On Generalized Semi Homeomorphism in Intuitionistic Fuzzy Topological Spaces

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ABSTRACT

In this paper I have introduced intuitionistic fuzzy generalized semi closed mappings, intuitionistic fuzzy generalized semi homeomorphism and intuitionistic fuzzy M-generalized semi homeomorphism in intuitionistic fuzzy topological spaces. I have given suitable examples in intuitionistic fuzzy topological spaces for these concepts. Also I have provided some characterizations of intuitionistic fuzzy generalized semi homeomorphisms.

KEYWORDS

Intuitionistic fuzzy topology, intuitionistic fuzzy generalized semi closed set, intuitionistic fuzzy generalized semi closed mapping, intuitionistic fuzzy generalized semi homeomorphism, and intuitionistic fuzzy M-generalized semi homeomorphism.

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1. INTRODUCTION

The concept of intuitionistic fuzzy sets was introduced by Atanassov [1] as a generalization of fuzzy sets in 1983. Coker [3] introduced intuitionistic fuzzy topological spaces using the notion of intuitionistic fuzzy sets. In this paper I have introduced intuitionistic fuzzy generalized semi closed mappings, intuitionistic fuzzy generalized semi homeomorphism and intuitionistic fuzzy M-generalized semi homeomorphism. These concepts are analyzed with the existing intuitionistic fuzzy continuous mappings and intuitionistic fuzzy closed mappings. Also I have provided some characterizations of intuitionistic fuzzy generalized semi homeomorphism.

2. PRELIMINARIES

Definition 2.1: [1] An intuitionistic fuzzy set (IFS in short) A in X is an object having the form $A=\{\langle x,\mu_A(x), \nu_A(x)\rangle/x\in X\}$where the functions $\mu_A(x)$: $X \to [0, 1]$ and $\nu_A(x)$: $X \to [0, 1]$ denote the degree of membership (namely $\mu_A(x)$) and the degree of non -membership (namely $\nu_A(x)$) of each element $x \in X$ to the set A, respectively, and $0 \leq \mu_A(x) + \nu_A(x) \leq 1$ for each $x \in X$. Denote by IFS(X), the set of all intuitionistic fuzzy sets in X.

Definition 2.2:[3] An intuitionistic fuzzy topology (IFT in short) on X is a family τ of IFSs in X satisfying the following axioms.

(i) $0_\sim, 1_\sim \in \tau$
(ii) $G_1 \cap G_2 \in \tau$ for any $G_1, G_2 \in \tau$
(iii) $\cup G_i \in \tau$ for any family $\{ G_i / i \in J \} \subseteq \tau$.

Here the pair (X, τ) is called an intuitionistic fuzzy topological space (IFTS in short)

Definition 2.3:[3] Let (X, τ) be an IFTS and $A = \langle x, \mu_A, \nu_A \rangle$ be an IFS in X. Then the intuitionistic fuzzy interior and intuitionistic fuzzy closure are defined by
$\mathrm{int}(A) = \cup \{ G / G$ is an IFOS in X and $G \subseteq A \}$,
$\mathrm{cl}(A) = \cap \{ K / K$ is an IFCS in X and $A \subseteq K \}$.
For any IFS A in (X, τ), we have $\mathrm{cl}(A^c) = (\mathrm{int}(A))^c$ and $\mathrm{int}(A^c) = (\mathrm{cl}(A))^c$.

Definition 2.4: An IFS $A = \langle x, \mu_A, \nu_A \rangle$ in an IFTS (X, τ) is said to be an

(i) intuitionistic fuzzy semi closed set (IFSCS in short) if $\mathrm{int}(\mathrm{cl}(A)) \subseteq A$ [5],
(ii) intuitionistic fuzzy α-closed set (IFαCS in short) if $\mathrm{cl}(\mathrm{int}(\mathrm{cl}(A)) \subseteq A$ [5],
(iii) intuitionistic fuzzy γ closed set (IFγCS in short) if $\mathrm{int}(\mathrm{cl}(A)) \cap \mathrm{cl}(\mathrm{int}(A)) \subseteq A$ [6].

Definition 2.5:[5] Let A be an IFS in an IFTS (X, τ). Then
$\mathrm{sint}(A) = \cup \{ G / G$ is an IFSOS in X and $G \subseteq A \}$,
$\mathrm{scl}(A) = \cap \{ K / K$ is an IFSCS in X and $A \subseteq K \}$.

Definition 2.6:[12] An IFS A in an IFTS (X, τ) is said to be an intuitionistic fuzzy generalized semi closed set (IFGSCS in short) if $\mathrm{scl}(A) \subseteq U$ whenever $A \subseteq U$ and U is an IFOS in (X, τ). Every IFCS, IFSCS and IFαCS are IFGSCS.

Definition 2.7:[11] Let f be a mapping from an IFTS (X, τ) into an IFTS (Y, σ). Then f is said to be an

(i) intuitionistic fuzzy closed mapping (IF closed mapping in short) if f(A) is an IFCS in Y for every IFCS A in X.
(ii) intuitionistic fuzzy semi closed mapping (IFS closed mapping in short) if f(A) is an IFSCS in Y for every IFCS A in X.
(iii) intuitionistic fuzzy α-closed mapping (IFα closed mapping in short) if f(A) is an IFαCS in Y for every IFCS A in X.
(iv) intuitionistic fuzzy γ-closed mapping (IFγ closed mapping in short) if f(A) is an IFγCS in Y for every IFCS A in X.

Definition 2.8:[12] Let f be a mapping from an IFTS (X, τ) into an IFTS (Y, σ). Then f is said to be

(i) intuitionistic fuzzy continuous (IF continuous in short) if $f^{-1}(B)$ is an IFOS in X for every IFOS B in Y.

(ii) intuitionistic fuzzy semi continuous (IFS continuous in short) if $f^{-1}(B)$ is an IFSOS in X for every IFOS B in Y.
(iii) intuitionistic fuzzy generalized semi continuous (IFGS continuous in short) if $f^{-1}(B)$ is an IFGSCS in X for every IFCS B in Y.

Definition 2.9:[9] Let f be a bijection mapping from an IFTS (X, τ) into an IFTS (Y, σ). Then f is said to be
(i) intuitionistic fuzzy homeomorphism (IF homeomor -phism in short) if f and f^{-1} are IF continuous mappings.
(ii) intuitionistic fuzzy semi homeomorphism (IFS homeomorphism in short) if f and f^{-1} are IFS continuous mappings

Definition 2.10:[12] An IFTS (X, τ) is said to be an intuitionistic fuzzy ${}_cT_{1/2}$ (in short IF${}_cT_{1/2}$) space if every IFGSCS in X is an IFCS in X.

3. INTUITIONISTIC FUZZY GENERALI -ZED SEMI CLOSED MAPPINGS

In this section I have introduced intuitionistic fuzzy generalized semi closed mappings, intuitionistic fuzzy generalized semi open mappings and studied some of its properties.

Definition 3.1: A mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy generalized semi closed (IFGS closed in short) mapping if for every IFCS A of (X, τ), f(A) is an IFGSCS in (Y, σ).

Example 3.2: Let X = {a, b}, Y = {u, v} and T_1 = ⟨ x, (0.6, 0.6), (0.2, 0.3) ⟩, T_2 = ⟨ y, (0.2, 0.2), (0.8, 0.7) ⟩. Then τ = {0~, T_1, 1~} and σ = { 0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS closed mapping.

Definition 3.3: A mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy generalized semi open (IFGS open in short) mapping if for every IFOS A of (X, τ), f(A) is an IFGSOS in (Y, σ).

Example 3.4: Let X = {a, b}, Y = {u, v} and T_1 = ⟨ x, (0.2, 0.3), (0.6, 0.7) ⟩, T_2 = ⟨ y, (0.5, 0.6), (0.5, 0.4) ⟩. Then τ = {0~, T_1, 1~} and σ = { 0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS open mapping.

Theorem 3.5: Every IF closed mapping is an IFGS closed mapping but not conversely.

Proof: Let f: (X, τ) → (Y, σ) be an IF closed mapping. Let A be an IFCS in X. Since f is an IF closed mapping, f(A) is an IFCS in Y. Since every IFCS is an IFGSCS, f(A) is an IFGSCS in Y. Hence f is an IFGS closed mapping.

Example 3.6: Let X = {a, b}, Y = {u, v} and T_1 = ⟨ x, (0.4, 0.4), (0.3, 0.6) ⟩, T_2 = ⟨ y, (0.5, 0.4), (0.5, 0.6) ⟩. Then τ = {0~, T_1, 1~} and σ = { 0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS closed mapping but not an IF closed mapping since A = ⟨ x, (0.3, 0.6), (0.4, 0.4) ⟩ is an IFCS in X but f(A) = ⟨ y, (0.3, 0.6), (0.4, 0.4) ⟩ is not an IFCS in Y.

Theorem 3.7: Every IFS closed mapping is an IFGS closed mapping but not conversely.

Proof: Let f: (X, τ) → (Y, σ) be an IFS closed mapping. Let A be an IFCS in X. By hypothesis, f(A) is an IFSCS in Y. Since every IFSCS is an IFGSCS, f(A) is an IFGSCS in Y. Hence f is an IFGS closed mapping.

Example 3.8: Let X = { a, b }, Y = { u, v } and T_1 = ⟨ x, (0.2, 0.2), (0.7, 0.8) ⟩, T_2 = ⟨ y, (0.5, 0.4), (0.5, 0.6) ⟩. Then τ = {0~, T_1, 1~} and σ = {0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS closed mapping but not an IFS closed mapping since A = ⟨ x, (0.7, 0.8), (0.2, 0.2) ⟩ is an IFCS in X but f(A) = ⟨ y, (0.7, 0.8), (0.2, 0.2) ⟩ is not an IFSCS in Y.

Theorem 3.9: Every IFα closed mapping is an IFGS closed mapping but not conversely.

Proof: Let f: (X, τ) → (Y, σ) be an IFα closed mapping. Let A be an IFCS in X. By hypothesis, f(A) is an IFαCS in Y. Since every IFαCS is an IFGSCS, f(A) is an IFGSCS in Y. Hence f is an IFGS closed mapping.

Example 3.10: Let X = { a, b }, Y = { u, v } and T_1 = ⟨ x, (0.2, 0.2), (0.8, 0.8) ⟩, T_2 = ⟨ y, (0.5, 0.4), (0.5, 0.6) ⟩. Then τ = {0~, T_1, 1~} and σ = {0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS closed mapping but not an IFα closed mapping since A = ⟨ x, (0.8, 0.8), (0.2, 0.2) ⟩ is an IFCS in X but f(A) = ⟨ y, (0.8, 0.8), (0.2, 0.2) ⟩ is not an IFαCS in Y.

Remark 3.11: An IFγ closed mapping and an IFGS closed mapping are independent to each other.

Example 3.10: Let X = { a, b }, Y = { u, v } and T_1 = ⟨ x, (0.6, 0.2), (0.4, 0.3) ⟩, T_2 = ⟨ y, (0.4, 0.6), (0.2, 0.2) ⟩, Then τ = {0~, T_1, 1~} and σ = {0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFγ closed mapping but not an IFGS closed mapping since A = ⟨ x, (0.4, 0.3), (0.6, 0.2) ⟩ is an IFCS in X but f(A) = ⟨ y, (0.4, 0.3), (0.6, 0.2) ⟩ is not an IFGSCS in Y.

Example 3.12: Let X = { a, b }, Y = { u, v } and T_1 = ⟨ x, (0.2, 0.1), (0.7, 0.8) ⟩, T_2 = ⟨ y, (0.5, 0.1), (0.5, 0.9) ⟩. Then τ = {0~, T_1, 1~} and σ = {0~, T_2, 1~} are IFTs on X and Y respectively. Define a mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS closed mapping but not an IFγ closed mapping since A = ⟨ x, (0.7, 0.8), (0.2, 0.1) ⟩ is an IFCS in X but f(A) = ⟨ y, (0.7, 0.8), (0.2, 0.1) ⟩ is not an IFγCS in Y.

Theorem 3.13: A mapping f: X → Y is an IFGS closed mapping if and only if the image of each IFOS in X is an IFGSOS in Y.

Proof: Let A be an IFOS in X. This implies A^c is IFCS in X. Since f is IFGS closed mapping, $f(A^c)$ is an IFGSCS in Y. Since $f(A^c) = (f(A))^c$, f(A) is an IFGSOS in Y.

The relations between various types of intuitionistic fuzzy closed mappings are given in the following diagram. In this diagram 'cl.map.' means closed mapping.

$$\begin{tikzcd}
 & \text{IFS cl.map.} \arrow[dr] & \\
\text{IF cl.map.} \arrow[ur] \arrow[rr] \arrow[dr] & & \text{IFGS cl.map.} \\
 & \text{IF}\alpha\text{ cl.map.} \arrow[ur] &
\end{tikzcd}$$

The reverse implications are not true in general.

Theorem 3.14: Let f: (X, τ) → (Y, σ) be a mapping from an IFTS X into an IFTS Y. Then the following conditions are equivalent if Y is an $IF_cT_{1/2}$ space.

(i) f is an IFGS closed mapping
(ii) If A is an IFOS in X then f(A) is an IFGSOS in Y
(iii) f(int(A)) ⊆ cl(int(f(A))) for every IFS A in X.

Proof: (i) ⇒ (ii): is obviously true.

(ii) ⇒ (iii): Let A be any IFS in X. Then int(A) is an IFOS in X. Then f(int(A)) is an IFGSOS in Y. Since Y is an $IF_cT_{1/2}$ space, f(int(A)) is an IFOS in Y. Therefore f(int(A)) = int(f(int(A)) ⊆ cl(int(f(A))).

(iii) ⇒ (i): Let A be an IFCS in X. Then its complement A^c is an IFOS in X. By hypothesis $f(int(A^c)) \subseteq cl(int(f(A^c)))$. This implies $f(A^c) \subseteq cl(int(f(A^c)))$. Hence $f(A^c)$ is an IFSOS in Y. Since every IFSOS is an IFGSOS, $f(A^c)$ is an IFGSOS in X. Therefore f(A) is an IFGSCS in X. Hence f is an IFGS closed mapping.

Theorem 3.15: Let f : (X, τ) → (Y, σ) be an IF closed mapping and g : (Y, σ) → (Z, δ) is IFGS closed mapping, then g ₒ f : (X, τ) → (Z, δ) is an IFGS closed mapping.

Proof: Let A be an IFCS in X. Then f(A) is an IFCS in Y, by hypothesis. Since g is an IFGS closed mapping, g(f(A)) is an IFGSCS in Z. Hence g ₒ f is an IFGS closed mapping.

Theorem 3.16: Let f: (X, τ) → (Y, σ) be a mapping. Then the following conditions are equivalent if X is an $IF_cT_{1/2}$ space.

(i) f is an IFGS closed mapping
(ii) f(A) is an IFGSCS in Y for every IFCS A in X
(iii) int(cl(f(A))) ⊆ f(cl(A)) for every IFS A in X.

Proof: (i) ⇒ (ii): is obviously true.

(ii) ⇒ (iii): Let A be an IFS in X. Then cl(A) is an IFCS in X. By hypothesis, f(cl(A)) is an IFGSCS in Y. Since Y is an $IF_cT_{1/2}$ space, f(cl(A)) is an IFCS in Y. Therefore cl(f(cl(A)) = f(cl(A)). Now int(cl(f(A))) ⊆ cl(cl(f(cl(A)))) ⊆ f(cl(A)).

(iii) ⇒ (i): Let A be an IFCS in X. By hypothesis int(cl(f(A))) ⊆ f(cl(A)) = f(A). This implies f(A) is an IFSCS in Y and hence f(A) is an IFGSCS in Y. Therefore f is an IFGS closed mapping.

4. INTUITIONISTIC FUZZY GENERALI -ZED HOMEOMORPHISMS

In this section I have introduced intuitionistic fuzzy generalized semi homeomorphism and studied some of its properties with suitable examples.

Definition 4.1: A bijection mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy generalized semi homeomorphism (IFGS homeomorphism in short) if f and f^{-1} are IFGS continuous mappings.

Example 4.2: Let X = {a, b}, Y = {u, v} and T_1 = ⟨ x, (0.3, 0.3), (0.6, 0.7) ⟩, T_2 = ⟨ y, (0.4, 0.8), (0.4, 0.2) ⟩. Then τ = {0~, T_1, 1~} and σ = { 0~, T_2, 1~} are IFTs on X and Y respectively. Define a bijection mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS continuous mapping and f^{-1} is also an IFGS continuous mapping. Therefore f is an IFGS homeomorphism.

Theorem 4.3: Every IF homeomorphism is an IFGS homeomorphism but not conversely.

Proof: Let f: (X, τ) → (Y, σ) be an IF homeomorphism. Then f and f^{-1} are IF continuous mappings. This implies f and f^{-1} are IFGS continuous mappings. That is the mapping f is IFGS homeomorphism.

Example 4.4: Let X = {a, b}, Y = {u, v} and T_1 = ⟨ x, (0.3, 0.3), (0.6, 0.7) ⟩, T_2 = ⟨ y, (0.5, 0.4), (0.4, 0.2) ⟩. Then τ = {0~, T_1, 1~} and σ = { 0~, T_2, 1~} are IFTs on X and Y respectively. Define a bijection mapping f: (X, τ) → (Y, σ) by f(a) = u and f(b) = v. Then f is an IFGS homeomorphism but not an IF homeomorphism since f and f^{-1} are not an IF continuous mappings.

Definition 4.5: A bijection mapping f: (X, τ) → (Y,σ) is called an intuitionistic fuzzy semi homeomorphism (IFS homeomorphism in short) if f and f^{-1} are IFS continuous mappings.

Theorem 4.6: Every IFS homeomorphism is an IFGS homeomorphism but not conversely.

Proof: Let f: $(X, \tau) \rightarrow (Y, \sigma)$ be an IFS homeomorphism. Then f and f^{-1} are IFS continuous mappings. This implies f and f^{-1} are IFS continuous mappings. Hence f and f^{-1} are IFGS continuous mappings. That is the mapping f is an IFGS homeomorphism.

Example 4.7: Let X = { a, b }, Y = { u, v } and $T_1 = \langle$ x, (0.5, 0.4), (0.5, 0.5) $\rangle$, $T_2 = \langle$ y, (0.2, 0.2), (0.7, 0.8) $\rangle$. Then $\tau = \{0_\sim, T_1, 1_\sim\}$ and $\sigma = \{0_\sim, T_2, 1_\sim\}$ are IFTs on X and Y respectively. Define a mapping f: $(X, \tau) \rightarrow (Y, \sigma)$ by f(a) = u and f(b) = v. Then f is an IFGS homeomorphism. Consider an IFCS A = $\langle$ y, (0.7, 0.8), (0.2, 0.2) $\rangle$ in Y. Then $f^{-1}(A) = \langle$ x, (0.7, 0.8), (0.2, 0.2) $\rangle$ is not an IFSCS in X. This implies f is not an IFS continuous mapping. Hence f is not an IFS homeomorphism.

Theorem 4.8: Let f: $(X, \tau) \rightarrow (Y, \sigma)$ be an IFGS homeomorphism, then f is an IF homeomorphism if X and Y are $IF_cT_{1/2}$ space.

Proof: Let B be an IFCS in Y. Then $f^{-1}(B)$ is an IFGSCS in X, by hypothesis. Since X is an $IF_cT_{1/2}$ space, $f^{-1}(B)$ is an IFCS in X. Hence f is an IF continuous mapping. By hypothesis f^{-1}: $(Y, \sigma) \rightarrow (X, \tau)$ is a IFGS continuous mapping. Let A be an IFCS in X. Then $(f^{-1})^{-1}(A) = f(A)$ is an IFGSCS in Y, by hypothesis. Since Y is an $IF_cT_{1/2}$ space, f(A) is an IFCS in Y. Hence f^{-1} is an IF continuous mapping. Hence the mapping f is an IF homeomorphism.

Theorem 4.9: Let f: $(X, \tau) \rightarrow (Y, \sigma)$ be a bijective mapping. If f is an IFGS continuous mapping, then the following are equivalent.

(i) f is an IFGS closed mapping
(ii) f is an IFGS open mapping
(iii) f is an IFGS homeomorphism.

Proof: (i) →(ii): Let f: $(X, \tau) \rightarrow (Y, \sigma)$ be a bijective mapping and let f is an IFGS closed mapping. This implies f^{-1}: $(Y, \sigma) \rightarrow (X, \tau)$ is IFGS continuous mapping. That is every IFOS in X is an IFGSOS in Y. Hence f is an IFGS open mapping.

Proof: (ii) →(iii): Let f: $(X, \tau) \rightarrow (Y, \sigma)$ be a bijective mapping and let f is an IFGS open mapping. This implies f^{-1}: $(Y, \sigma) \rightarrow (X, \tau)$ is IFGS continuous mapping. But f is an IFGS continuous mapping. by hypothesis. Hence f and f^{-1} are IFGS continuous mappings. That is f is an IFGS homeomorphism.

(iii) →(i): Let f is an IFGS homeomorphism. That is f and f^{-1} are IFGS continuous mappings. Since every IFCS in X is an IFGSCS in Y, f is an IFGS closed mapping.

Remark 4.10: The composition of two IFGS homeomorphisms need not be an IFGS homeomorphism in general.

Example 4.11: Let X = {a, b}, Y = {c, d} and Z = {u, v}. Let $T_1 = \langle$x, (0.7, 0.6), (0.2, 0.4)$\rangle$, $T_2 = \langle$ y, (0.6, 0.1), (0.4, 0.3) $\rangle$ and $T_3 = \langle$ z, (0.4, 0.4), (0.6, 0.2) $\rangle$. Then $\tau = \{0_\sim, T_1, 1_\sim\}$, $\sigma = \{0_\sim, T_2, 1_\sim\}$ and $\Omega = \{0_\sim, T_3, 1_\sim\}$ are IFTs on X,Y and Z respectively. Define a bijection mapping f: $(X, \tau) \rightarrow (Y, \sigma)$ by f(a) = c , f(b) = d and g: $(Y, \sigma) \rightarrow (Z, \Omega)$ by f(c) = u , f(d) = v. Then f and f^{-1} are IFGS continuous mappings. Also g and g^{-1} are IFGS continuous mappings. Hence f and g are IFGS homeomorphisms. But the composition $g \circ f$: $X \rightarrow Z$ is not an IFGS homeomorphism since $g \circ f$ is not an IFGS continuous mapping.

Definition 4.12: A bijection mapping f: $(X, \tau) \rightarrow (Y,\sigma)$ is called an intuitionistic fuzzy M-generalized semi homeomorphism (IFMGS homeomorphism in short) if f and f^{-1} are IFGS irresolute mappings.

Theorem 4.13: Every IFMGS homeomorphism is an IFGS homeomorphism but not conversely.

Proof: Let f: $(X, \tau) \rightarrow (Y, \sigma)$ be an IFMGS homeomorphism. Let B be IFCS in Y. This implies B is an IFGSCS in Y. By hypothesis $f^{-1}(B)$ is an IFGSCS in X. Hence f is an IFGS continuous mapping. Similarly we can prove f^{-1} is an IFGS continuous mapping. Hence f and f^{-1} are IFGS continuous mappings. This implies the mapping f is an IFGS homeomorphism.

Example 4.14: Let X = {a, b}, Y = {u, v} and $T_1 = \langle$ x, (0.3, 0.4), (0.6, 0.1) $\rangle$, $T_2 = \langle$ y, (0.2, 0.1), (0.5, 0.5) $\rangle$. Then $\tau = \{0_\sim, T_1, 1_\sim\}$ and $\sigma = \{0_\sim, T_2, 1_\sim\}$ are IFTs on X and Y respectively. Define a bijection mapping f: $(X, \tau) \rightarrow (Y, \sigma)$ by f(a) = u and f(b) = v. Then f is an IFGS homeomorphism. Let us consider an IFS G = $\langle$ y, (0.3, 0.2), (0.7, 0.7) $\rangle$ in Y. Clearly G is an IFGSCS in Y. But $f^{-1}(G) = \langle$ x, (0.3, 0.2), (0.7, 0.7) $\rangle$ is not an IFGSCS in X. That is f is not an IFGS irresolute mapping. Hence f is not an IFMαG homeomorphism.

Theorem 4.15: If f: $X \rightarrow Y$ is an IFMGS homeomorphism, then $scl(f^{-1}(B)) = f^{-1}(scl(B))$ for every IFS B in Y.

Proof: Since f is an IFMGS homeomorphism, f is an IFGS irresolute mapping. Consider an IFS B in Y. Clearly scl(B) is an IFSCS in Y. This implies scl(B) is an IFGSCS in Y. By hypothesis $f^{-1}(scl(B))$ is an IFGSCS in X. Since $f^{-1}(B) \subseteq f^{-1}(scl(B))$, $scl(f^{-1}(B)) \subseteq scl(f^{-1}(scl(B))) = f^{-1}(scl(B)))$. This implies $scl(f^{-1}(B)) \subseteq f^{-1}(scl(B))$. Since f is an IFMGS homeomorphism, f^{-1}: $Y \rightarrow X$ is an IFGS irresolute mapping. Consider an IFS $f^{-1}(B)$ in X. Clearly $scl(f^{-1}(B))$ is an IFGSCS in X. This implies $(f^{-1})^{-1}(scl(f^{-1}(B))) = f(scl(f^{-1}(B)))$ is an IFGSCS in Y. Clearly $B = (f^{-1})^{-1}(f^{-1}(B)) \subseteq (f^{-1})^{-1}(scl(f^{-1}(B))) = f(scl(f^{-1}(B)))$,. Therefore $scl(B) \subseteq scl(f(scl(f^{-1}(B)))) = f(scl(f^{-1}(B))$, since f^{-1} is an IFGS irresolute mapping. Hence $f^{-1}(scl(B)) \subseteq f^{-1}(f(scl(f^{-1}(B)) = scl(f^{-1}(B))$. That is $f^{-1}(scl(B)) \subseteq scl(f^{-1}(B))$. This implies $scl(f^{-1}(B)) = f^{-1}(scl(B))$.

5. CONCLUSION

In this paper I have introduced intuitionistic fuzzy generalized semi closed mappings, Intuitionistic fuzzy generalized semi homeomorphisms and studied some of its properties. Also I have provided some characterizations of intuitionistic fuzzy generalized semi homeomorphisms.

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