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New Ideas in Recognition of Cancer and Neutrosophic Super Hyper Graph by Eulerian-Path-Cut as Hyper Eulogy-Path-Cut on Super EULA-Path-Cut

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Abstract

In this scientific research, some extreme notions and Neutrosophic notions are defined on the family of SuperHyperGraphs and Neutrosophic SuperHyperGraphs. Some well-known classes are used in this scientific research. A basic familiarity with Neutrosophic SuperHyper Eulerian-Path-Cut theory, SuperHyperGraphs, and Neutrosophic SuperHyperGraphs theory are proposed.

Keywords: *Neutrosophic super hyper graph, Super hyper Eulerian-Path-Cut, Cancer's neutrosophic recognition*

1. Neutrosophic Preliminaries of this Scientific Research on the Redeemed Ways

In this section, the basic material in this scientific research, is referred to [Single Valued Neutrosophic Set] ((Henry, 2023), Definition 2.2, p. 2), [Neutrosophic Set] ((Henry, 2023), Definition 1.1, p. 1), [Neutrosophic SuperHyperGraph (NSHG)] ((Henry, 2023), Definition 2.5, p. 2), [Characterization of the Neutrosophic SuperHyperGraph (NSHG)] ((Henry, 2023), Definition 2.7, p. 3), [t-norm]((Henry, 2023), Definition 2.7, p. 3), and [Characterization of the Neutrosophic SuperHyperGraph (NSHG)] ((Henry, 2023), Definition 2.7, p. 3), [Neutrosophic Strength of the Neutrosophic SuperHyperPaths] ((Henry, 2023), Definition 5.3, p. 7), and [Different Neutrosophic Types of Neutrosophic SuperHyperEdges (NSHE)] ((Henry, 2023), Definition 5.4, p. 7). Also, the new ideas and their clarifications are addressed to Henry (2023).

Definition 1.1

Different Neutrosophic Types of Neutrosophic SuperHyperEulerian-Path-Cut

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider a Neutrosophic SuperHyperSet $V = V_1, V_2, ..., V_s$ and $E = E_1, E_2, ..., E_z$. Then either V' or E' is called

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(i) Neutrosophic e-SuperHyperEulerian-Path-Cut if the following expression is called Neutrosophic e-SuperHyperEulerian-Path-Cut criteria holds

$\forall E_a \in P : P$ is a SuperHyperPath and it has all number of SuperHyperEdges;

(ii) Neutrosophic re-SuperHyperEulerian-Path-Cut if the following expression is called Neutrosophic re-SuperHyperEulerian-Path-Cut criteria holds:

$\forall E_a \in P : P$ is a SuperHyperPath and it has the all number of SuperHyperEdges;

and $|E_i|_{\text{NEUTROSOPIC CARDINALITY}} = |E_j|_{\text{NEUTROSOPIC CARDINALITY}}$;

(iii) Neutrosophic v-SuperHyperEulerian-Path-Cut if the following expression is called Neutrosophic v-SuperHyperEulerian-Path-Cut criteria holds:

$\forall V_a \in P : P$ is a SuperHyperPath and it has the all number of SuperHyperEdges;

(iv) Neutrosophic rv-SuperHyperEulerian-Path-Cut if the following expression is called Neutrosophic v-SuperHyperEulerian-Path-Cut criteria holds:

$\forall V_a \in P : P$ is a SuperHyperPath and it has the all number of SuperHyperEdges;

and $|V_i|_{\text{NEUTROSOPIC CARDINALITY}} = |V_j|_{\text{NEUTROSOPIC CARDINALITY}}$;

(v) Neutrosophic SuperHyperEulerian-Path-Cut if it's either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut.

Definition 1.2

(Neutrosophic) SuperHyperEulerian-Path-Cut

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider a Neutrosophic SuperHyperEdge (NSHE) $E = \{V_1, V_2, \ldots, V_s\}$. Then E is called

(i) An Extreme SuperHyperEulerian-Path-Cut if it is either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and ($NSHG$) for an Extreme SuperHyperGraph $NSHG : (V, E)$ is the maximum Extreme cardinality of an Extreme SuperHyperSet S of high Extreme cardinality of the Extreme SuperHyperEdges in the conseNeighborive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperEulerian-Path-Cut;

(ii) A Neutrosophic SuperHyperEulerian-Path-Cut if it's either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and ($NSHG$) for a Neutrosophic SuperHyperGraph $NSHG : (V, E)$ is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet S of high Neutrosophic cardinality conseNeighborive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperEulerian-Path-Cut;

(iii) An Extreme SuperHyperEulerian-Path-Cut SuperHyperPolynomial if it is either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and ($NSHG$) for an Extreme SuperHyperGraph $NSHG : (V, E)$ is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperEdges of an Extreme SuperHyperSet S of high Extreme cardinality conseNeighborive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperEulerian-Path-Cut; and the Extreme power is corresponded to its Extreme coefficient;

(iv) A Neutrosophic SuperHyperEulerian-Path-Cut SuperHyperPolynomial if it is either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and ($NSHG$) for a Neutrosophic

SuperHyperGraph $NSHG : (V, E)$ is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperEdges of a Neutrosophic SuperHyperSet S of high Neutrosophic cardinality conseNeighborive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperEulerian-Path-Cut; and the Neutrosophic power is corresponded to its Neutrosophic coefficient;

(v) An Extreme V-SuperHyperEulerian-Path-Cut if it is either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and $(NSHG)$ for an Extreme SuperHyperGraph $NSHG : (V, E)$ is the maximum Extreme cardinality of an Extreme SuperHyperSet S of high Extreme cardinality of the Extreme SuperHyperVertices in the conseNeighborive Extreme sequence of Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperEulerian-Path-Cut;

(vi) A Neutrosophic V-SuperHyperEulerian-Path-Cut if it is either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and $(NSHG)$ for a Neutrosophic SuperHyperGraph $NSHG : (V, E)$ is the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet S of high Neutrosophic cardinality conseNeighborive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperEulerian-Path-Cut;

(vii) An Extreme V-SuperHyperEulerian-Path-Cut SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and $(NSHG)$ for an Extreme SuperHyperGraph $NSHG : (V, E)$ is the Extreme SuperHyperPolynomial contains the Extreme coefficients defined as the Extreme number of the maximum Extreme cardinality of the Extreme SuperHyperVertices of an Extreme SuperHyperSet S of high Extreme cardinality conseNeighborive Extreme SuperHyperEdges and Extreme SuperHyperVertices such that they form the Extreme SuperHyperEulerian-Path-Cut; and the Extreme power is corresponded to its Extreme coefficient;

(viii) A Neutrosophic SuperHyperEulerian-Path-Cut SuperHyperPolynomial if it's either of Neutrosophic e-SuperHyperEulerian-Path-Cut, Neutrosophic re-SuperHyperEulerian-Path-Cut, Neutrosophic v-SuperHyperEulerian-Path-Cut, and Neutrosophic rv-SuperHyperEulerian-Path-Cut and $(NSHG)$ for a Neutrosophic SuperHyperGraph $NSHG : (V, E)$ is the Neutrosophic SuperHyperPolynomial contains the Neutrosophic coefficients defined as the Neutrosophic number of the maximum Neutrosophic cardinality of the Neutrosophic SuperHyperVertices of a Neutrosophic SuperHyperSet S of high Neutrosophic cardinality conseNeighborive Neutrosophic SuperHyperEdges and Neutrosophic SuperHyperVertices such that they form the Neutrosophic SuperHyperEulerian-Path-Cut; and the Neutrosophic power is corresponded to its Neutrosophic coefficient.

2. Neutrosophic SuperHyperEulerian-Path-Cut but as the Extensions Excerpt from Dense and Super Forms

Definition 2.1.: Neutrosophic Event

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Any Neutrosophic k-subset of A of V is called Neutrosophic k-event and if $k = 2$, then Neutrosophic subset of A of V is called Neutrosophic event. The following expression is called Neutrosophic probability of A.

$$E(A) = \sum_{a \in A} E(a) \quad ...(1)$$

Definition 2.2.: Neutrosophic Independent

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. s Neutrosophic k-events A_i, $i \in I$ is called Neutrosophic s-independent if the following expression is called Neutrosophic s-independent criteria

$$E\left(\bigcap_{i \in I} A_i\right) = \prod_{i \in I} P(A_i)$$

And if $s = 2$, then Neutrosophic k-events of A and B is called Neutrosophic independent. The following expression is called Neutrosophic independent criteria

$$E(A \cap B) = P(A)P(B) \qquad ...(2)$$

Definition 2.3.: Neutrosophic Variable

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Any k-function Eulerian-Path-Cut like E is called Neutrosophic k-Variable. If $k = 2$, then any 2-function Eulerian-Path-Cut like E is called Neutrosophic Variable.

The notion of independent on Neutrosophic Variable is likewise.

Definition 2.4.: Neutrosophic Expectation

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. A Neutrosophic k-Variable E has a number is called Neutrosophic Expectation if the following expression is called Neutrosophic Expectation criteria.

$$Ex(E)\sum_{a \in V} E(\alpha)P(\alpha)$$

Definition 2.5.: Neutrosophic Crossing

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. A Neutrosophic number is called Neutrosophic Crossing if the following expression is called Neutrosophic Crossing criteria

$Cr(S) = \min\{\text{Number of Crossing in a Plane Embedding of } S\}$.

Lemma 2.6.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let m and n propose special Eulerian-Path-Cut. Then with $m \geq 4n$.

Proof: Consider a planar embedding G of G with $cr(G)$ crossings. Let S be a Neutrosophic random k-subset of V obtained by choosing each SuperHyperVertex of G Neutrosophic independently with probability Eulerian-Path-Cut $p := 4n/m$, and set $H := G[S]$ and $H := G[S]$.

Define random variables X, Y, Z on V as follows: X is the Neutrosophic number of SuperHyperVertices, Y is the Neutrosophic number of SuperHyperEdges, and Z is the Neutrosophic number of crossings of H. The trivial bound noted above, when applied to H, yields the inequality $Z \geq cr(H) \geq Y - 3X$. By linearity of Neutrosophic Expectation,

$E(Z) \geq E(Y) - 3E(X)$.

Now $E(X) = pn$, $E(Y) = p^2m$ (each SuperHyperEdge having some SuperHyperEnds) and $E(Z) = p^4cr(G)$ (each crossing being defined by some SuperHyperVertices). Hence

$p^4cr(G) \geq p^2m - 3pn$

Dividing both sides by p^4, we have:

$$cr(G) \geq \frac{pm - 3n}{p^3} = \frac{n}{(4n/m)^3} = \frac{1}{64}m^3n^2$$

Theorem 2.7.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let P be a SuperHyperSet of n points in the plane, and let l be the Neutrosophic number of SuperHyper Lines in the plane passing through at least $k + 1$ of these points, where $1 \leq k \leq 2, 2n$. Then $l < 32n^2/k^3$.

Proof: Form a Neutrosophic SuperHyperGraph G with SuperHyperVertex SuperHyperSet P whose SuperHyperEdge are the segments between conseNeighborive points on the SuperHyperLines which pass through at least $k + 1$ points of P. This Neutrosophic SuperHyperGraph has at least kl SuperHyperEdges and Neutrosophic crossing at most l choose two. Thus either $kl < 4n$, in which case $l < 4n/k \leq 32n^2/k^3$, or $l^2/2 > l$ choose $2 \geq cr(G) \leq (kl)^3/64n^2$ by the Neutrosophic Crossing Lemma, and again $l < 32n^2/k^3$.

Theorem 2.8.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let P be a SuperHyperSet of n points in the plane, and let k be the number of pairs of points of P at unit SuperHyperDistance. Then $k < 5n^{4/3}$.

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Draw a SuperHyperUnit SuperHyperCircle around each SuperHyperPoint of P. Let n_i be the Neutrosophic number of these SuperHyperCircles passing through exactly i points of P. Then

$$\sum i = 0^{n-1} n_i = n \text{ and } k = \frac{1}{2}\sum i = 0^{n-1} in_i$$

SuperHyperGraph H with SuperHyperVertex SuperHyperSet P whose SuperHyperEdges are the SuperHyperArcs between conseNeighborive SuperHyperPoints on the SuperHyperCircles that pass through at least three SuperHyperPoints of P. Then

$$e(H) = \sum_{i=3}^{n=1} in_i = 2k - n_1 - 2n_2 \geq 2k - 2n$$

Some SuperHyperPairs of SuperHyperVertices of H might be joined by some parallel SuperHyperEdges. Delete from H one of each SuperHyperPair of parallel SuperHyperEdges, so as to obtain a simple Neutrosophic SuperHyperGraph G with $e(G) \geq k - n$. Now $cr(G) \leq n(n - 1)$ because G is formed from at most n SuperHyperCircles, and any two SuperHyperCircles cross at most twice. Thus either $e(G) < 4n$, in which case $k < 5n < 5n^{4/3}$, or $n^2 > n(n - 1) \geq cr(G) \geq (k - n)^3/64n^2$ by the Neutrosophic Crossing Lemma, and $k < 4n^{4/3} + n < 5n^{4/3}$.

Proposition 2.9.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let X be a nonnegative Neutrosophic Variable and t a positive real number. Then

$$P(X \geq t) \leq \frac{E(X)}{t}$$

Proof:

$$E(X) = \sum\{X(a)P(a) : a \in V\} \geq \sum\{X(a)P(a) : a \in V, X(a) \geq t\}$$

$$\sum\{tP(a) : a \in V, X(a) \geq t\} = t$$

$$\sum\{P(a) : a \in V, X(a) \geq t\}$$

$$tP(X \geq t)$$

Dividing the first and last members by t yields the asserted inequality.

Corollary 2.10.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let X_n be a nonnegative integer-valued variable in a prob- ability Eulerian-Path-Cut (V_n, E_n), $n \geq 1$. If $E(X_n) \to 0$ as $n \to \infty$, then $P(X_n = 0) \to 1$ as $n \to \infty$.

Theorem 2.11.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair S = (V, E). Consider S = (V, E) is a probability Eulerian-Path-Cut. A special SuperHyperGraph in $G_{n,p}$ almost surely has stability number at most $[2p^{-1} \log n|$.

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. A special SuperHyperGraph in $G_{n,p}$ is up. Let $G \in G_{n,p}$ and let S be a given SuperHyperSet of $k + 1$ SuperHyperVertices of G, where $k \in N$. The probability that S is a stable SuperHyperSet of G is $(1 - p)^{(k+1)\text{choose}2}$, this being the probability that none of the $(k + 1)$choose2 pairs of SuperHyperVertices of S is a SuperHyperEdge of the Neutrosophic SuperHyperGraph G.

Let A_S denote the event that S is a stable SuperHyperSet of G, and let X_S denote the indicator Neutrosophic Variable for this Neutrosophic Event. By equation, we have

$$E(X_S) = P(X_S = 1) = P(A_S) = (1 - p)^{(k+1)\text{choose}2}$$

Let X be the number of stable SuperHyperSets of cardinality $k + 1$ in G. Then

$$X = \sum \{X_S : S \subseteq V, |S| = k + 1\}$$

and so, by those,

$$E(X) = \sum \{E(X_S) : S \subseteq V, |S| = k + 1\} = (n \ choose \ k + 1)(1 - p)^{(k+1)choose2}$$

We bound the right-hand side by invoking two elementary inequalities:

$$(n \ choose \ k + 1) \le \frac{n^{k+1}}{(k+1)!} \ and \ 1 - p \le e^{-p}$$

This yields the following upper bound on $E(X)$.

$$E(X) \le \frac{n^{k+1} e^{-p(k+1)choose2}}{(k+1)!} = \frac{ne^{-pk/2k+1}}{(k+1)!}$$

Suppose now that $k = [2p^{-1} \log n|$. Then $k \ge 2p^{-1} \log n$, so $ne^{-pk/2} \le 1$. Because k grows at least as fast as the logarithm of n, implies that $E(X) \to 0$ as $n \to \infty$. Because X is integer-valued and nonnegative, we deduce from Corollary that $P(X = 0) \to 1$ as $n \to \infty$. Consequently, a Neutrosophic SuperHyperGraph in $C_{n,p}$ almost surely has stability number at most k.

Definition 2.12.: Neutrosophic Variance

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. A Neutrosophic k-Variable E has a number is called Neutrosophic Variance if the following expression is called Neutrosophic Variance criteria.

$$Vx(E) = Ex((X - Ex(X))^2).$$

Theorem 2.13.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair S = (V, E). Consider S = (V, E) is a probability Eulerian-Path-Cut. Let X be a Neutrosophic Variable and let t be a positive real number. Then

$$E(|X - Ex(X)| \ge t) \le \frac{V(X)}{t^2}$$

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let X be a Neutrosophic Variable and let t be a positive real number. Then

$$E(|X - Ex(X)| \ge t) = E\left((X - Ex(X))^2 \ge t^2\right) \le \frac{Ex\left((X - Ex(X))^2\right)}{t^2} = \frac{V(X)}{t^2}$$

Corollary 2.14.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair S = (V, E). Consider S = (V, E) is a probability Eulerian-Path-Cut. Let X_n be a Neutrosophic Variable in a probability Eulerian-Path-Cut (V_n, E_n), $n \geq 1$. If $Ex(X_n) / = 0$ and $V(X_n) << E^2(X_n)$, then p l chk /

$$E(X_n = 0) \to 0 \ as \ n \to \infty$$

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Set $X := X_n$ and $t: = |Ex(X_n)|$ in Chebyshev's Inequality, and observe that $E(X_n = 0) \leq E(|X_n - Ex(X_n)| \geq |Ex(X_n)|)$ because $|X_n - Ex(X_n)| = |Ex(X_n)|$ when $X_n = 0$.

Theorem 2.15.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair S = (V, E). Consider S = (V, E) is a probability Eulerian-Path-Cut. Let $G \in G_{n,1/2}$. For $0 \leq k \leq n$, set $f(k) :=$ (n choose k)$^{2-(k \text{ choose } 2)}$ and let k^{*} be the least value of k for which $f(k)$ is less than one. Then almost surely $\alpha(G)$ takes one of the three values $k^* - 2$, $k^* - 1$, k^*.

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. As in the proof of related. Theorem, the result is straightforward.

Corollary 2.16.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. *Consider* $S = (V, E)$ is a probability Eulerian-Path-Cut. Let $G \in G_{n,1/2}$ and let f and k^* be as defined in previous Theorem. Then either:

(i) $f(k^*) << 1$, *in which case almost surely $\alpha(G)$ is equal to either $k^* - 2$ or $k^* - 1$, or*

(ii) $f(k^* - 1) >> 1$, *in which case almost surely $\alpha(G)$ is equal to either $k^* - 1$ or k^*.*

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. The latter is straightforward.

Definition 2.17.: Neutrosophic Threshold

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let P be a monotone property of SuperHyperGraphs (one which is preserved when SuperHyperEdges are added). Then a Neutrosophic Threshold for P is a function $f(n)$ such that:

(i) If $p << f(n)$, then $G \in G_{n,p}$ almost surely does not have P,

(ii) If $p >> f(n)$, then $G \in G_{n,p}$ almost surely has P.

Definition 2.18.: Neutrosophic Balanced

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. Let F be a fixed Neutrosophic SuperHyperGraph. Then there is a threshold function for the property of containing a copy of F as a Neutrosophic SubSuperHyperGraph is called Neutrosophic Balanced.

Theorem 2.19.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair S = (V, E). Consider S = (V, E) is a probability Eulerian-Path-Cut. Let F be a nonempty balanced Neutrosophic SubSuperHyperGraph with k SuperHyperVertices and l SuperHyperEdges. Then $n^{-k/l}$ is a threshold function for the property of containing F as a Neutrosophic SubSuperHyperGraph.

Proof: Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$. Consider $S = (V, E)$ is a probability Eulerian-Path-Cut. The latter is straightforward.

Example 2.20.

Assume a Neutrosophic SuperHyperGraph (NSHG) S is a pair $S = (V, E)$ in the mentioned Neutrosophic Figures in every Neutrosophic items.

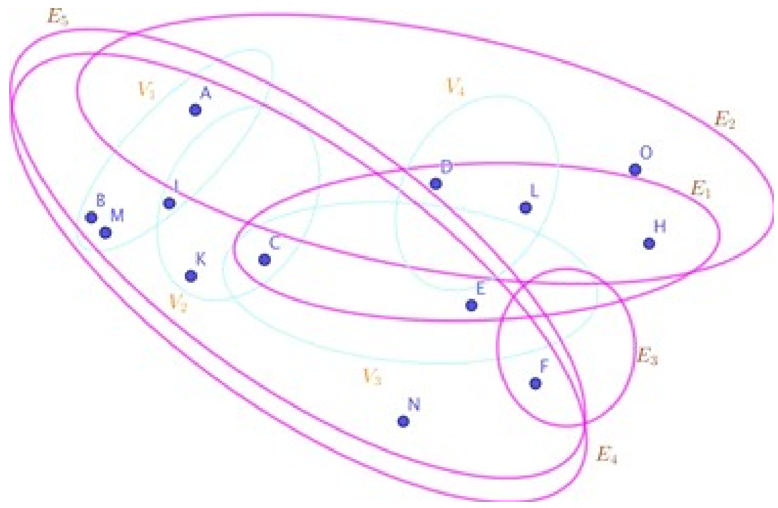

Figure 1: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

- On Figure 1, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

  $\mathcal{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

  $= \{E_4, E_5, E_1, E_2\}.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 2z^5 + 2z^3.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

  $= \{V_i \in V_{NSHG}\}.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= \Sigma z|Vi \in VNSHG|.$

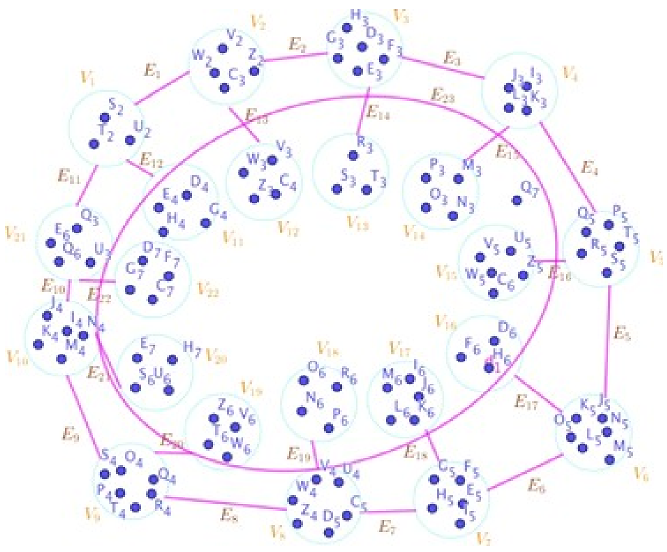

Figure 2: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

- On Figure 2, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

  $\mathrm{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathrm{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

  $\mathrm{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathrm{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

- On the Figure 3, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

  $\mathrm{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathrm{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

  $\mathrm{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathrm{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

- On the Figure 4, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

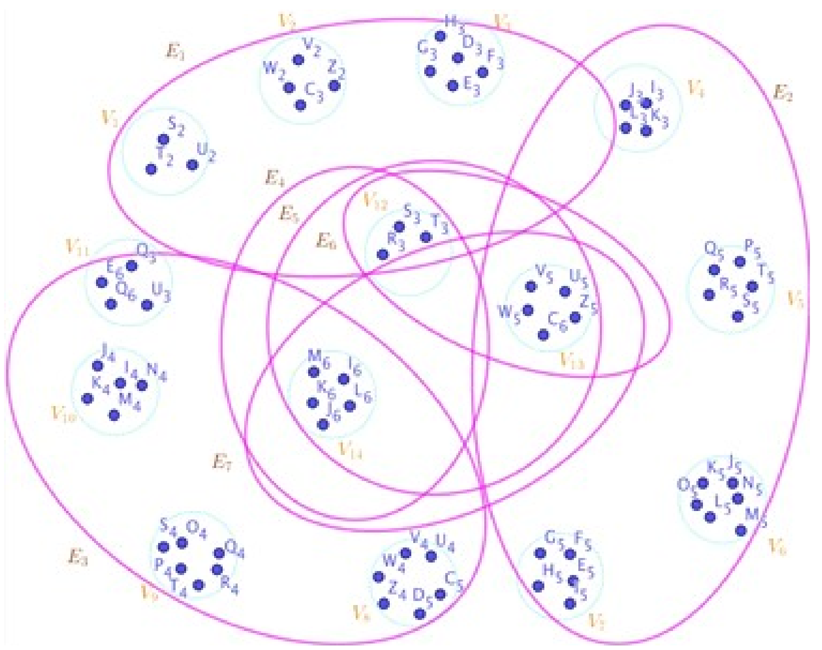

Figure 3: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

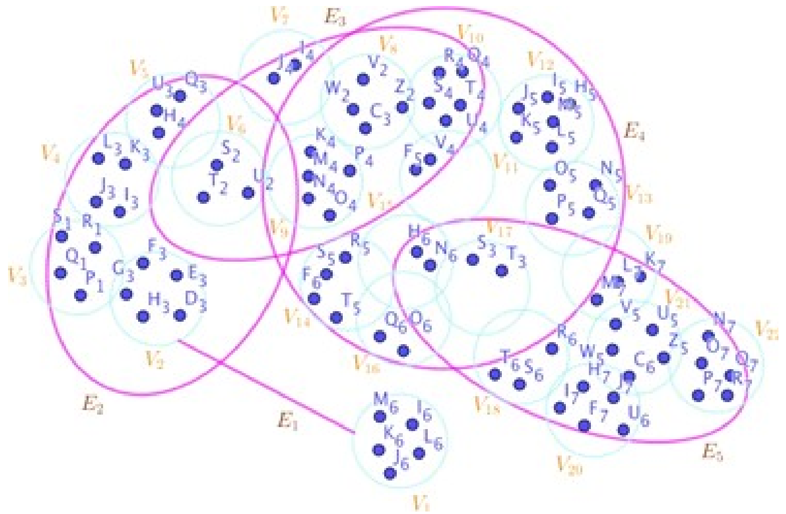

Figure 4: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

$C(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

$= \{E_1, E_2, E_3, E_4, E_5\}.$

$C(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

$= \sum_z |E_i \in E_{NSHG}|$

$C(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

$= \{V_i \in V_{NSHG}\}.$

$C(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

$= \sum_Z |V_i \in V_{NSHG}|$

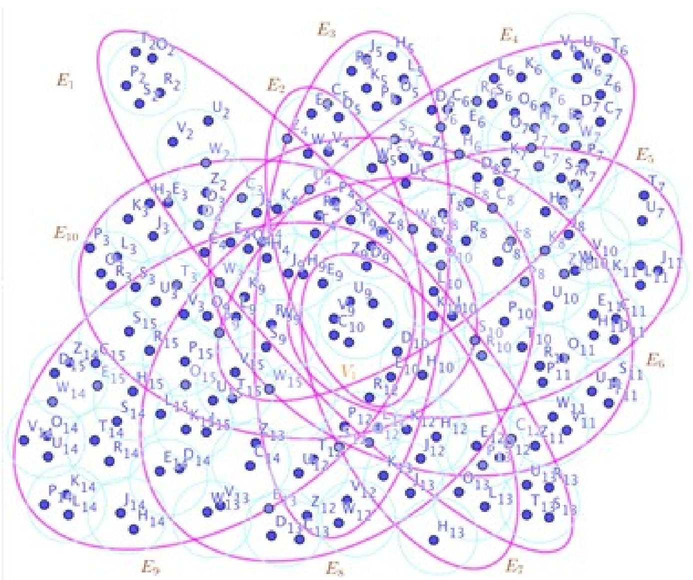

Figure 5: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

- On Figure 5, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

  $\mathcal{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

- On Figure 6, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

  $\mathcal{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

  $= \{\}.$

  $\mathcal{C}(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

  $= 0z^0.$

- On Figure 7, the Neutrosophic SuperHyperNotion, namely, Neutrosophic SuperHyperEulerian-Path-Cut, is up. The Neutrosophic Algorithm is Neutrosophicly straightforward.

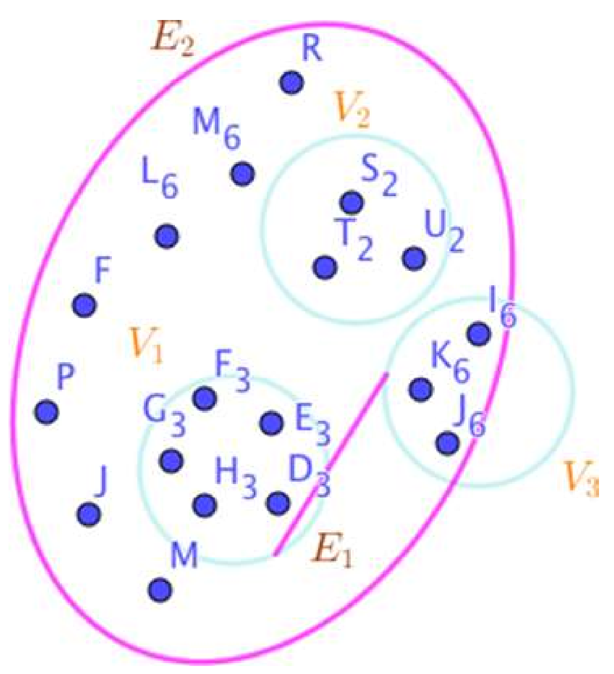

Figure 6: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

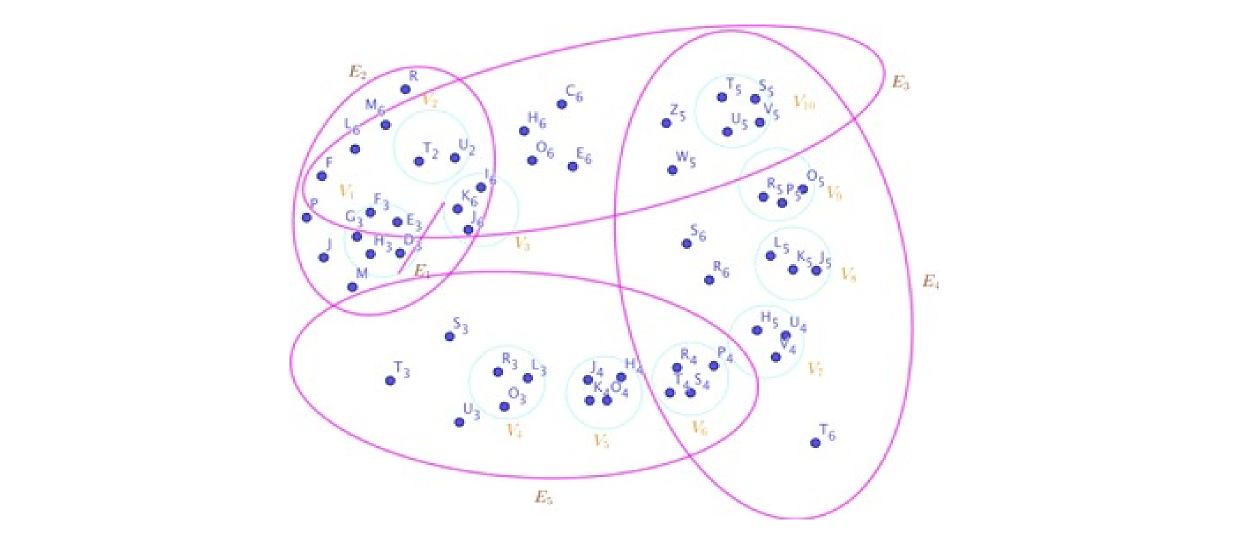

Figure 7: The Neutrosophic SuperHyperGraphs Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (3.20)

$C(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut}}$

$= \{E_2, E_3, E_4, E_5\}.$

$C(NSHG)_{\text{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

$= \sum_Z |E_i \in E_{NSHG}|$

$C(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut}}$

$= \{V_i \in V_{NSHG}\}.$

$C(NSHG)_{\text{Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial}}$

$= \sum_Z |V_i \in V_{NSHG}|$

3. The Neutrosophic Departures on the Theoretical Results Toward Theoretical Motivations

The previous Neutrosophic approach apply on the upcoming Neutrosophic results on Neutrosophic SuperHyperClasses.

Proposition 3.1.

Assume a connected Neutrosophic SuperHyperPath $ESHP : (V, E)$.

Then

$C(NSHG)_{\textit{Neutrosophic Eulerian-Path-Cut}}$

$= \{E_i \in E_{NSHG}\}.$

$C(NSHG)_{\textit{Neutrosophic Eulerian-Path-Cut SuperHyperPolynomial}}$

$= \sum_Z |E_i \in E_{NSHG}|$

$C(NSHG)$*Neutrosophic V-Eulerian-Path-Cut*

$= \{V_i \in V_{NSHG}\}.$

$C(NSHG)$*Neutrosophic V-Eulerian-Path-Cut SuperHyperPolynomial*

$= \sum_Z |V_i \in V_{NSHG}|$

Proof: Let

$P:$

$V_1^{EXTERNAL}, E_1$

$V_2^{EXTERNAL}, E_2$

$\ldots,$

$V_{|E_{NSHG}|}^{EXTERNAL}, E_{|NSHG|}$

$P:$

$E_1, V_1^{EXTERNAL}$

$E_2, V_2^{EXTERNAL}$

$\ldots,$

$E_{|NSHG|}, V_{|E_{NSHG}|}^{EXTERNAL}$

be a longest path taken from a connected Neutrosophic SuperHyperPath *ESHP* : (*V, E*). There's a new way to redefine as

$$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} =$$

$$\exists! E_z \in E_{ESHG(V,\,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv$$

$$\exists! E_z \in E_{ESHG(V,\,E)}, \left\{V_i^{EXTERNAL}, V_j^{EXTERNAL}\right\} \subseteq E_z$$

The term "EXTERNAL" implies $\left|N\left(V_i^{EXTERNAL}\right)\right| \geq \left|N\left(V_j\right)\right|$ where V_j is corresponded to $V_i^{EXTERNAL}$ in the literatures of SuperHyperEulerian-Path-Cut. The latter is straightforward.

Example 3.2.

In Figure 8, the connected Neutrosophic SuperHyperPath *ESHP* : (*V, E*), is highlighted and featured. The Neutrosophic SuperHyperSet, in the Neutrosophic SuperHyperModel (8), is the SuperHyperEulerian-Path-Cut.

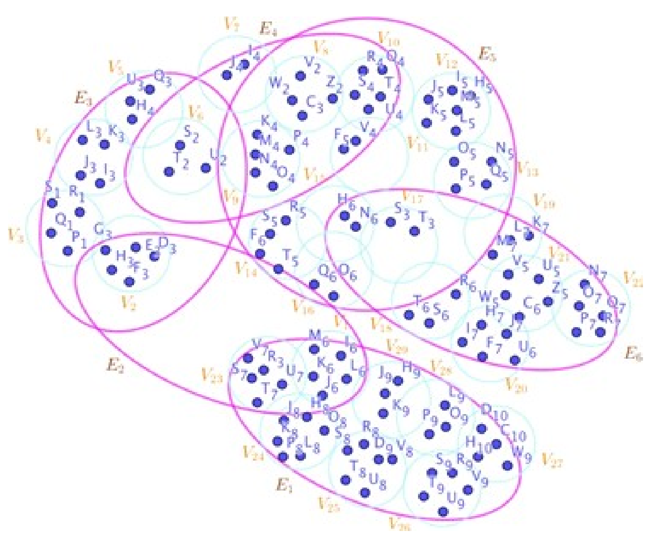

Figure 8: A Neutrosophic SuperHyperPath Associated to the Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Example (4.2)

Proposition 3.3.

Assume a connected Neutrosophic SuperHyperCycle $ESHC : (V, E)$.

Then

$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut}$

$= \{\}.$

$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$= 0z^0.$

$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut}$

$= \{\}.$

$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$= 0z^0.$

Proof: Let

$P :$

$V_1^{EXTERNAL}, E_1$

$V_2^{EXTERNAL}, E_2$

$\ldots,$

$V_{|E_{NSHG}|}^{EXTERNAL}, E_{|NSHG|}$

$P :$

$E_1, V_1^{EXTERNAL}$

$E_2, V_2^{EXTERNAL}$

$\ldots,$

$E_{|NSHG|}, V_{|E_{NSHG}|}^{EXTERNAL}$

be a longest path taken from a connected Neutrosophic SuperHyperCycle $ESHC : (V, E)$. There is a new way to redefine as

$$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} =$$

$$\exists! E_z \in E_{ESHG(V,\ E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv$$

$$\exists! E_z \in E_{ESHG(V,\ E)}, \left\{V_i^{EXTERNAL}, V_j^{EXTERNAL}\right\} \subseteq E_z$$

The term "EXTERNAL" implies $\left|N\left(V_i^{EXTERNAL}\right)\right| \geq \left|N\left(V_j\right)\right|$ where V_j is corresponded to $V_i^{EXTERNAL}$ in the literatures of SuperHyperEulerian-Path-Cut. The latter is straightforward.

Example 3.4.

In Figure 9, the connected Neutrosophic SuperHyperCycle $NSHC : (V, E)$, is highlighted and featured. The obtained Neutrosophic SuperHyperSet, in the Neutrosophic SuperHyperModel (9), is the Neutrosophic SuperHyperEulerian-Path-Cut.

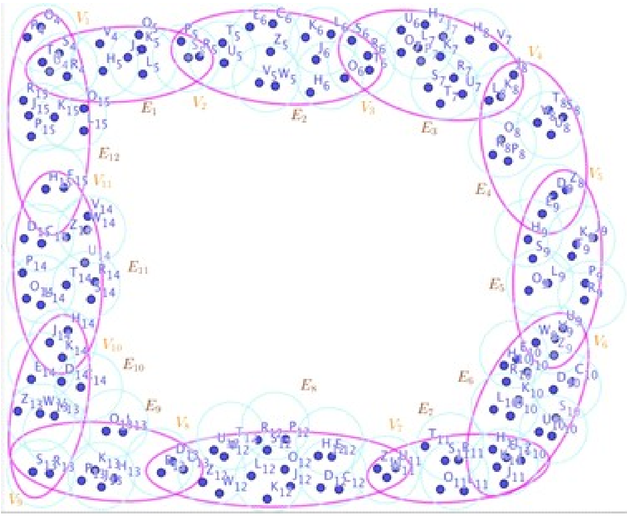

Figure 9: A Neutrosophic SuperHyperCycle Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (4.4)

Proposition 3.5.

Assume a connected Neutrosophic SuperHyperStar $ESHS : (V, E)$.

Then

$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut}$

$= \{\}.$

$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$= 0z^0.$

$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut}$

$= \{\}.$

$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$= 0z^0.$

Proof: Let

$P:$

$V_1^{EXTERNAL}, E_1$

$CENTER, E_2$

$P:$

$E_1, V_1^{EXTERNAL}$

$E_2, CENTER$

be a longest path taken a connected Neutrosophic SuperHyperStar $ESHS : (V, E)$. There's a new way to redefine as

$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} =$

$\exists! E_z \in E_{ESHG(V,\ E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv$

$\exists! E_z \in E_{ESHG(V,\ E)}, \{V_i^{EXTERNAL}, V_j^{EXTERNAL}\} \subseteq E_z$

The term "EXTERNAL" implies $\left|N\left(V_i^{EXTERNAL}\right)\right| \geq \left|N\left(V_j\right)\right|$ where V_j is corresponded to $V_i^{EXTERNAL}$ in the literatures of SuperHyperEulerian-Path-Cut. The latter is straightforward.

Example 3.6.

In the Figure 10, the connected Neutrosophic SuperHyperStar *ESHS* : (*V, E*), is highlighted and featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperStar *ESHS* : (*V, E*), in the Neutrosophic SuperHyperModel (10), is the Neutrosophic SuperHyperEulerian-Path-Cut.

Proposition 3.7.

Assume a connected Neutrosophic SuperHyperBipartite *ESHB* : (*V, E*).

Then

$\mathcal{C}(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut}$

$= \{\}.$

$\mathcal{C}(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$= 0z^0.$

$\mathcal{C}(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut}$

$= \{\}.$

$\mathcal{C}(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$= 0z^0.$

Proof: Let

P :

$V_1^{EXTERNAL}, E_1$

$V_2^{EXTERNAL}, E_2$

. . .,

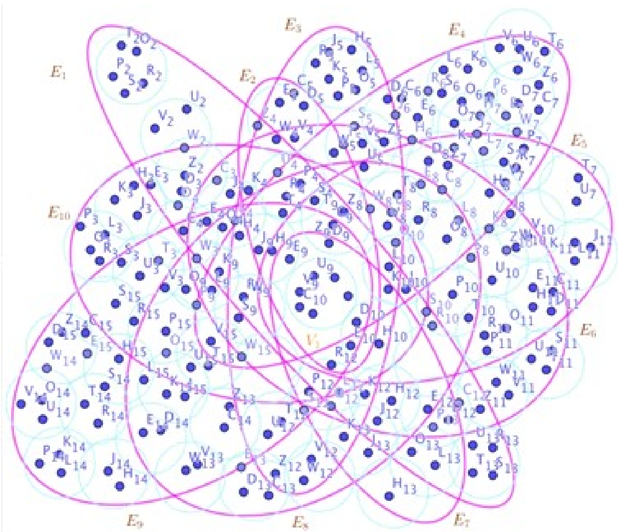

Figure 10: A Neutrosophic SuperHyperStar Associated to the Neutrosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (4.6)

$$V^{EXTERNAL}_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|},\ E_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|}$$

$$P:$$

$$E_1, V^{EXTERNAL}_1$$

$$E_2, V^{EXTERNAL}_2$$

$$\ldots,$$

$$E_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|},\ V^{EXTERNAL}_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|}$$

is a longest path taken from a connected Neutrosophic SuperHyperBipartite *ESHB* : (*V, E*). There's a new way to redefine as

$$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} =$$

$$\exists! E_z \in E_{ESHG(V,\,E)},\ V_i^{EXTERNAL},\ V_j^{EXTERNAL} \in E_z \equiv$$

$$\exists! E_z \in E_{ESHG(V,\,E)},\ \{V_i^{EXTERNAL},\ V_j^{EXTERNAL}\} \subseteq E_z$$

The term "EXTERNAL" implies $|N(V_i^{EXTERNAL})| \geq |N(V_j)|$ where V_j is corresponded to $V_i^{EXTERNAL}$ in the literatures of SuperHyperEulerian-Path-Cut. The latter is straightforward. Then there's no at least one SuperHyperEulerian-Path-Cut. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperEulerian-Path-Cut could be applied. There are only two SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$$P:$$

$$V_1^{EXTERNAL}, E_1$$

$$V_2^{EXTERNAL}, E_2$$

is a longest SuperHyperEulerian-Path-Cut taken from a connected Neutrosophic SuperHyperBipartite *ESHB* : (*V, E*). Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$$P:$$

$$V_1^{EXTERNAL}, E_1$$

$$V_2^{EXTERNAL}, E_2$$

The latter is straightforward.

Example 3.8.

In the Neutrosophic Figure (11), the connected Neutrosophic SuperHyperBipartite *ESHB* : (*V, E*)*,* is Neutrosophic highlighted and Neutrosophic featured. The obtained Neutrosophic SuperHyperSet, by the Neutrosophic Algorithm in 388 previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperBipartite *ESHB* : (*V, E*)*,* in the Neutrosophic SuperHyperModel (11), is the Neutrosophic SuperHyperEulerian-Path-Cut.

Proposition 3.9.

Assume a connected Neutrosophic SuperHyperMultipartite *ESHM* : (*V, E*).

Then

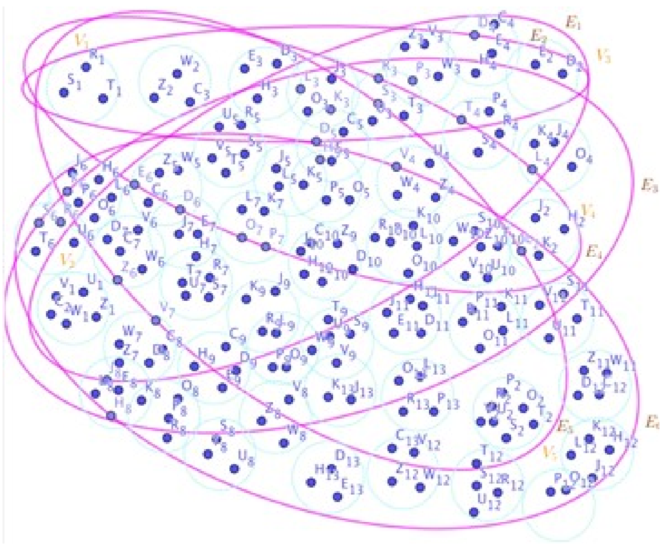

Figure 11: Neutrosophic SuperHyperBipartite Neutrosophic Associated to the Neutro- sophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Example (4.8)

$$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut}$$
$$= \{\}.$$
$$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$$
$$= 0z^0.$$
$$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut}$$
$$= \{\}.$$
$$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$$
$$= 0z^0.$$

Proof: Let

$$P:$$
$$V_1^{EXTERNAL}, E_1$$
$$V_2^{EXTERNAL}, E_2$$
$$\ldots,$$
$$V^{EXTERNAL}_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|}, E_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|}$$
$$P:$$
$$E_1, V_1^{EXTERNAL}$$
$$E_2, V_2^{EXTERNAL}$$
$$\ldots,$$
$$E_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|}, V^{EXTERNAL}_{|P_i|=\min_{P_j\in E_{NSHG}}|P_j|}$$

is a longest SuperHyperEulerian-Path-Cut taken from a connected Neutrosophic SuperHyperMultipartite *ESHM* : (*V, E*). There's a new way to redefine as

$$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} =$$

$$\exists! E_z \in E_{ESHG(V,\,E)},\, V_i^{EXTERNAL},\, V_j^{EXTERNAL} \in E_z \equiv$$

$$\exists! E_z \in E_{ESHG(V,\,E)},\, \{V_i^{EXTERNAL},\, V_j^{EXTERNAL}\} \subseteq E_z$$

The term "EXTERNAL" implies $\left|N\left(V_i^{EXTERNAL}\right)\right| \geq \left|N\left(V_j\right)\right|$ where V_j is corresponded to $V_i^{EXTERNAL}$ in the literatures of SuperHyperEulerian-Path-Cut. The latter is straightforward. Then there's no at least one SuperHyperEulerian-Path-Cut. Thus the notion of quasi may be up but the SuperHyperNotions based on SuperHyperEulerian-Path-Cut could be applied. There are only z^2 SuperHyperParts. Thus every SuperHyperPart could have one SuperHyperVertex as the representative in the

$P:$

$V_1^{EXTERNAL},\, E_1$

$V_2^{EXTERNAL},\, E_2$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite *ESHM* : (*V, E*). Thus only some SuperHyperVertices and only minimum-Neutrosophic-of-SuperHyperPart SuperHyperEdges are attained in any solution

$P:$

$V_1^{EXTERNAL},\, E_1$

$V_2^{EXTERNAL},\, E_2$

is a longest path taken from a connected Neutrosophic SuperHyperMultipartite *ESHM* : (*V, E*). The latter is straightforward.

Example 3.10.

In Figure 12, the connected Neutrosophic SuperHyperMultipartite *ESHM* : (*V, E*), is highlighted and Neutrosophic featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous Neutrosophic result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperMultipartite *ESHM* : (*V, E*), in the Neutrosophic SuperHyperModel (12), is the Neutrosophic SuperHyperEulerian-Path-Cut.

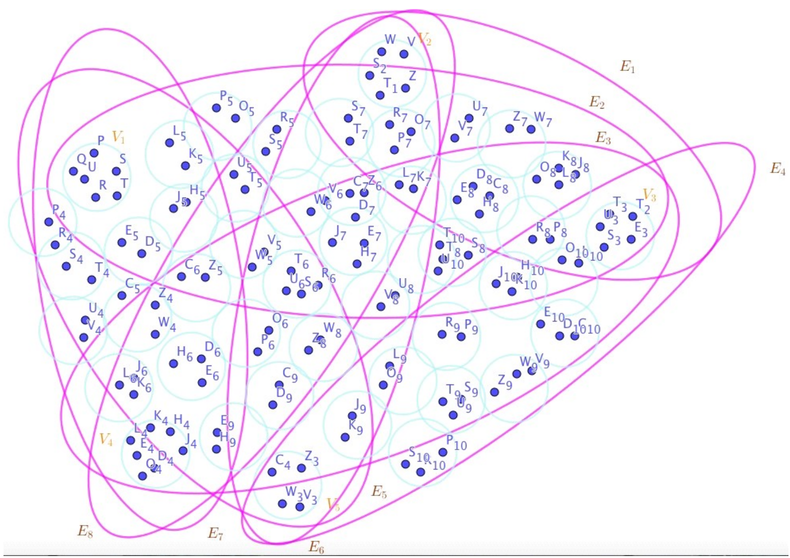

Figure 12: A Neutrosophic SuperHyperMultipartite Associated to the Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Example (4.10)

Proposition 3.11.

Assume a connected Neutrosophic SuperHyperWheel $ESHW:(V,E)$.

Then

$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut}$

$=\{\}.$

$C(NSHG)_{Neutrosophic\ Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$=0z^0.$

$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut}$

$=\{\}.$

$C(NSHG)_{Neutrosophic\ V\text{-}Eulerian\text{-}Path\text{-}Cut\ SuperHyperPolynomial}$

$=0z^0.$

Proof: Let

$P:$

$V_1^{EXTERNAL}, E_1^*$

$CENTER, E_2^*$

$P:$

$E_1^*, V_1^{EXTERNAL}$

$E_2^*, CENTER$

is a longest SuperHyperEulerian-Path-Cut taken from a connected Neutrosophic SuperHyperWheel $ESHW:(V,E)$. There's a new way to redefine as

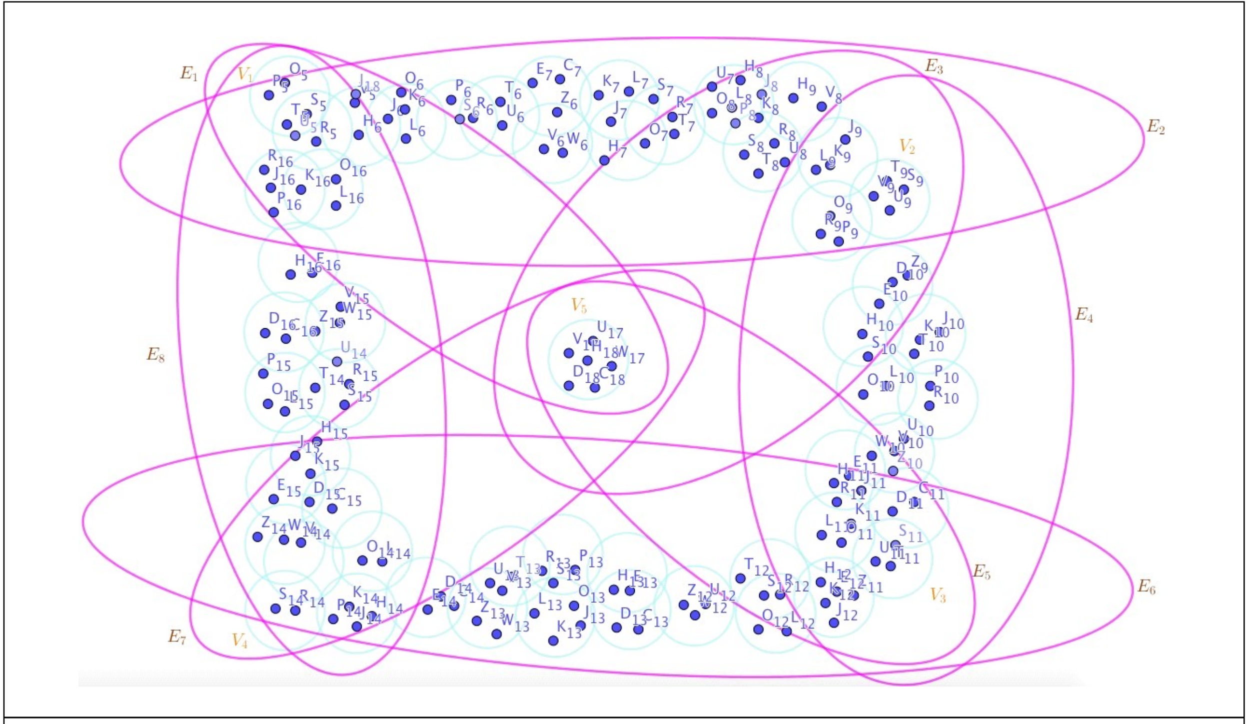

Figure 13: A Neutrosophic SuperHyperWheel Neutrosophic Associated to the Neu- trosophic Notions of Neutrosophic SuperHyperEulerian-Path-Cut in the Neutrosophic Example (4.12)

$$V_i^{EXTERNAL} \sim V_j^{EXTERNAL} =$$

$$\exists ! E_z \in E_{ESHG(V,\,E)}, V_i^{EXTERNAL}, V_j^{EXTERNAL} \in E_z \equiv$$

$$\exists ! E_z \in E_{ESHG(V,\,E)}, \left\{V_i^{EXTERNAL}, V_j^{EXTERNAL}\right\} \subseteq E_z$$

The term "EXTERNAL" implies $\left|N\left(V_i^{EXTERNAL}\right)\right| \geq \left|N\left(V_j\right)\right|$ where V_j is corresponded to $V_i^{EXTERNAL}$ in the literatures of SuperHyperEulerian-Path-Cut. The latter is straightforward. Then there's at least one SuperHyperEulerian-Path-Cut. Thus the notion of quasi isn't up and the SuperHyperNotions based on SuperHyperEulerian-Path-Cut could be applied. The unique embedded SuperHyperEulerian-Path-Cut proposes some longest SuperHyperEulerian-Path-Cut excerpt from some representatives. The latter is straightforward.

Example 3.12.

In the Neutrosophic Figure 13, the connected Neutrosophic SuperHyperWheel $NSHW : (V, E)$, is Neutrosophic highlighted and featured. The obtained Neutrosophic SuperHyperSet, by the Algorithm in previous result, of the Neutrosophic SuperHyperVertices of the connected Neutrosophic SuperHyperWheel $ESHW : (V, E)$, in the Neutrosophic SuperHyperModel (13), is the Neutrosophic SuperHyperEulerian-Path-Cut.

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