ISSN: 0974-5823 Vol. 6 No. 3 December, 2021

International Journal of Mechanical Engineering

Contra Soft JA continuous functions

S. Jackson[1] S.Amulya Cyril Raj[2]

1. Assistant Professor P.G.&Research Department of Mathematics,

V.O.Chidambaram College, Thoothukudi, India-628008.

Affliated to Manonmaniam Sundaranar university, Tirunelveli 627012

2. Research Scholar (Reg.No:19112232091006), P.G.&Research Department of Mathematics,

V.O.Chidambaram College, Thoothukudi, India-628008.

Affliated to Manonmaniam Sundaranar university, Tirunelveli 627012

Abstract:

Molodtsov initiated the concept of soft sets in [1]. Maji et al. defined some operations on soft sets in [2]. The concept of soft topological space was introduced by some authors. Contra soft JA continuous maps, a weaker type of contra soft continuous maps, are observed and investigated in brief.

AMS subject classifications: 06d72, 51A05

Key words and phrases: Contra Soft JA continuous functions, Contra soft JA closed, Strongly soft JA closed.

1. INTRODUCTION:

In 1999, Russian Mathematician D.Molodstov [3] stipulated soft set theory to eradicate the vagueness that arises in the most of the problem solving methods. The concept of soft sets became more stable after Shabir and Naz[6] introduced soft topological spaces in 2011, which are defined over an initial universe with a fixed set of parameters. They studied some basic concepts of soft topological spaces also some related concepts such as soft interior, soft closure, soft subspace and soft separation axioms. Afterwards many researchers contributed towards soft set theory and soft topological spaces. K. Kannan (2012) [2] studied soft generalized closed sets, Chen.B(2013) [1] contributed soft semi open sets, A.Kalai Selvi and T.Nandhini etal.(2014) [4] introduced soft $\hat{g}$-closed sets in soft topological spaces along with its properties. In 2016,S.Jackson and S.Pious missier [5] paved a new pathway by introducing a new class of generalized closed set called soft JP closed sets in soft topological spaces. In this paper Contra soft JA continuous maps, a weaker type of contra soft continuous maps, are observed and investigated in brief.

2. PRELIMINARIES

Definition 2.1 :

Let τ be a collection of soft sets over X with the fixed set E of parameters. Then τ is called a Soft Topology on X if

i. $\tilde{\phi}, \tilde{X}$ belongs to τ.

ii. The union of any number of soft sets in τ belongs to τ.

iii. The intersection of any two soft sets in τ belongs to τ.

The triplet (X, τ, E) is called Soft Topological Space over X. The members of τ are called Soft Open sets in X and complements of them are called Soft Closed sets in X.

Definition 2.2. A map $f : (X, \tau, E) \to (Y, \sigma, K)$ is said to be Soft JA closed if the image of every soft closed set of (X, τ, E) is Soft JA closed in (Y, σ, K).

Definition 2.3. A function $f : (X, \tau, E) \to (Y, \sigma, K)$ is called Soft JA* closed if the image of each Soft JA closed set of X is Soft JA closed in Y.

Definition 2.4: A map $f : (X, \tau, E) \to (Y, \sigma, K)$ is said to be Soft JA continuous if inverse image of every Soft closed set in (Y, σ, K) is Soft JA closed in (X, τ, E) .

Definition 2.5. A function $f: (X, \tau, E) \to (Y, \sigma, K)$ is called contra soft JA irresolute if $f^{-1}(V)$ is soft JA closed in (X, τ, E) for every soft JA open subset (V, K) of (Y, σ, R).

Definition 2.6. A function $f: (X, \tau, E) \to (Y, \sigma, K)$ is called completely soft JA irresolute if $f^{-1}(V)$ is soft regular open in (X, τ, E) for every soft JA open subset (V, K) of (Y, σ, K).

3.Contra Soft JA continuous functions:

Definition 3.1. A function $f: (X, \tau, E) \to (Y, \sigma, K)$ is regarded as contra soft JA continuous if $f^{-1}(F)$ is soft JA open (resp . soft JA closed) in (X, τ, E) for every soft closed (resp. soft open) set F in (Y, σ, K).

Theorem 3.2. Every JA continuous function is a JA continuous function that is contra soft.

Proof. Let $f: (X, \tau, E) \to (Y, \sigma, K)$ be a soft contra continuous function. Let V be an soft open set of (Y, σ, K). As f is contra soft continuous, $f^{-1}(V)$ is soft closed in (X, τ, E) .Therefore by theorem 2.2.2. $f^{-1} - (V)$ is soft JA closed in (X, τ, E) .Therefore, f is a contra soft JA continuous function.

Remark 3.3. The authenticity of the converse of this theorem is proved to be false, as portrayed in the following example:

Example 3.4. $X = \{x_1, x_2\}$, $Y = \{y_1, y_2\}$, $E = \{e_1, e_2\}$, $K = \{k_1 k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi, \tilde{X}, (F_1, E), (F_2, E), (F_3, E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2) = \{ x_1\}$, $F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$ and $\sigma = \{\{\phi, \tilde{Y}, (H, K)\}$ where $H(k_1) = \phi, H(k_2) = \{y_2\}$, let $f: (X, \tau, E) \to (Y, \sigma, K)$ is a soft mapping then (H,K) is soft set in (Y, σ, K), here

$f^{-1}(H,K) = \{(e_1,\{x_1\}),(e_2,\phi)\}$is soft JA closed set but not soft closed set. Hence the soft mapping f is soft JA continuous but not soft continuous.

Remark 3.5. The independent nature of contra soft JA continuous and contra soft g-continuous is depicted, as in the following example:

Example 3.6. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E),(F_3,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2)=\{x_1\}, F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$and $\sigma = \{\{\phi,\widetilde{Y},(A,K)\}$ where $A(k_1) = \phi, A(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (A,K) is soft set in (Y,σ,K), here $f^{-1}(A,K) = \{(e_1,\{x_1\}),(e_2,\phi)\}$ is soft pre semi closed but not soft JA closed in (X,τ,E).

Example 3.7. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_1$, $p(x_2) = y_2$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2)=\{\phi\}$, and $\sigma = \{\{\phi,\widetilde{Y},(A,K)\}$ where $A(k_1) = \{y_1\}, A(k_2) = Y$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (A,K) is soft set in (Y,σ,K), here $f^{-1}(A,K) = \{(e_1,\{X\}),(e_2,\{x_1\})\}$is soft gpr closed set but not soft JA closed.

Remark 3.8. The independent nature of contra soft JA continuous and contra soft α-continuous are portrayed through the following example:

Example 3.9. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_1$, $p(x_2) = y_2$ and $q(e_1) = k_1, q(e_2) = k_2$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2)=\{x_1\}, F_2(e_1) = \{x_1\}$, $F_2(e_2) = X$ and $\sigma = \{\{\phi,\widetilde{Y},(A,K)\}$ where $A(k_1) = \phi, A(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (A,K) is soft set in (Y,σ,K), here $f^{-1}(A,K) = \{(e_1,\{x_1\}),(e_2,x_2)\}$ is soft JA closed but neither soft semi closed nor soft semi pre closed.

Example 3.10. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E),(F_3,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2)=\{x_1\}, F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$and $\sigma = \{\{\phi,\widetilde{Y},(A,K)\}$ where $A(k_1) = \phi, A(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (A,K) is soft set in (Y,σ,K), here $f^{-1}(A,K) = \{(e_1,\{x_1\}),(e_2,\phi)\}$ is soft pre semi closed but not soft JA closed in (X,τ,E).

Remark 3.11. The independent state of Contra soft JA continuous and contra soft pre-continuous are depicted through the following examples:

Example 3.12. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_1, q(e_2) = k_2$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E),(F_3,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2)=\{x_1\}, F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$and $\sigma = \{\{\phi,\widetilde{Y},(A,K)\}$ where $A(k_1) = \phi, A(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (A,K) is soft set in (Y,σ,K), here $f^{-1}(A,K) = \{(e_1,\{x_1\}),(e_2,\phi)\}$is soft g closed set but not soft JA closed set.

Example 3.13. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_1, q(e_2) = k_2$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F,E)\}$ such that $F(e_1) = \{X\}, F(e_2)=\{\phi\}, F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$and $\sigma = \{\{\phi,\widetilde{Y},(A,K)\}$ where $A(k_1) = Y, A(k_2) = \{\phi\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (A,K) is soft set in (Y,σ,K), here $f^{-1}(A,K) = \{(e_1,\{x_2\}),(e_2,\phi)\}$is soft p closed continuous set but not JA closed set.

Remark 3.14. contra soft JA continuous and contra soft semi-continuous are independent. It is shown by the following example:

Example:3.15. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E),(F_3,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2) = \{x_1\}$, $F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$ and $\sigma = \{\{\phi,\widetilde{Y},(H,K)\}$ where $H(k_1) = \phi, H(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is soft closed map but not perfectly soft JA closed map.

Example:3.16. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E),(F_3,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2) = \{x_1\}$, $F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$ and $\sigma = \{\{\phi,\widetilde{Y},(H,K)\}$ where $H(k_1) = \phi, H(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is soft closed map but not perfectly soft JA closed map.

Remark 3.17. The arrangement of two contra soft JA continuous functions need not to be contra soft JA continuous as depicted through the example:

Example 3.18. $X = \{x_1,x_2\}$, $Y = \{y_1,y_2\}$, $E = \{e_1,e_2\}$, $K = \{k_1k_2\}$, define $p: X \to Y$ and $q: E \to K$ as $p(x_1) = y_2$, $p(x_2) = y_1$ and $q(e_1) = k_2, q(e_2) = k_1$. Let us consider the soft topology $\tau = \{\phi,\widetilde{X},(F_1,E),(F_2,E),(F_3,E)\}$ such that $F_1(e_1) = \{x_1\}, F_1(e_2) = \{x_1\}$, $F_2(e_1) = \{x_1\}$, $F_2(e_2) = X, F_3(e_1) = X, F_3(e_2) = \{x_2\}$ and $\sigma = \{\{\phi,\widetilde{Y},(H,K)\}$ where $H(k_1) = \phi, H(k_2) = \{y_2\}$, let $f: (X,\tau,E) \to (Y,\sigma,K)$ is a soft mapping then (H,K) is soft set in (Y,σ,K), here $f^{-1}(H,K) = \{(e_1,\{x_1\}),(e_2,\phi)\}$is soft JA closed set but not soft closed set. Hence the soft mapping f is soft JA continuous but not soft continuous.

Theorem 3.19. The following are proportionate for the function $f: (X,\tau,E) \to (Y,\sigma,K)$ Presume that DO(X) (resp. DC(X)) is soft closed under any union (resp. intersection).

1. f is contra soft JA continuous.
2. For inverse image of a soft closed set F of Y is soft JA open in X.
3. For each $x \in X$ and each $F \in C(Y,f(x))$,there exists $U \in DO(X,x)$ such that $f(U) \subseteq F$.
4. $f(JA - cl(A)) \subseteq Ker(f(A))$ for every subset A of X.
5. $JA - cl(f^{-1}(B)) \subseteq f^{-1}(Ker(B))$ for every subset B of Y.

Proof. The implication $(1) \Longrightarrow (2) \Longrightarrow, (2) \Longrightarrow (3)$ are noticeable$(3) \Longrightarrow (2)$ Let F be any soft closed set of Y and $x \in f^{-1}(F)$. Then $f(x) \in F$and there remain $U_x \in DO(X, x)$ such that $f(U_x) \subset F$. Hence $f^{-1}(F) = \cup \{U_c : x \in f^{-1}(F)\}$ is obtained and by assumption$f^{-1}(F)$ is soft JA open.

(2)⟹(4) Let A be any subset of X. Presume that $y \notin Ker(f(A))$. Therefore by lemma 1.1.8, there remain $F \notin C(X, x)$ such that $f(a) \cap F = \emptyset$. Thus$A \cap f^{-1}(F) = \emptyset$ and $JA - cl(A) \cap f^{-1}(F) = \emptyset$. Hence $f(JA - cl(A)) \cap F = \emptyset$ and $y \notin f(d - cl(A))$are obtained. Thus $f(JA - cl(A)) \subseteq Ker(f(A))$.

(4)⟹ (5) let B be any soft subset of Y. By (4) and lemma 1.1.8,$f(JA - cl(f^{-1}(B))) \subset Ker(f(f^{-1}(B)) \subset Ker(B)$ and $JA - cl(f^{-1}(B)) \subset f^{-1}(Ker(B))$.

(5)⟹(1) Let U be any open set of Y. By (4) and lemma 1.1.8, $JA - cl(f^{-1}(U)) \subset f^{-1}(Ker(U) = f^{-1}(U)$ and $JA - cl(f^{-1}(U)) = f^{-1}(U)$. By assumption,$f^{-1}(U)$ is soft JA closed in X. Hence f is contra soft JA continuous.

Theorem 3.20 If $f: (X, \tau, E) \rightarrow Y, \sigma, K)$is soft JA irresolute (resp. contra soft JA continuous) and $g: (Y, \sigma, K) \rightarrow (Z, \eta, R)$ in a contra soft JA continuous (resp. soft continuous) then their formation $g \circ f: (X, \tau, E) \rightarrow (Z, \eta, R)$is contra soft JA continuous.

Proof. Let U be any set of (Z, η, R). For g is contra soft JA continuous (resp. soft continuous) then $g^{-1}(V)$ is soft JA continuous (resp. soft open) in (Y, σ, K) and after all, f id soft JA continuous (resp. contra soft JA continuous) then$f^{-1}(g^{-1}(V))$ is soft JA closed in(X, τ, E).hence $g \circ f$is contra soft JA continuous.

Theorem 3.21. If $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ is contra continuous and $g: (Y, \sigma, K) \rightarrow (Z, \eta, R)$ is soft continuous then their composition $g \circ f: (X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft JA continuous.

Proof. Let U be any soft open set of (Z, η, R). For g is soft continuous, $g^{-1}(U)$ is soft open in (Y, σ, K).For f is contra soft continuous$f^{-1}(g^{-1}(U))$ is soft closed in (X, τ, E). Hence by theorem 2.2.2, $(g \circ f)^{-1} \rightarrow (U)$ is soft JA closed in (X, τ, E). Hence g o f is contra soft JA continuous.

Theorem 3.22. If $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ is contra soft continuous and soft super-continuous and $g: (Y, \sigma, K) \rightarrow (Z, \eta)$ is contra soft continuous then their composition gof: $(X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft JA continuous.

Proof. Let U be any soft open set of (Z, η, R). Considering g as contra soft continuous, $g^{-1}(U)$ is soft closed in (Y, σ, K) and since f is contra soft continuous and soft super continuous then $f^{-1}(g^{-1}(U))$ is both soft open and soft regular closed in (X, τ, E). Therefore by theorem 2.3.17, $(g \circ f)^{-1} \rightarrow (U)$ is soft JA closed in (X, τ, E). For g o f is contra soft JA continuous.

Theorem 3.23. Let $(X, \tau, E), (Y, \sigma, R)$ be two soft topological spaces and (Y, σ, K) be $T_{1/2}$-space (resp.T_ω -space). Then the composition $g \circ f: (X, \tau, E) \rightarrow (Z, \eta, R)$ of contra soft JA continuous function $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ and the soft g continuous (resp. soft ω-continuous) function $g: (Y, \sigma, K) \rightarrow (Z, \eta, R)$ is contra soft JA continuous.

Proof. Consider F be any soft closed set of (Z, η, R). For g is soft g-continuous (resp. soft ω-continuous), g^{-1} (F) is soft g-closed (resp. soft ω-closed) in (Y, σ, K) and (Y, σ, K) is $T_{1/2}$-space (resp. T_ω-space), hence $g^{-1}(F)$ is soft closed in (Y, σ, K). Since f is contra soft JA continuous, $f^{-1}(g^{-1}(F))$ is soft JA open in (X, τ, E). Hence g o f is contra soft JA continuous.

Theorem 3.24. If $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ is a surjective soft JA open function and $g: (Y, \sigma, K) - (Z, \eta, R)$ is a function such that $g \circ f: (X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft JA continuous then g is contra soft JA continuous.

Proof. Consider F be any soft closed set of (Z, η, R). Since gof is contra soft JA continuous then $(g \circ f)^{-1}(F) = f^{-1}(g^{-1}(F))$ is soft JA open in (X, τ, E) and since f is surjective and soft JA open, then $f\left(f^{-1}(g^{-1}(F))\right) = g^{-1}(F)$ is soft JA open in (Y, σ, K). Hence g is contra soft JA continuous.

Theorem 3.25. Let $\{X_i / i \in I\}$ be any family of soft topological spaces. If $f: X \rightarrow \Pi X_i$, is a contra soft JA continuous function. Then $\pi_i$of: $X \rightarrow X_i$ is contra soft JA continuous function for each $i \in I$, where π_i is the projection of ΠX_i, onto X_i

Theorem 3.26. If $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ is strongly soft JA continuous and $g: (Y, \sigma, K) \rightarrow (Z, \eta, R)$ is contra soft JA continuous then gof: $(X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft continuous.

Proof. Let U be any soft open set of(Z, η, R). Since g is contra soft JA continuous, then g(U) is soft JA closed in (Y, σ, K). Since f is strongly soft JA continuous then $f^{-1}(g^{-1}(U)) = (gof)^{-1}(U)$is soft closed in$(X, \tau, E)$ .Hence gof is contra soft continuous.

Theorem 3.27. If $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$is pre soft JA continuous and $g: (Y, \sigma, K) \rightarrow (Z, \eta, R)$ is contra soft pre-continuous then gof: $(X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft JA continuous.

Proof. Let U be any soft open set of (Z, η, R) .Since g is contra soft pre continuous, then $g^{-1}(U)$is soft pre-closed in (Y, σ, K) and since f is pre soft JA continuous, $f^{-1}(g^{-1}(U)) = (gof)^{-1}(U)$ is soft JA closed in (X, τ, E).Hence gof is contra soft JA continuous.

Theorem 3.28. If $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ is strongly soft JA continuous and $g: (Y, \sigma, K) \rightarrow (Z, \eta, R)$ is contra soft JA continuous then gof: $(X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft JA continuous.

Proof. Consider U be any soft open set of (Z, η, R). For g is contra soft JA continuous, $g^{-1}(U)$ is soft JA closed in (Y, σ, K) and since it is evidently soft JA continuous, $f^{-1}(g^{-1}(U)) = (gof)^{-1}(U)$is soft closed in$(X, \tau, E)$. By theorem 2.2.2, $(gof)^{-1}(U)$ is soft JA closed in (X, τ, E). Therefore gof is contra soft JA continuous.

Theorem 3.29. Let $f: (X, \tau, E) \rightarrow (Y, \sigma, K)$ be surjective soft JA irresolute and soft JA open and $g: (Y, \sigma, K) \rightarrow (Z, \eta)$ be any function. Then gof: $(X, \tau, E) \rightarrow (Z, \eta, R)$ is contra soft JA continuous if and only if g is contra soft JA continuous

Proof. The 'if' strip is easy to confirm. To verify the only if part, let F be any soft closed set of (Z, η, R). Shine go f is contra soft JA continuous, then $(gof)^{-1}(F)$is soft JA open in (X, τ, E) and since f is soft JA open surjection, then $f(gof)^{-1}(F)) = g^{-1}(F)$ is soft JA open in (Y, σ, K) .Hence g is contra soft JA continuous

Theorem 3.30. For $f:(X,\tau,E)\rightarrow(Y,\sigma,K)$ v be a contra soft JA continuous function and H an open soft JA closed subset of (X,τ,E). Presume that $DC(X,\tau,E)$ (the class of all soft JA closed sets of (X,τ,E), is soft JA closed under limited intersections. Then the restriction $f\,H:(H,_{\tau H})\rightarrow(Y,\sigma,K)$ is contra soft JA continuous.

Proof. Let U be any soft open set of (Y,σ,K). By proposition and suppositions $,f^{-1}(U)\cap H=H_1$. (say) is soft JA closed in (X,τ,E). Since, $fH^{-1}(U)=H_1$ it is acceptable to portray that H_1 is soft JA closed in H. By theorem 3.3.20, H is soft JA closed in H. Thus f H is contra soft JA continuous.

Theorem 3.31. Let $f:(X,\tau,E)\rightarrow(Y,\sigma,K)$ be a function and $g: X\rightarrow X\times Y$ the graph function given by $g(x)=(x,f(x))$ for every $x\in X$. Then f is contra soft JA continuous if g is contra soft JA continuous.

Proof. Suppose F be a soft closed subset of Y. Then $X\times F$ is a soft closed subset of $X\times Y$. Since g is contra soft JA continuous, then $g^{-1}(X\times F)$ is a soft JA open subset of X. Also $g^{-1}(X\times F)=f^{-1}(F)$. Hence f is contra soft JA continuous

Theorem 3.32. If a function $f:(X,\tau,E)\rightarrow(Y,\sigma,K)$ is contra soft JA continuous and Y is soft regular, then f is soft JA continuous.

Proof. Let x be an random point of X and N be an soft open set of Y containing f(x). Since Y is soft regular, there exists an soft open set U in Y containing f(x) such that $cl(U)\subseteq N$. For f is contra soft JA continuous, by theorem 6.2.20, there exists $W\in DO(X,x)$ such that $f(W)\subseteq cl(U)$. Then $f(W)\subseteq N$. Therefore by theorem 3.3.15, f is soft JA continuous.

Theorem 3.33. Totality of soft continuous and soft regular closed continuous function is contra soft JA continuous.

Proof. Let $f:(X,\tau,E)\rightarrow(Y,\sigma,K)$ be a function. Let U be an soft open set of (Y,σ,K) be. Since f is soft continuous and soft regular closed continuous, $f^{-1}(U)$ is soft open and soft regular closed in (X,τ,E). Hence by theorem 2.3.17, f is contra soft JA continuous

Theorem 3.34. All soft continuous and contra soft JA continuous (resp. soft contra continuous and soft JA continuous) function is a soft super-continuous (resp. soft Regular closed continuous) function.

Proof. Consider $f:(X,\tau,E)\rightarrow(Y,\sigma,K)$ be a function. Let U be an soft open (resp. soft closed) set of (Y,σ,K). Since f is soft continuous and contra soft JA continuous(resp. contra soft continuous and soft JA continuous), $f^{-1}(U)$ is soft open and soft JA closed in (X,τ,E).Hence by theorem 2.3.24, $f^{-1}(U)$ is soft regular open in (X,τ,E). This shows that f is a soft super-continuous (resp. soft regular closed continuous) function.

Theorem 3.35. Let $f:(X,\tau,E)\rightarrow(Y,\sigma,K)$ be a function and X a $JA-T_s$, space. Then, the subsequent forms are identical.

1. f is contra soft JA continuous.

2. f is contra soft continuous

Proof. (1) $\Rightarrow$ 2). For U be an soft open set of (Y,σ,K).Let f is contra soft JA continuous, $f^{-1}(U)$ is soft JA closed in (X,τ,E) and since X is $JA-T_s$, ,space, (2) $\Rightarrow$ (1) For U be an soft open set of (Y,σ,K)..For f is soft contra continuous, $f^{-1}(U)$ is soft closed in (X,τ,E).Therefore by theorem 2.2.2, $f^{-1}(U)$ is soft JA closed in (X,τ,E).Is f is contra soft JA continuous.

$f^{-1}(U)$ is soft closed in (X,τ,E). Hence f is contra soft continuous.

REFERENCES:

[1]Bin chen., "Soft Semi-Open Sets And Related Properties In Soft Topological Spaces", Appl. math. Inf. Sci., Vol. 7, pp. 287-294, 2013.

[2]K.Kannan,, "Soft Generalized closed sets in Soft Topological Spaces", Journal of theoretical and applied information technology, vol 37, pp.17-20,2012.

[3]D.Molodtsov,"Soft Set Theory First Results.", Compu. Math. Appl., Vol. 37,pp. 19-31, 1999.

[4]Nandhini.T.,Kalaiselvi.A., "Soft $\hat{g}$ closed sets in Soft Topological Spaces",International Journal of Innovative Research in Science, Engineering and Technology, Vol 3, issue 7,pp.14595-14600,2014.

[5]S.Pious Missier and S.Jackson, "A New notion of Generalized Closed sets in soft topological Spaces.", Indian Journal of Mathematical Archive: Volume 7 Issue 8 PP 37-44.

[6]M.Shabir and M.Naz, "On Soft topological spaces.",Comput. Math. Appl., Vol. 61, pp. 1786-1799, 2011.