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To analyze the problems of Transgender in India/Study Using New Triangular Combined Block Fuzzy Cognitive Maps (TrCBFCM)

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Abstract: Transgender is an Umbrella term for persons whose gender identity and gender expressions or behavior do not conform to that typically associated with the sex to which they were assigned at birth. Gender Identity refers to a person's internal sense of being male, female or something else. Gender expression refers to the way a person communicates gender identity to others through behavior, clothing, hair styles, voice or body characteristics etc. FCM we analyze the causes and effects of the relationships among the concepts to model the behavior of any system. But this new model gives the causes and effect of the relationships among the concepts to model behavior with ranking of any system. In this paper, we analyze the Transgender problem using Combined Block Triangular Fuzzy Cognitive Maps. Based on our studies we can give the conclusion and suggestions based on our study..

Index Terms: Fuzzy Cognitive Maps (FCMs) Combined Block Triangular Cognitive Maps, Triangular Fuzzy Numbers, and Transgender.

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1 INTRODUCTION

Gender Identity or sexual Orientation: Transgender people may be straight, lesbian, gay, and bisexual, just as non Transgender people can be. There are many types of trans-people like Lesbian, Gay, Bisexual and Transgender and in short called as LGBT due to some common concern requiring intervention from Government through policy measures to resolve certain basic problems..

Lesbian or gay woman: A transgender woman or a person who is assigned male at birth and transitions to female, who is attracted to other woman would be identified as lesbian or gay woman

Gay man: A transgender man or a person who is assigned female at birth and transitions to male, who is attracted to other men would be identified as a gay man.

Every child in the womb is a girl in the beginning then it turns out to be a guy after series of changes. And if transition is incomplete it tends to be a Transgender. The problems faced by these people one innumerable beginning from education and it extends till rest room. Even the parents who accept the physically challenged kids deny to accepting these kids whole heartedly. We can hardly find a column for transgenders in an application form. These people are rejected by their parents, friends and neighbors. At last they end up being uneducated. Transgender one misused to a great extend and are often pushed into sex work. Owing to lack of education these people become jobless and few who leaves no stones unturned get job and then they are forced to have sex with peers. Even the government has not given any proof of address of national ID.Most of these transgenders are affected by deadly disease like HIV/AIDS thus their future tends to be their future tends to be a question mark.

Lotfi. A. Zadeh (1965) has introduced a mathematical model called Fuzzy Cognitive Maps. After a decade, Political scientist Axelord (1976) used this fuzzy model to study decision making in social and political systems. Then Kosko (1986, 1988 and 1997) enhanced the power of cognitive maps considering fuzzy values for the concepts of the cognitive map and fuzzy degrees of interrelationships between concepts. FCMs can successfully represent knowledge and human experience, introduced concepts to represent the essential elements and the cause and effect relationships among the concepts to model the behavior of any system

2 PRELIMINARIES:

$$\mu_A(x)=\begin{cases}0 & for\ x<a_1\\ \dfrac{x-a_1}{a_2-a_1} & for\ a_1\le x\le a_2\\ \dfrac{a_3-x}{a_3-a_2} & for\ a_2\le x\le a_3\\ 0 & for\ x>a_3\end{cases}$$

2.1.2. Operation of Triangular Fuzzy Number

The following are the four operations that can be performed on triangular fuzzy numbers: Let $A=(a_1,a_2,a_3)$ and $B=(b_1,b_2,b_3)$ then,

(i) Addition (+): $A+B=(a_1+b_1,a_2+b_2,a_3+b_3)$

(ii) Subtraction (-): $A+B=(a_1-b_1,a_2-b_2,a_3-b_3)$ Multiplication ($\otimes$) :

(a) $k\otimes A=(ka_1,ka_2,ka_3),\ k\in R,\ k\ge 0$

(iii) $A\otimes b=(a_1b_1,a_2b_2,c_1c_2),\ a_1\ge 0,\ a_2\ge 0$ Division ($\varnothing$):

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$$(A)^{-1} = (a_1, b_1, c_1)^{-1} \cong \left(\frac{1}{c_1}, \frac{1}{b_1}, \frac{1}{a_1} \right),\ a_1 > 0$$

$$A \oslash B \cong \left(\frac{a_1}{c_2}, \frac{b_1}{b_2}, \frac{c_1}{a_2} \right),\ a_1 \geq 0,\ a_2 > 0$$

2.1.3 Degrees of the Triangular Fuzzy Number

The linguistic values of the triangular fuzzy numbers are

Very Low	(0, 0, 0.25)
Low	(0, 0.25, 0.50)
Medium	(0.25, 0.50, 0.75)
High	(0.50, 0.75, 1)
Very High	(0.75, 1, 1)

2.2. Basic Definitions of Triangular Fuzzy Cognitive Maps (TrFCMs)

Triangular Fuzzy Cognitive Maps (TrFCM) are more applicable when the data in the first place is an unsupervised one. The TrFCM works on the opinion of three experts. TrFCM models the world as a collection of classes and causal relations between classes. It is a different process when we compare to FCM. Usually the FCM gives only the ON-OFF position. But this Triangular Fuzzy Cognitive Maps is more precise and it gives the ranking for the causes of the problem by using the weightage of the attribute it is main advantage of the new Triangular Fuzzy Cognitive Maps.

2.2.1. Definition

When the nodes of the TrFCM are fuzzy sets then they are called as fuzzy triangular nodes.

3 DEFINITIONS

3.2. Definition

Triangular FCMs with edge weights or causalities from the set {-1, 0, 1} are called simple Triangular FCMs.

33. Definition

An TrFCM is a directed graph with concepts like policies, events etc, as nodes and causalities as edges, It represents causal relationships between concepts.

3.1.4. Definition

Consider the nodes/concepts TrC_1, TrC2… TrCn of the Triangular FCM. Suppose the directed graph is drawn using edge weight $Tr_{eij} \in$ {-1, 0, 1}. The triangular matrix M be defined by Tr(M) = (Treij) where Treij is the triangular weight of the directed edge TrC_i TrC_j. Tr(M) is called the adjacency matrix of Triangular Fuzzy Cognitive Maps, also known as the connection matrix of the TrFCM. It is important to note that all matrices associated with an TrFCM are always square matrices with diagonal entries as zero.

3.1.5. Definition

Let TrC1, TrC2… TrCn be the nodes of an TrFCM. A=(a_1, a_2,…,a_n) where Treij∈ {-1, 0,1}. A is called the instantaneous state vector and it denotes the on-off position of the node at an instant.

$$\text{Instantaneous vector } = \begin{cases} {}_{Tr}a_i = 1 & Maximum(weight) \\ {}_{Tr}a_i = 0 & Otherwise \end{cases}$$

3.1.6. Definition

Let TrC1, TrC2,…, TrCn be the triangular nodes of and TrFCM. Let $\overrightarrow{{}_{Tr}C_1\,{}_{Tr}C_2}, \overrightarrow{{}_{Tr}C_2\,{}_{Tr}C_3}, \overrightarrow{{}_{Tr}C_3\,{}_{Tr}C_4}, \ldots \overrightarrow{{}_{Tr}C_i\,{}_{Tr}C_j}$ be the edges of the TrFCM (i≠j). Then the edges

Form a directed cycle. An TrFCM is said to be cyclic if it possesses a directed cycle. An TrFCM is said to be acyclic if it does not possess any directed cycle.

3.1.7. Definition

An TrFCM is said to be cyclic is said to have a feedback.

3.1.8. Definition

When there is a feedback in an TrFCM, i.e., when the causal relations flow through a cycle in a revolutionary way, the TrFCM is called a dynamical system.

3.1.9. Definition

Let $\overrightarrow{{}_{Tr}C_1\,{}_{Tr}C_2}, \overrightarrow{{}_{Tr}C_2\,{}_{Tr}C_3}, \overrightarrow{{}_{Tr}C_3\,{}_{Tr}C_4}, \ldots \overrightarrow{{}_{Tr}C_{n-1}\,{}_{Tr}C_n}$ be a cycle. When TrC_i is switched ON and if the causality flows through the triangular edges of a cycle and if it again causes C_i, we say that the dynamical system goes round and round. This is true for any triangular node TrC_i for i =1,2,…,n. The equilibrium state for this dynamical system is called the hidden pattern.

3.1.10. Definition

If the equilibrium state of a dynamical system is a unique state vector, then it is called a fixed point. Consider a TrFCM with TrC1, TrC2… TrCn as nodes. For example let us start the dynamical system by switching on TrC1.Let us assume that the TrFCM settles down with Tr_{C1} and Tr_{Cn} ON i.e., in the state vector Remains as (1, 0, 0… 0) is called fixed point.

3.1.11. Definition

If the TrFCM settles down with a state vector repeating in the form A1→A2→…→Ai→A1 then this equilibrium is called a limit cycle.

ISSN 2229-5518

3.1.12. Definition

Let TrC_1 ,TrC_2….TrC_n be n distinct attributes of a problem n very large and a non-prime. If we divide n into k equal classes. i.e., k/n and if $n / k = t$ which are disjoint and if we find the directed graph of each of their classes of attributes with t attributes each then their corresponding connection matrices are formed and these connection matrices as blocks to form a nxn matrix. The nxn connection matrix forms the combined block FCM of equal classes. If the classes are not divided to have equal attributes but if they are classes we have nxn connection matrix called the combined disjoint block FCM of unequal classes / size. Here we approach the problem through attributes using combined equal block fuzzy cognitive maps (CBFCMs) that are basically matrices which predict the feelings of all the attributes under certain conditions. Before we proceed to apply combined equal block Triangular fuzzy cognitive maps (Combined TrFCMs) to this problem we define a set of 15 attributes given by experts. We work with analyzing from using directed graph and its connection matrices.

3.2. Method of Determining the Hidden Pattern of Triangular Fuzzy Cognitive Maps (TrFCMs)

Step 1: Let TrC1, TrC2… TrCn be the nodes of an TrFCM, with feedback, Let Tr(M) be the associated adjacency matrix.

Step 2: Let us find the hidden pattern when TrC1 is switched ON. When an input is given as the vectorA1 = (1, 0,…, 0), the data should pass through the relation matrix M. This is done by multiplying Ai by the triangular matrix M.

Step 3: Let AiTr (M) = (a_1, a_2,…, an) will get a triangular vector. Suppose A_1Tr(M) = (1, 0… 0)it gives a triangular weight of the attributes, we call it as Ai Tr(M)weight.

Step 4: Adding the corresponding node of the three experts opinion, we call it as Ai Tr(M) sum.

Step 5: The threshold operation is denoted by (↵) i.e., A_1Tr(M) Max(weight). That is by replacing ai by 1 if ails the maximum weight of the triangular node (ie, ai=1), otherwise ai by 0(ie. ai=0).

Step 6: Suppose A_1Tr (M) → A2 then consider A_2Tr(M) weight is nothing but addition of weightage of the ON attribute and A_1 Tr(M)weight

.

Step 7: Find A_2 Tr (M) sum (ie, summing of the three experts opinion of each attributes).

Step 8: The threshold operation is denoted by (↵) i.e., A_2Tr(M) Max (weight). That is by replacing ai by 1 if ai is the maximum weight of the triangular node (i.e...Ai=1), otherwise ai by 0 (i.e., ai=0).

Step 9: If the A_1Tr(M)Max(weight).=A_2Tr(M)Max(weight). Then dynamical system end otherwise repeat the same procedure.

Step 10: This procedure is repeated till we get a limit cycle or a fixed point.

4 CONCEPT OF THE PROBLEM;

We have taken the following ten concepts {TrC1, TrC2…TrC15}.To analyze of the major reasons for problems of Transgender, using new triangular fuzzy cognitive map (TR-FCM). The following concepts are taken as the main nodes of our problem.

TrC_1 – Penury
TrC_2 – Lack of education
TrC_3 – Mal nutrition
TrC_4 – Lack of shelter
TrC_5 – Without parents/relatives
TrC_6 – No permanent job
TrC_7 – No property
TrC_8 – Future is a Question mark
TrC_9 – Stress/depression
TrC_{10} – Health problem
TrC_{11} – Forcing to sex
TrC_{12} – Begging
TrC_{13} – Public cheating
TrC_{14} – No legal rights
TrC_{15} – HIV/AIDS

These 15 attributes are divided into 3 classes TrM₁, TrM₂, TrM₃ with each having 5 concepts in the following way.

3.1. Case (i) the following is the directed graph obtained based on the first experts (transgender) view:

Let $A = TrC_1, TrC_2, TrC_3, TrC_4, TrC_5$

$$TrM_1 = \begin{array}{c|ccccc} & TrC_1 & TrC_2 & TrC_3 & TrC_4 & TrC_5 \\ TrC_1 & 0 & VH & H & VL & M \\ TrC_2 & VH & 0 & M & L & VL \\ TrC_3 & H & M & 0 & VH & VL \\ TrC_4 & M & L & H & 0 & VH \\ TrC_5 & H & M & H & VH & 0 \end{array}$$

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3.1. Case (ii) the following is the directed graph obtained based on the first experts (transgender Parents) view:

Let $B = TrC_6, TrC_7, TrC_8, TrC_9, TrC_{10}$

$$TrM_2 = \begin{array}{c|ccccc} & TrC_6 & TrC_7 & TrC_8 & TrC_9 & TrC_{10} \\ \hline TrC_6 & 0 & H & VH & M & L \\ TrC_7 & VH & 0 & H & L & VL \\ TrC_8 & H & M & 0 & VH & H \\ TrC_9 & L & M & VH & 0 & H \\ TrC_{10} & H & L & H & VH & 0 \end{array}$$

3.1. Case (iii) the following is the directed graph obtained based on the first experts (Leader of the NGO's Leader) view:

Let $C = TrC_{11}, TrC_{12}, TrC_{13}, TrC_{14}, TrC_{15}$

$$TrM_1 = \begin{array}{c|ccccc} & TrC_{11} & TrC_{12} & TrC_{13} & TrC_{14} & TrC_{15} \\ \hline TrC_{11} & 0 & H & VH & H & H \\ TrC_{12} & L & 0 & VH & H & VL \\ TrC_{13} & VH & M & 0 & L & VL \\ TrC_{14} & H & H & VH & 0 & VL \\ TrC_{15} & VH & H & M & L & 0 \end{array}$$

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Now we give the connection matrix related with the FCM.

The combined triangular connection matrix is given by

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}	C_{14}	C_{15}
C_1	**0**	**VH**	**H**	**VL**	**M**	0	0	0	0	0	0	0	0	0	0
C_2	**VH**	**0**	**M**	**L**	**VL**	0	0	0	0	0	0	0	0	0	0
C_3	**H**	**M**	**0**	**VH**	**VL**	0	0	0	0	0	0	0	0	0	0
C_4	**M**	**L**	**H**	**0**	**VH**	0	0	0	0	0	0	0	0	0	0
C_5	**H**	**M**	**H**	**VH**	**0**	0	0	0	0	0	0	0	0	0	0
C_6	0	0	0	0	0	**0**	**H**	**VH**	**M**	**L**	0	0	0	0	0
C_7	0	0	0	0	0	**VH**	**0**	**H**	**L**	**VL**	0	0	0	0	0
C_8	0	0	0	0	0	**H**	**M**	**0**	**VH**	**H**	0	0	0	0	0
C_9	0	0	0	0	0	**L**	**M**	**VH**	**0**	**H**	0	0	0	0	0
C_{10}	0	0	0	0	0	**H**	**L**	**H**	**VH**	**0**	0	0	0	0	0
C_{11}	0	0	0	0	0	0	0	0	0	0	**0**	**H**	**VH**	**H**	**H**
C_{12}	0	0	0	0	0	0	0	0	0	0	**L**	**0**	**VH**	**H**	**VL**
C_{13}	0	0	0	0	0	0	0	0	0	0	**VH**	**M**	**0**	**L**	**VL**
C_{14}	0	0	0	0	0	0	0	0	0	0	**H**	**H**	**VH**	**0**	**VL**
C_{15}	0	0	0	0	0	0	0	0	0	0	**VH**	**H**	**M**	**L**	**0**

Now we combined block connection matrix of the Triangular fuzzy cognitive matrix of the fuzzy Cognitive maps Tr M is given by

	C_1	C_2	C_3	C_4	C_5	C_6	C_7	C_8	C_9	C_{10}	C_{11}	C_{12}	C_{13}	C_{14}	C_{15}
C_1	0	(0.75, 1,1)	0.50,0.75, 1	(0, 0,0.25)	(0.25, 0.50, 0.75)	0	0	0	0	0	0	0	0	0	0
C_2	0.75,1,1	0	(0.25, 0.50, 0.75)	(0, 0,0.25)	(0,0.25, 0.50)	0	0	0	0	0	0	0	0	0	0
C_3	(0.50,0.75, 1)	(0.25, 0.50, 0.75)	0	(0.75,1,1)	(0,0.25, 0.50)	0	0	0	0	0	0	0	0	0	0
C_4	(0.25, 0.50, 0.75)	(0,0, 0.25)	(0.50,0.75 ,1)	0	(0.75,1,1)	0	0	0	0	0	0	0	0	0	0
C_5	(0.50,0.75, 1)	(0.25, 0.50, 0.75)	(0.50,0.75 ,1)	(0.75,1,1)	0	0	0	0	0	0	0	0	0	0	0
C_6	0	0	0	0	0	0	(0.50,0.7 5,1)	(0.75,1,1)	(0.25, 0.50, 0.75)	(0,0, 0.25)	0	0	0	0	0
C_7	0	0	0	0	0	0.75,1,1	0	0.50,0.75,1	(0,0, 0.25)	(0,0.25, 0.50)	0	0	0	0	0
C_8	0	0	0	0	0	0.50,0.75,1	(0.25, 0.50, 0.75)	0	0.75,1,1	0.50,0.75,1	0	0	0	0	0
C_9	0	0	0	0	0	(0,0, 0.25)	(0.25, 0.50, 0.75)	0.75,1,1	0	0.50,0.75,1	0	0	0	0	0
C_{10}	0	0	0	0	0	0.50,0.75,1	(0,0, 0.25)	0.50,0.75,1	0.75,1,1	0	0	0	0	0	0
C_{11}	0	0	0	0	0	0	0	0	0	0	0	0.50,0.75, 1	0.75,1,1	0.50,0.75,1	0.50,0.75,1
C_{12}	0	0	0	0	0	0	0	0	0	0	(0,0, 0.25)	0	0.75,1,1	0.50,0.75,1	(0,0.25, 0.50)
C_{13}	0	0	0	0	0	0	0	0	0	0	0.75,1,1	(0.25, 0.50, 0.75)	0	(0,0, 0.25)	(0,0.25, 0.50)
C_{14}	0	0	0	0	0	0	0	0	0	0	0.50,0.75,1	0.50,0.75, 1	0.75,1,1	0	(0,0.25, 0.50)
C_{15}	0	0	0	0	0	0	0	0	0	0	0.75,1,1	0.50,0.75, 1	(0.25, 0.50, 0.75)	(0,0, 0.25)	0

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Case (i): Attribute ${}_{Tr}C_1$ is ON

Let $A^{(1)} = (\mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$

$A^{(1)}TrM_{(Weight)} = \{0, (0.75,1,1), (0.50,0.75,1), (0,0,0.25), (0.25,0.50,0.75), 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\}$

$A^{(1)}TrM_{(\text{Average})} = \{0,\ \mathbf{0.9166},\ 0.75, 0.0833,\ 0.50,\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\ \}$

$A^{(1)}TrM_{(Max.Weight)} = (0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_1^{(1)}$

$\mathrm{A}_1^{(1)}\ TrM_{(Weight)} = \{(0.75,1,1), 0,\ (0.25, 0.50, 0.75),\ (0, 0.25, 0.50),\ (0,0,0.25),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$= \{\mathbf{0.9166,}\ 0,\ 0.50,\ 0.25,\ 0.0833,\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\ \}$

$\mathrm{A}_1^{(1)}\ TrM_{(\text{Max}.Weight)} = (\mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_2^{(1)}$

$\mathrm{A}_2^{(1)}\ TrM_{(Weight)} = \{0,\ (0.75,1,1), 0,\ (0.50, 0.75, 1),\ (0.25, 0.50, 0.75),\ (0,0,0.25),\ (0.25, 0.50, 0.75),$ $0, 0, 0,\ 0, 0, 0, 0,\ 0,\ 0, 0\}$

$\mathrm{A}_2^{(1)}\ TrM_{(\text{Max}.Weight)} = (0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_3^{(1)} = \mathrm{A}_1^{(1)}$

Case (ii): Attribute ${}_{Tr}C_2$ is ON

$A^{(2)} = (0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$

$A^{(2)}TrM_{(Weight)} = \{(0.75,1,1), 0,\ (0.25, 0.50, 0.75),\ (0,0,0.25),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$A^{(2)}TrM_{(\text{Average})} = \{\mathbf{0.9166},\ 0.50,\ 0.25,\ 0.0833,\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$A^{(2)}TrM_{(\text{Max}.Weight)} = (\mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_1^{(2)}$

$A_1^{(2)}TrM_{(\text{Average})} = \{0,\ \mathbf{0.9166},\ 0.75, 0.0833,\ 0.50,\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$\mathrm{A}_1^{(2)}\ TrM_{(\text{Max}.Weight)} = (0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_2^{(2)}$

$A^{(2)} = (0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$

$A^{(2)}TrM_{(Weight)} = \{(0.75,1,1), 0,\ (0.25, 0.50, 0.75),\ (0,0,0.25),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$A^{(2)}TrM_{(\text{Average})} = \{\mathbf{0.9166},\ 0.50,\ 0.25,\ 0.0833,\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$A^{(2)}TrM_{(\text{Max}.Weight)} = (\mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_1^{(2)}$

$\therefore A_1^{(2)} = A_3^{(2)}$

Case (iii): Attribute ${}_{Tr}C_3$ is ON

$A^{(3)} = (0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$

$A^{(3)}TrM_{(Weight)} = \{(0.50, 0.75, 1),\ (0.25, 0.50, 0.75),\ 0,\ (0.75,1,1),\ (0,0,0.25),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$A^{(3)}TrM_{(\text{Average})} = \{0.75,\ 0.50,\ 0,\ \mathbf{0.9166},\ 0.0833,\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$\mathrm{A}^{(3)}\ TrM_{(Max.Weight)} = (0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_1^{(3)}$

Now, $\mathrm{A}_1^{(3)}\ TrM_{(Weight)} = \{(0.25, 0.50, 0.75), (0, 0.25, 0.50),\ (0.50, 0.75, 1),\ 0,\ (0.75,1,1),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0\}$

$\mathrm{A}_1^{(3)}\ TrM_{(Weight)} = (0\ 0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_2^{(3)}$

$\mathrm{A}_2^{(3)}\ TrM_{(Weight)} = \{(0.50, 0.75, 1),\ (0.25, 0.50, 0.75), (0.50, 0.75, 1),\ (0.75,1,1),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0\}$

$\mathrm{A}_2^{(3)}\ TrM_{(\text{Max}.Weight)} = (0.75,\ 0.50,\ 0.75,\ \mathbf{0.9166},\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0)$

$= (0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_2^{(3)} = A_1^{(3)}$

Case (iv): Attribute ${}_{Tr}C_4$ is ON

$A^{(4)} = (0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$

$A^{(4)}TrM_{(\text{Average})} = \{0.50,\ 0.25,\ 0.75,\ 0,\ \mathbf{0.9166},\ 0,\ 0,\ 0,\ 0,\ 0,\ 0,\ 0,\ 0,\ 0,\ 0\}$

$A^{(4)}TrM_{(Max.weight)} = (0\ 0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_1^{(4)}$

$\mathrm{A}_1^{(4)}\ TrM_{(Weight)} = \{(0.50, 0.75, 1),\ (0.25, 0.50, 0.75), (0.5, 0.75, 1),\ (0.75,1,1),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0\}$

$\mathrm{A}_1^{(4)}\ TrM_{(\text{Max}.Weight)} = (0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_2^{(4)}$

$$\mathrm{A}_2^{(4)}\, TrM_{(Weight)} = \{(0.25, 0.50, 0.75),\ (0, 0.25, 0.5),\ (0.50, 0.75, 1),\ 0,\ (0.75, 1, 1),\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0\}$$
$$\mathrm{A}_2^{(4)}\, TrM_{(\mathrm{Max}.Weight)} = (0\ 0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_3^{(4)} = \mathrm{A}_1^{(4)}$$

Case (v): Attribute ${}_{Tr}C_5$ is ON

$$A^{(5)} = (0\ 0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$$
$$A^{(5)}TrM_{(\mathrm{Average})} = \{(0.50, 0.75, 1),\ (0.25, 0.50, 0.75), (0.5, 0.75, 1),\ (0.75, 1, 1),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0\}$$
$$A^{(5)}TrM_{(Max.weight)} = (0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = \mathrm{A}_1^{(5)}$$
$$\mathrm{A}_1^{(5)}\, TrM_{(Weight)} = \{(0.25, 0.50, 0.75),\ (0, 0.25, 0.5),\ (0.50, 0.75, 1),\ 0,\ (0.75, 1, 1),\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0\}$$
$$A_{1\ (Max.weight)}^{(5)} = (0\ 0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_2^{(5)}$$
$$A_2^{(5)}TrM_{(Weight)} = \{(0.50, 0.75, 1),\ (0.25, 0.50, 0.75), (0.5, 0.75, 1),\ (0.75, 1, 1),\ 0,\ 0, 0,\ 0,\ 0,\ 0, 0,\ 0,\ 0,\ 0,\ 0\}$$
$$A_2^{(5)}TrM_{(\mathrm{Max}.Weight)} = (0\ 0\ 0\ \mathbf{1}\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0) = A_3^{(5)} = A_1^{(5)}$$

Do the process for the remaining attributes:

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Table: 1 Weightage of the attributes

Attributes	TrC_1	TrC_2	TrC_3	TrC_4	TrC_5	TrC_6	TrC_7	TrC_8	TrC_9	TrC_{10}	TrC_{11}	TrC_{12}	TrC_{13}	TrC_{14}	TrC_{15}
(1 0 0 0 0 0 0 0 0 0 0 0 0 0 0)	**0**	**0.9166**	**0.75**	**0.25**	**0.5**	0	0	0	0	0	0	0	0	0	0
(0 1 0 0 0 0 0 0 0 0 0 0 0 0 0)	**0.9166**	**0**	**0.50**	**0.25**	**0.0833**	0	0	0	0	0	0	0	0	0	0
(0 0 1 0 0 0 0 0 0 0 0 0 0 0 0)	**0.75**	**0.5**	**0.75**	**0.91466**	**0**	0	0	0	0	0	0	0	0	0	0
(0 0 0 1 0 0 0 0 0 0 0 0 0 0 0)	**0.5**	**0.25**	**0.75**	**0.91466**	**0**	0	0	0	0	0	0	0	0	0	0
(0 0 0 0 1 0 0 0 0 0 0 0 0 0 0)	**0.75**	**0.5**	**0.75**	**0.91466**	**0**	0	0	0	0	0	0	0	0	0	0
(0 0 0 0 0 1 0 0 0 0 0 0 0 0 0)	0	0	0	0	0	**0.75**	**0.5**	**0**	**0.9166**	**0.75**	0	0	0	0	0
(0 0 0 0 0 0 1 0 0 0 0 0 0 0 0)	0	0	0	0	0	**0.75**	**0.5**	**0**	**0.9166**	**0.75**	0	0	0	0	0
(0 0 0 0 0 0 0 1 0 0 0 0 0 0 0)	0	0	0	0	0	**0.0833**	**0.5**	**0.9166**	**0**	**0.5**	0	0	0	0	0
(0 0 0 0 0 0 0 0 1 0 0 0 0 0 0)	0	0	0	0	0	**0.0833**	**0.5**	**0.9166**	**0**	**0.5**	0	0	0	0	0
(0 0 0 0 0 0 0 0 0 1 0 0 0 0 0)	0	0	0	0	0	**0.0833**	**0.5**	**0.9166**	**0**	**0.5**	0	0	0	0	0
(0 0 0 0 0 0 0 0 0 0 1 0 0 0 0)	0	0	0	0	0	0	0	0	0	0	**0**	**0.75**	**0.9166**	**0.75**	**0.75**
(0 0 0 0 0 0 0 0 0 0 0 1 0 0 0)	0	0	0	0	0	0	0	0	0	0	**0**	**0.75**	**0.9166**	**0.75**	**0.75**
(0 0 0 0 0 0 0 0 0 0 0 0 1 0 0)	0	0	0	0	0	0	0	0	0	0	**0.9166**	**0.5**	**0**	**0.0833**	**0.25**
(0 0 0 0 0 0 0 0 0 0 0 0 0 1 0)	0	0	0	0	0	0	0	0	0	0	**0**	**0.75**	**0.9166**	**0.75**	**0.75**
(0 0 0 0 0 0 0 0 0 0 0 0 0 0 1)	0	0	0	0	0	0	0	0	0	0	**0.9166**	**0.5**	**0**	**0.0833**	**0.25**
Total weight	**2.9166**	**2.1666**	**3.5**	**2.333**	**1.4999**	**1.7499**	**2.5**	**2.7498**	**1.8332**	**3**	**1.8332**	**3.25**	**2.7498**	**5.4166**	**2.75**
Total average	**0.1944**	**0.1444**	**0.2333**	**0.1555**	**0.099**	**0.1166**	**0.1666**	**0.1833**	**0.122**	**0.2**	**0.122**	**0.2166**	**0.1833**	**0.3611**	**0.1833**
Weight in percentage	**19%**	**14%**	**23%**	**16%**	**10%**	**12%**	**17%**	**18%**	**12%**	**20%**	**12%**	**22%**	**18%**	**36%**	**18%**

4.1 CONCLUSION:

From the above calculation says that the total weight in percentages are 36%, > 23%, 22%, 20%, 19%, >18 %,> 17 %,> 16%, >14%, >12 %,> 10%..This is clearly reveals that No legal rights is 36%, Lack of shelter is 23%, Forced to Begging is 22%, Health problem is 20%, Lack of education is 19%, Future is a Question mark, Public cheating, Affected by HIV/AIDS are 18%, No property is 17%, Lack of shelter is 16%, Mal nutrition is 14%, No permanent job, Stress/depression, Forcing to sex are 12%. These are the exactly the ranking of various causes of the problems of Transgender. This is the beauty of the Combined Triangular Fuzzy Cognitive Maps (Combined T_rFCM).

From this paper, we made in the first section, we have introduced to Fuzzy Cognitive Maps (FCM) and Triangular Fuzzy Cognitive Maps (TrFCMs) .In the second Section we gave the basic definitions of FCM and Triangular FCM. In Section three we have shown all the definitions for Triangular Fuzzy Cognitive Maps (TrFCM), Combined Block TrFCM and Hidden pattern of the dynamical system. In Fourth section we have analyzed the concept of the problem using Triangular Fuzzy Cognitive Maps (TrFCM). In Final Section we have given the conclusion based on our study.

5 SUGGESTIONS:

First and foremost the parents should understand their kid. After all it is not or disease. They should give their kid the moral support. That would take off the ballast and make them reach great heights. The government should take every possible step to raise the standard of their living. In the run they should not be treated differently, they are our peers, human beings. At least we to realize that we have no rights to humiliate a creature of God. A couple of caring words and a pinch of true love can make wonders of their life. The government should take special interest to provide them education, medical support and to provide reservation for Jobs etc.It is responsibility of the government to raise the awareness on the rights of the Transgender.

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