices with three degress a user can make on a form field. By narrowing a user's choices, they can enter data faster and more efficiently. You can also use dynamic neutrosophic data sets as a way of eliminating fields that are not necessary for specific situations.

Dynamic neutrosophic data sets are governed by a master element that dictates what some fields in the set will show and how others will behave. Data sets are considered "dynamic" because the values of the elements in the set change, depending on what the user chooses in the master element field. Dynamic data sets work with pull-down lists and radio buttons.

4. Dynamic Neutrosophic random variable

Consider Ω is neutrosophic sample space as T, such that T= (t_1, t_2, .., t_n), where t_i is equal to interval or real number or set or indeterminacy.

Define the Neutrosophic random variable X with respect to t, X(t), such that X: Ω →] 0^{-}, 1^{+} [or I .

Some examples of dynamic Neutrosophic

Example 1:-

If the time to arrival students to university between [7:30 -8:30], we can represent the interval of time according to time dynamically as follow:

Computed numbers of the students who arrive at this time [7:30 - 8:30] surly,

computed numbers of the students who not the arrival at this time [7:30 - 8:30] and

computed numbers of the students whose time arrivals are not determined at this time [7:30 - 8:30].

In other words, we can represent the students which arrival at this time [7:30 - 8:30] surly by X(t);

Represented the students who not the arrival at this time [7:30 - 8:30] by Y(t);

Represent of the students who time arrivals are not determined at [7:30 - 8:30] by Z(t).

Now, if suppose the number of students who came through this time is 50%, the number of students who did not arrive at this time 30%, and the number of students who arrive not determined at [7:30 - 8:30] are 20%. Thus, we can study define dynamical of arrival students according to this time as: $DA_t = \{X_A(t), Z_A(t), Y_A(t), ; t \in T\}$, = {50%, 20%, 30%} Such that A represent the arrival students.

Remark

In the above example, if to need to study according to t more precisely, where t = [7:30 - 8:30], in this case using the exponential distribution for all cases, that is study X(t) by exponential distribution and for Y(t), and Z(t), too .

Example:-2

Assuming we have a set of people, we want to know whether they have had a virus COVID-19 test during a specific time for three months since we can identify people who have an infection or immunity to this virus.

In this case, we consider the set of people as follow:

Let A is the neutrosophic set, some of the peoples are tested denoted by $X_A(t)$, some peoples are not tested, denoted by $Y_A(t)$ and other people are undefined who tested or not tested $Z_A(t)$ (that is: error of test, unknown who test or not, data of their not identified).

Let $DA_t = \{X_A(t), Z_A(t), Y_A(t), ; t \in T\}$ and T= [0 day - 90 day]

Such that, $X_A(t)$ represent the person who tests;

$Y_A(t)$ represent the person who not test;

$Z_A(t)$ represent the person who doesn't know about the test.

If, $X_A(t)$ =24%;

$Y_A(t)$=55%;

$Z_A(t)$ =67%

Then $DA_t = \{24\%, 55\%, 67\%\}$ and T= [0 day - 90 day]

In some data, if suppose number the person who tests 30%, if suppose number the person who does not test 70%, if suppose number the person who does not know about test 60%. Then $DA_t = \{ 30\%, 70\%, 60\% \}$ and T= [0 day - 20 day].

Example:-3

The following represent the neutrosophic dynamic data structure for Security A=ASL (NDS), B=KCR (NDS), C=PKI (NDS) and M=A∨B∨C

No.Nodes	A=ASL(NDS)	B=KCR(NDS)	C=PKI(NDS)	M=A∨B∨C
25	<0.026, 0.034, 0.94>	<0.95, 0.93, 0.07>	<0.15, 0.85, 0.15>	<0.95, 0.034, 0.15>
50	<0.021, 0.036, 0.943>	<0.021, 0.036, 0.943>	<0.2, 0.85, 0.15>	<0.2, 0.036, 0.15>
75	<0.025, 0.038, 0.937>	<0.95, 0.85, 0.15>	<0.23, 0.85, 0.15>	<0.95, 0.038, 0.15>
100	<0.022, 0.038, 0.939>	<0.96, 0.92, 0.08>	<0.26, 0.92, 0.08>	<0.96, 0.038, 0.08>
125	<0.015, 0.004, 0.981>	<0.96, 0.93, 0.07>	<0.3, 0.93, 0.07>	<0.96, 0.004, 0.07>
150	<0.017, 0.004, 0.979>	<0.96, 0.94, 0.06>	<0.32, 0.94, 0.06>	<0.96, 0.004, 0.06>
175	<0.014, 0.004, 0.982>	<0.96, 0.94, 0.06>	<0.36, 0.94, 0.06>	<0.95, 0.004, 0.06>
200	<0.023, 0.004, 0.973>	<0.96, 0.94, 0.06>	<0.4, 0.94, 0.06>	<0.96, 0.004, 0.06>
225	<0.02, 0.004, 0.976>	<0.02, 0.004, 0.976>	<0.44, 0.94, 0.06>	<0.44, 0.004, 0.06>
250	<0.015, 0.004, 0.981>	<0.96, 0.94, 0.06>	<0.45, 0.94, 0.06>	<0.96, 0.004, 0.06>

5. Discussion

Neutrosophic dynamic is an important technique of study the problem according to time in topology, choice, dynamical for some functions, and particularly in mathematical statistics. Neutrosophic dynamic is a dynamic analysis of a sequence of data according to time. Its employment in many problems in life such as a mathematical statistic, philosophy, medicine, and engineering.

In this paper, we defined this technique and it can use in the analysis of many problems by exponential distribution and distribution with the prior conjugate.

6. Conclusion and results

1. In this paper we were able to introduce a new concept of the neutrosophic technique is called a dynamic neutrosophic set, this concept is very important to applied in many phenomena in life .
2. The dynamic neutrosophic set is used in analysis dynamic according to time
3. Application to explain some problems in statistics, choice, topology.

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