GENERALIZATION OF SOFT NANO CONTINUITY IN NANO TOPOLOGICAL SPACE

*R.MURUGESHWARI, **Dr.S.SUBRAMANIAN

*M.Phil Student of Mathematics,PRIST Deemed to be University, Thanjavur-613 403.Tamilnadu, India

**HOD of Mathematics,PRIST Deemed to be University, Thanjavur-613 403.Tamilnadu, India

ABSTRACT

The properties of several weaker kinds of soft nano continuation on soft nano metric space, including such soft nano semi continuity, soft nano pre continuity, soft nano -continuity, and soft nano -continuity, are proposed and investigated in this study.

KEYWORDS: *Soft nano topological spaces, particularly soft nano semiopen, soft nano preopen, soft nano open, and soft nano open sets.*

INTRODUCTION:

Topology is the mathematical study of forms and hierarchical spaces. It's a field of mathematics dealing with the characteristics of space that are preserved when exposed to continuous elastic deformation like stretching and mixing but just not tearing or glueing. These traits include connectivity, homogeneity, continuity, and limit.

Topology develops as a topic of study from mathematics and set theory as a result of the investigation of concepts such as space, aspect, and transition. The term topology was coined in the nineteenth century by Johann Bebedict Listing, but the concept of a metric space did not arise until the first decades of the 20th century.

In 2014, Kandil et al. introduced the concept of -y to unify several types of soft continuity in soft topological spaces. In 1999, Russian mathematician Molodtsov introduced the concept of soft sets, a completely generic mathematical tool for modelling uncertainty. Maji et al. also conducted a soft set theory study, which included a discussion of soft set theory's relevance to decision-making challenges. Soft topological spaces, suggested by Shabir and Naz, are defined over an initial universe with a set of parameters. S. Hussain and B. Ahmad, as well as Naim Cagman et al., have continued their research into the properties of soft topological spaces.

The notion of Nano topology was first proposed by Lellis Thivagar. Based on the universal set's soft set equivalence relation, Benchalli et al. established the concept of soft nano topological spaces. Continuity and its breakdown have been extensively studied in the domains of topology and other branches of mathematics. Nano topology was defined by Lellis Thivagar.M and Carmel Richard, who researched a new objective function known as Nano Continuous Functions, as well as their representations in tiny topological spaces.

SOFT NANO CONTINUITY:

Definition1.1

A topology on a set X is a set of subsets with the following properties:

Both I and X are present.

(ii) Any subcollection of is equal to the sum of its parts.

(iii) At the intersection of its elements is any finite subcollection of.

Definition 1.2

Let E denote a set of parameters, and X denote a starting universe. If is a soft topology on X and is a collection of soft sets over X, then I X belongs to.

(ii) is a soft set in X that belongs to the union of any number of soft sets.

(iii) belongs to any two sets in X that cross.

Definition1.3

Let X denote the initial universe set, E denote a set of parameters, and A denote the non-empty subset of E. Consider (X,, E) as a soft topological space over X. A soft set (F, A) over X is said to be a soft closed in X if its relative complement belongs to.

1.4 Definition

Let X denote the initial universe set, E denote a set of parameters, and A denote the non-empty subset of E. Let (X,, E) signify a soft subset of X and (F, A) denote a soft topological space over X. The soft closure of (F, A) represented by cl is the intersection of all soft closed super sets of (F, A) (F,A).

Definition1.5

Let X denote the initial universe set, E denote a set of parameters, and A denote the non-empty set of E. Over X, a soft topological space exists (X,, E). The soft core of subset (F, A) X is denoted by the integer (F, A), which is defined as the union of any and all soft open sets included in (F, A).

Definition 1.6

Let X denote the initial universe set, E denote a set of parameters, and A denote the non-empty subset of E. Over X, a soft topological space exists (X,, E). If a soft open set (G, A) exists such that (G, A) cl (G, A), then the soft set (F, A) over X is a soft semi open in X. The complement of the soft semi open set in X is the soft semi closed set.

Definition1.7

Let (R(X), U, E) be a soft micro topological space, and SS(X)E SS(X)E be the following operation:

The soft nano pre-open operator is then applied to I = Nint (NCl), and the set of all soft nano pre-open sets is denoted by SNPO (X, E),

Definition1.8

Consider the soft nano topological regions (R(X), U, E) and (R(Y), V, K).

Then there is a mapping f: (R(X), U, E) (R′ (Y), V, K):

I soft nano partially continuous if f 1(G, K) SNSO(X,E), (G,K) SNO(Y,K), or equivalently, because inverse counterpart of every soft nano opening set over V is soft nano semi open over U.

(ii) soft nano main focus, if f 1(G, K) SN O(X,E), (G,K) SNO(Y,K), or the inverse image of each and every firm nano open set across V is soft nano -open set over U,

(iii) If f 1(G, K) SN O(X,E), (G,K) SNO(Y,K), the inverse image of any soft nano open set over V is soft nano -open set over U.

Theorem 1.1

Let (R(X), U, E) and (R′ (Y), V, K) be two soft nano topological spaces, and f : (R(X), U, E) f : (R(X), U, E) f : (R(X), U, E) f : (R(X), U, E) f : (R(X), U, E) f : (R(X), U, E) f : (The following points apply to the soft nano semi continuous function classes (soft nano pre-continuous, soft nano continuous, and soft nano continuous, respectively):

(1) f is indeed a soft nano value that is semi-continuous,

(2) f (NCl(NInt(G, E)) NCl(NInt(f (G, E)) NCl(NInt(f (G, E)) NCl(NInt(f (G, E))

(3) NCl(NInt(f 1(G, K)) f 1(NCl(NInt((G, K)) f 1(NCl(NInt((G, K)) f 1(NCl(NInt((G, K)) f 1(NCl(NInt((G, K)) f 1(NCl(NInt((G, K))(G, K) on top of V.

Proof:

(Hint: Use the 1.8 definition.)

Definition1.9

Take a look at the soft micro metric space (R(X), U, E) and (R′ (Y), V, K). A map f: (R(X), U, E) (R′ (Y), V, K) is referred soft nano - continuous if f 1(G, K) SNO(X, E), (G, K) SNO(Y, K). Soft nano opening set over U is the inverse image of any soft nano open set over V, or vice versa.

Definition 1.10

Take a look at the soft micro metric space (R(X), U, E) and (R′ (Y), V, K). A map f: (R(X), U, E) (R′ (Y), V, K) is normally referred nano - continuous if f 1(G, K) SNSO(X, E), (G, K) SNO(Y, K). The inverse image of any soft nano open set over V is a soft nano semi open set over U.

Definition 1.11

Assume (R(X), U, E) and (R′ (Y), V, K) soft micro topological spaces. A map f: (R(X), U, E) (R′ (Y), V, K) is normally referred nano pre-continuous if f 1(G, K) SNPO(X, E), (G, K) SNO(Y, K). The inverse image of any soft nano open set over V is a soft nano semi open set over U. (i.e. SNPO f 1(G, K)) (X, E).

Definition 1.12

Assume (R(X), U, E) and (R′ (Y), V, K) soft micro topological spaces. A map f: (R(X), U, E) (R′ (Y), V, K) is referred to nano - continuous if f 1(G, K) SNO(X, E), (G, K) SNO(Y, K). Soft nano open setting over U is the inverse image of any soft nano open set over V, or vice versa.

Theorem 1.2

Consider (R(X), U, E) (R′ (Y), V, K) a mapping for f.

(1) Each soft nano function that is semicontinuous is also a consistent soft nano function.

(2) All soft nano semi-continuous functions are soft nano-continuous functions.

(3) Every soft nano-continuous function is a soft nano-continuous function as well.

(4) There is a soft nano-precontinuous function for every soft nano-continuous function.

Proof:

(Hint: Use the 1.9,1.10,1.11,1.12 definitions.)

Definition 1.13

The map f: (R(X), U, E) (R′ (Y), V, K) is referredto a soft nano semi closed if the image of any soft nano semi closed set over U is soft nano closed over V.

Definition 1.14

If (i) f itself is and onto, (ii) f is soft nano half continuous, and (iii) f is soft nano semi open, a soft nano half homeomorphism is defined as (R(X), U, E) (R′ (Y), V, K).

Theorem 1.3

Assume that the mapf : (R(X), U, E) (R′ (Y), V, K) is one-to-one. F is a soft nano semi homeomorphism if and only if f is a soft nano semi closed and soft nano semi continuous mapping. Assume that (G, E) is a soft set over U and that (R(X), U, E) is a soft microtopological space. The overlap of all soft nano-closed sets containing (G, E) is then represented by NCl, and the soft nano-closure for (G, E) is the overlap of all soft nano-closed sets containing (G, E) (G, E

Theorem 1.4

The following statements are identical if f is a soft mapping between (R(X), U, E) and (R′ (Y), V, K), and (R(X), U, E) and (R′ (Y), V, K) are soft nano topological spaces:

(1) f is a soft nano -continuous function, (2) the inverse image of each soft nano closed set (G, E) over V is soft nano -closed set over U, and (3) the inverse image of each soft nano closed set (G, E) over V is soft nano -closed set over U.

(3)f NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl((G, E)

Theorem 1.5

Suppose that the map f : (R(X), U, E) (R′ (Y), V, K) is one-to-one. F is a soft nano semi homeomorphism if and only if f is a soft nano semi closed and soft nano semi continuous mapping. Assume that (G, E) is a soft set over U and that (R(X), U, E) is a soft microtopological space. The overlapping of all soft nano-closed sets containing (G, E) is then represented by NCl, and the soft nano-closure for (G, E) is the overlap of all soft nano-closed describe a particular (G, E) (G, E). NInt(G, E) denotes the soft nano -interior for (G, E), which is the union of all soft nano -open sets included within (G, E) (G, E).

Theorem 1.6

The following comments are identical if f is a soft mapping between (R(X), U, E) and (R′ (Y), V, K), and (R(X), U, E) and (R′ (Y), V, K) are soft nano topological spaces:

(1) f is a soft nano -continuous variable, (2) the inverse imagery of each soft nano closed set (G, E) across V is soft nano -closed set over U, and (3) the reversal image from each soft nano subset (G, E) over V is soft nano -closed set over U.

(3)f NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl(f (G, E)) NCl((G, E)

CONCLUSION:

In this paper, we look at how soft nano continuity can be generalised as semi-continuity and pre-continuity. Soft nano continuity is utilised in a range of applications, including computer discussion and decision, artificial neural and analytical thinking, smart computing databases, and machine reasoning, to name a few.

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