Available online at www.sciencedirect.com

ScienceDirect

Procedia Computer Science 47 (2015) 319 – 325

Procedia Computer Science

On Intuitionistic Fuzzy Semi - Supra Open Set and Intuitionistic Fuzzy Semi - Supra Continuous Functions

M. Parimala , C. Indirani,[1]

Bannari Amman Institute of Technology, Sathyamangalam – 638 401, Erode, Tamil Nadu, INDIA

Abstract

In this paper, we introduce and investigate a new class of sets and functions between topological space called intuitionistic fuzzy semi-supra open set and intuitionistic fuzzy semi-supra open continuous functions respectively..

Peer-review under responsibility of organizing committee of the Graph Algorithms, High Performance Implementations and Applications (ICGHIA2014)

Keywords: Supra topological spaces: intuitionistic fuzzy supra-topological spaces: intuitionistic fuzzy semi-supra open set

1. Introduction and preliminaries.

Intuitionistic fuzzy set is defined by Atanassov [2] as a generalization of the concept of fuzzy set given by Zadesh [9]**.** Using the notation of intuitionistic fuzzy sets, Coker [3] introduced the notation of intuitionistic fuzzy topological spaces. The supra topological spaces and studied s-continuous functions and s^*-continuous functions were introduced by A. S. Mashhour [5] in 1993. In 1987, M. E. Abd El-Monsef et al. [1] introduced the fuzzy supra topological spaces and studied fuzzy supra continuous functions and obtained some properties and characterizations. In1996, Keun Min [8] introduced fuzzy s-continuous, fuzzy s-open and fuzzy s-closed maps and established a number of characterizations. In 2008, R. Devi et al [4] introduced the concept of supra α-open set , and in 1983, A. S. Mashhour et al. introduced, the notion of supra- semi open set, supra semi-continuous functions and studied some of the basic properties for this class of functions. In 1999, Necla Turan [6] introduced the concept of intuitionistic fuzzy supra topological space . In this paper, we introduce the notation of intuitionistic fuzzy semi-supra open sets and the basic properties of intuitionistic fuzzy semi-supra open sets and introduce the notation of intuitionistic

1

* Corresponding author. Tel.: 09788362031 ; fax: +0-4295-226666 .
E-mail address: parimalam@bitsathy.ac.in, indiranic@bitsathy.ac.in

Peer-review under responsibility of organizing committee of the Graph Algorithms, High Performance Implementations and Applications (ICGHIA2014)
doi:10.1016/j.procs.2015.03.211

fuzzy semi-supra continuous functions.

Throughout this paper, by (X,τ) or simply by X we will denote the intuitionistic fuzzy supra topological space (briefly, IFTS). For a subset A of a space (X,τ), cl(A), int(A) and $\overline{A}$ denote the closure of A, The interior of A and the complement of A respectively. Each intuitionistic fuzzy supra set (briefly, IFS) which belongs to (X,τ) is called an intuitionistic fuzzy supra open set (briefly, IFSOS) in X. The compliment $\overline{A}$ of an IFSOS A in X is called an intuitionistic fuzzy supra closed set (IFSCS) in X.

We introduce some basic notations and results that are used in the sequel.

Definition 1.1 [2] Let X be a non empty fixed set and I be the closed interval [0,1]. In intuitionistic fuzzy set (IFS) A is an object of the following form

$$A=\{\langle x,\mu_A(x),\nu_A(x)\rangle : x\in X\}$$

where the mapping $\mu_A : X\to I$ *and* $\nu_A : X\to I$ denote the degree of membership (namely $\mu_A(x)$) and the degree of non membership (namely $\nu_A(x)$) for each element $x\in X$ to the set A, respectively, and $0\le \mu_A(x)+\nu_A(x)\le 1$ for each $x\in X$.

Obviously, every fuzzy set A on a nonempty set X is an IFS of the following form

$A=\{\langle x,\mu_A(x),1\text{-}\ \mu_A(x)\rangle : x\in X\}$

Definition 1.2 [2] Let A and B be IFSs of the form $A=\{\langle x,\mu_A(x),\nu_A(x)\rangle : x\in X\}$ *and* $A=\{\langle x,\mu_B(x),\nu_B(x)\rangle : x\in X\}$ and $B=\{\langle x,\mu_B(x),\nu_B(x)\rangle : x\in X\}$. Then

(i) $A\subseteq B$ *if and only if* $\mu_A(x)\le \mu_B(x)$ *and* $\nu_A(x)\ge \nu_B(x)$;

(ii) $\overline{A}=\{\langle x,\nu_A(x),\mu_A(x)\rangle : x\in X\}$;

(iii) $A\cap B=\{\langle x,\mu_A(x)\wedge \mu_B(x),\nu_A(x)\vee \nu_B(x)\rangle : x\in X\}$;

(iv) $A\cup B=\{\langle x,\mu_A(x)\vee \mu_B(x),\nu_A(x)\wedge \nu_B(x)\rangle : x\in X\}$;

(v) A = B iff $A\subseteq B$ *and* $B\subseteq A$;

(vi) [ ] A $=\{\langle x,\mu_A(x),1\text{-}\ \mu_A(x)\rangle : x\in X\}$;

(vii) $\langle\rangle A=\{\langle x,1-\nu_A(x),\ \nu_A(x)\rangle : x\in X\}$;

(viii) $1_\sim=\{\langle x,1,0\rangle, x\in X\}$ and $0_\sim=\{\langle x,1,0\rangle, x\in X\}$;

We will use the notation $A=\langle x,\mu_A,\mu_A\rangle$ instead of A= $\{\langle x,\mu_A(x),\ \nu_A(x)\rangle : x\in X\}$;

Definition 1.3. [6] A family τ of IFS's on X is called an intuitionistic fuzzy supra topology (IFST for short) on X if $0_\sim\in\tau, 1_\sim\in\tau$ *and* τ is closed under arbitrary suprema. Then we call the pair (X,τ) an intuitionistic fuzzy supra topological space (IFSTS for short). Each member of τ is called an intuitionistic fuzzy supra open set and the complement of an intuitionistic fuzzy supra open set is called an intuitionistic