Merged FCMS Model to Study the Problems Faced by Locals Living Around Kodungaiyur Dump Yard

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Abstract

In this paper authors study the problems faced by the locals living around the dumpyard of Kodungaiyur using merged FCMs model. Here we study the health problems faced by the locals due to the dumping of solid waste. This study was carried out by taking a sample survey from around 40 persons living in and around the Kodungaiyur area. We have analysed the data using merged FCMs by taking experts opinion.

Key words : Merged Fuzzy Cognitive Maps (MFCMs) model, merged graph, merged dynamical system, initial state vectors, Hidden pattern.

1. Introduction

This paper has three section. First section is introductory in nature. In section two the problem is analysed using the new merged FCMs model. The final section gives the conclusions based on our study. The merged FCMs model functions on several experts opinion who work with some of the attributes.

However all the experts together cover all the attributes associated with the problem. Every experts opinion is given as the directed graph of the FCMs. These directed graphs are merged by the common vertices (attributes) and common edge. Thus resulting in the merged graph which serves as the directed graph of the merged FCMs. Using the merged graph the merged connection matrix is obtained which serves as the dynamical system of the merged FCMs. For more about these notions refer[1-6].

We have studied the situation prevailing around the dump yard of Kodungaiyur by field study (have visited this place over 25 times) using interviews, discussions, taking experts opinions and above all using the information from the print and electronic media.

The stench of ever burning and emanating thick smoke, every falling and scattering of waste due to winds, rains, animals and above all rag pickers who disturb the dumped waste for their livelihood has made the locals unlivable. The one lakh people who live around that area are found with red (or blood shot eyes) some have watery eyes, they cough and sneeze and their skins are also affected. It is important to say that out of every five children in the age group from one to eighteen at least four of them have skin problems. Almost all residents have one or other form of respiratory problems.

Many say they suffer from headache, dizziness and hypertension. This was evident for we can say most of the locals whom we interviewed or held discussion with where touchy; we have to be diplomatic and very tolerant to avoid any form of unpleasant situation. Here we are mainly concerned only with the pollution caused by the burning of the waste and the effect of the chemicals present in them causing several types of health hazards. We have taken only a few of the chemicals present in the thick smoke emanated by the burning of the solid waste. In section two we study the health hazards on locals and the related chemicals which causes them.

We after consulting with several of the experts have taken the following nodes/ concepts to be relevant. The experts who have given their opinion are doctors/ medical representatives, NGOs, chemists, teachers, public both old and young; environmentalists who are experts in analysis of air pollution and other interested public not the locals. These experts were mainly used to get the relevant nodes for our merged FCMs model.

The main health problems suffered by them and the main chemicals found in the smoke emanated due to the burning of the dump yard at Kodungaiyur is as follows which are taken as the attributes for the New Merged FCMs model:

C_1 – Dizziness and headache

C_2 – Dizziness, nausea and vomiting

C_3 – Exhaustion, sleeplessness, drowsiness (or inactive) anxiety and muscle weakness

C_4 – Cough and lung related diseases

C_5 – Hypertension and depression

C_6 – Eye irritation, redness of eyes, blurred visions and watering of eyes

C_7 – Blocked nose throat irritation cough and breathlessness

C_8 – Some fainted and went into coma

C_9 – Skin burns, skin irritations and over all skin problems

C_{10} – Cancer related chemical found in the smoke from the Kodungaiyur dump yard

C_{11} – Problems associated with kidney lungs and tumors etc.

C_{12} – Chloromethane present in the smoke emanated by burning of the waste in the dump yard at Kodungaiyur was known Carcinogens.

C_{13} – 1-3 Butadiene was found to be 17 (ug/m^3)

C_{14} – Carbon Disulphide present in the smoke

C_{15} – Ethanol, Benzene, Toluene, Styrene and D-limonene present in the smoke

Since this problem involves a lot of feelings suffered by the people we at the outset are justified in using in general FCMs and in particular merged FCMs as they involve many attributes.

2. The New Merged FCMS Models to study the problems of the locals :

In this section we proceed on to use the newly constructed merged FCMs model described and developed[5,6]. We use four experts to work with the merged FCMs.

Now four experts have opted to work with the problem using a selected set of attributes from the 15 attributes using FCMs model. We use the integrated merged FCMs to study the problem using these four experts,

Suppose the first expert E_1 works with the nodes

$$X_1 = \{C_2, C_3, C_6, C_9, C_{11}, C_{13}, C_{14}\} \subseteq C.$$

Let the second expert E_2 work with the nodes

$$X_2 = \{C_1, C_3, C_5, C_8, C_{10}, C_{13}, C_{11}, C_{12}\} \subseteq C,$$

the expert E_3 works with the nodes

$$X_3 = \{C_4, C_7, C_8, C_{10}, C_{11}, C_{13}, C_{15}, C_{14}\} \subseteq C$$

and the forth expert E_4 works with the nodes

$$X_4 = \{C_2, C_3, C_7, C_{10}, C_9, C_{12}, C_{15}\} \subseteq C.$$

We get the experts directed graph and the connection matrices of the four experts E_1, E_2, E_3 and E_4 in the following:

The directed graph and the connection matrix of FCM model given by the first expert E_1 using the nodes $X_1 = \{C_2, C_3, C_6, C_9, C_{11}, C_{13}, C_{14}\} \subseteq C$ is as follows:
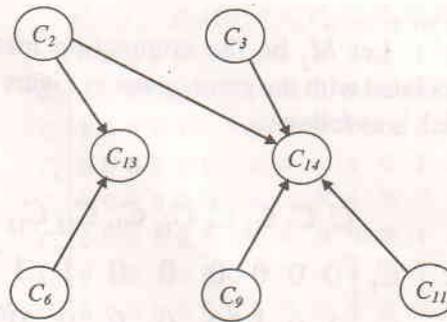

Figure 2.1

The connection matrix M_1 related with the directed graph G_1 is as follows:

$$M_1 = \begin{array}{c} \\ C_2 \\ C_3 \\ C_6 \\ C_9 \\ C_{11} \\ C_{13} \\ C_{14} \end{array} \begin{array}{c} C_2\ C_3\ C_6\ C_9\ C_{11}\ C_{13}\ C_{14} \\ \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{array}.$$

Next we find the second expert E_2's opinion using the nodes $X_2 = \{C_1, C_3, C_5, C_8, C_{10}, C_{13}, C_{11}, C_{12}\} \subseteq C$. The directed graph is given in Figure 2.2 in the following:
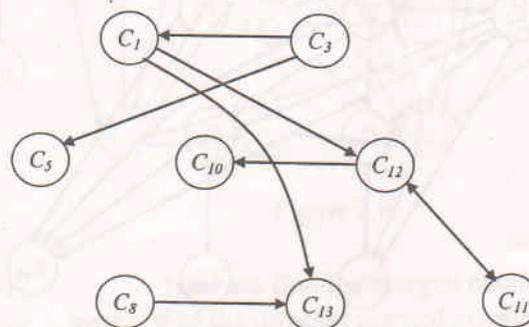

Figure 2.2

Let M_2 be the connection matrix associated with the graph given in Figure 2.2 which is as follows:

$$M_2 = \begin{array}{c} \\ C_1 \\ C_3 \\ C_5 \\ C_8 \\ C_{10} \\ C_{11} \\ C_{12} \\ C_{13} \end{array} \begin{array}{c} C_1\ C_3\ C_5\ C_8\ C_{10}\ C_{11}\ C_{12}\ C_{13} \\ \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{array}$$

Now we proceed onto give the directed graph given by the third expert E_3 using the set of nodes $X_3 = \{C_4,\ C_7,\ C_8,\ C_{10},\ C_{11},\ C_{13},\ C_{15},\ C_{14}\} \subseteq C$ is given in Figure 2.3.
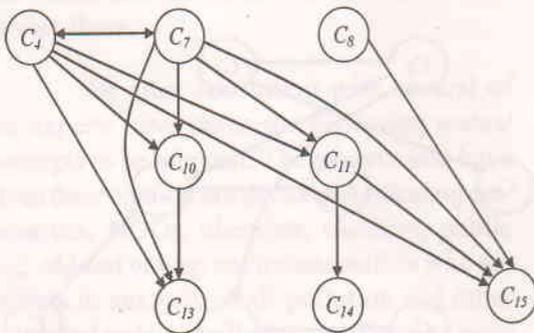

Figure 2.3

The connection matrix associated with them be M_3 which is as follows:

$$M_3 = \begin{array}{c} \\ C_4 \\ C_7 \\ C_8 \\ C_{10} \\ C_{11} \\ C_{13} \\ C_{14} \\ C_{15} \end{array} \begin{array}{c} C_4\ C_7\ C_8\ C_{10}\ C_{11}\ C_{13}\ C_{14}\ C_{15} \\ \begin{bmatrix} 0 & 1 & 0 & 1 & 1 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{array}$$

Now we proceed onto give the opinion of the forth expert E_4 using the nodes $X_4 = \{C_2,\ C_3,\ C_7,\ C_{10},\ C_9,\ C_{12},\ C_{15}\} \subseteq C$.

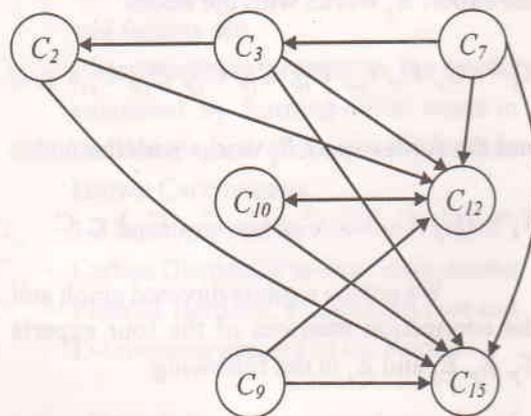Let Figure 2.4 give directed graph given by the fourth expert.

Figure 2.4

Let M_4 be the connection matrix of the directed graph given in Figure 2.4.

$$M_4 = \begin{array}{c} \\ C_2 \\ C_3 \\ C_7 \\ C_9 \\ C_{10} \\ C_{12} \\ C_{15} \end{array} \begin{array}{c} \begin{array}{ccccccc} C_2 & C_3 & C_7 & C_9 & C_{10} & C_{12} & C_{15} \end{array} \\ \left[\begin{array}{ccccccc} 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 1 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{array} \right] \end{array}$$

$$N = \begin{array}{c} \\ C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \\ C_6 \\ C_7 \\ C_8 \\ C_9 \\ C_{10} \\ C_{11} \\ C_{12} \\ C_{13} \\ C_{14} \\ C_{15} \end{array} \begin{array}{c} \begin{array}{ccccccccccccccc} C_1 & C_2 & C_3 & C_4 & C_5 & C_6 & C_7 & C_8 & C_9 & C_{10} & C_{11} & C_{12} & C_{13} & C_{14} & C_{15} \end{array} \\ \left[\begin{array}{ccccccccccccccc} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{array} \right] \end{array}$$

Now we can get two merged FCMs using expert 1, 2 and 3 or using all the experts. We will study both the merged FCMs and analyze whether they are different or one and the same.

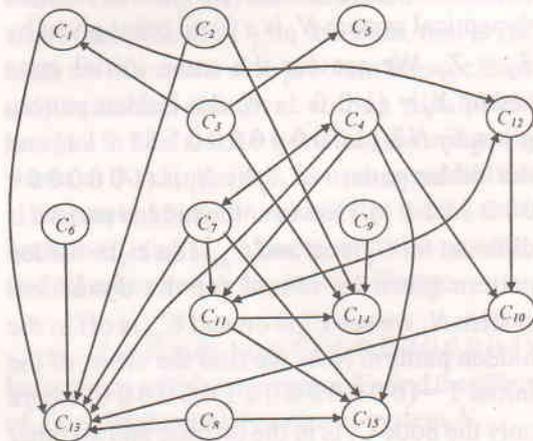The merged FCMs directed graph using experts 1, 2 and 3 is given in Figure 2.5. which is as follows:

Figure 2.5

The merged connection matrix associated with this merged graph of the three experts is as follows:

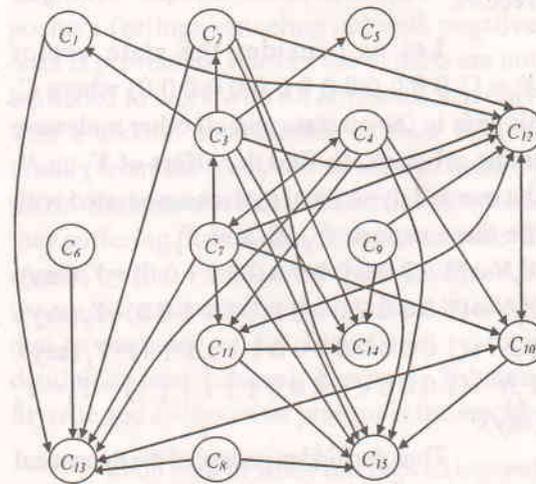Next we find the merged graph of the four experts which is given in Figure 2.6.

Figure 2.6

Now we find the merged connection matrix N of the directed merged graphs of all the four experts which is given in the following:

$$\begin{array}{c} \\ C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \\ C_6 \\ C_7 \\ N_1 = C_8 \\ C_9 \\ C_{10} \\ C_{11} \\ C_{12} \\ C_{13} \\ C_{14} \\ C_{15} \end{array} \begin{array}{c} C_1\,C_2 C_3\;C_4 C_5\;C_6\;C_7\;C_8 C_9\;C_{10}\;C_{11} C_{12}\;C_{13}\;C_{14}\;C_{15} \\ \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \end{array}$$

Now using these two merged connection matrices of the merged dynamical systems we proceed onto work with some initial state vectors.

Let us consider the state vector $X_1 = (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0)$ where C_1 alone is in the on state and all other nodes are in the off state. To find the effect of X_1 on N_1 the merged dynamical system associated with the three experts E_1, E_2 and E_3.

$X_1 N \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 0\ 0) = Y_1$ (say).

$Y_1 N \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 0\ 0) = Y_2$ (say).

$Y_2 N \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 1) = Y_3$ (say).

$Y_3 N \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 1) = Y_4 = Y_3$ (say).

Thus the hidden pattern of the dynamical system is a fixed point given by the resultant state vector $Y_3 = (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 1)$. Thus if C_1 node, that is dizziness and headache alone is in the on state; in the resultant we see the nodes C_{10} to C_{15} alone come to on state which implies the headache and dizziness may

be a cause of cancer related chemicals found in the smoke emanated by the burning of the waste at Kodungaiyur denoted by C_{10}. This also relates to problems associated with the lungs and kidney which has come to on state of C_{11}. The cause for headache and dizziness may be due to the presence of Chloromethane present in the smoke emanated from the burning of the dump yard denoted by the node C_{12} is a cause of the headache and dizziness. Likewise C_{13}, C_{14} and C_{15} are all the consequences of the burning of the waste at the Kodungaiyur dump yard.

Let us study the effect of $X_1 = (1\ 0\ 0\ \ldots\ 0)$ on the merged dynamical system N_1 which gives the opinion of all the four experts

$X_1 N_1 \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 0\ 0) = Z_1$ (say)

$Z_1 N_1 \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 0\ 0) = Z_2$ (say)

$Z_2 N_1 \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 1) = Z_3$ (say)

$Z_3 N_1 \to (1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 1) = Z_4 (= Z_3$ say)

Thus the hidden pattern the merged dynamical system N_1 is a fixed point given by $Z_4 = Z_3$. We see for the same initial state vector $X_1 = (1\ 0\ 0\ \ldots\ 0)$ the hidden pattern given by N is $(1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1\ 1\ 1)$ and the hidden pattern of X_1 by N_1 is $(1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 1)$. However the hidden pattern is different for C_9 is off and C_{10} is on in the hidden pattern given by N and for the dynamical system N_1 we see C_9 is on and C_{10} is off in the hidden pattern. Now we find the effect of the initial $T = (0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ 0\ 0)$ where only the node C_9 is in the on state and all other nodes are in the off state on both the merged dynamical systems N and N_1.

$TN \to (0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ 0) = X_1$

$X_1 N \to (0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ 0) = X_2 (= X_1)$.

Thus the hidden pattern given by T on the merged dynamical system N is a fixed point given by $X_1 = (0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 0\ 0\ 1\ 0)$.

Now we find the hidden pattern of T on the merged dynamical system N_1.

$TN_1 \rightarrow (0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 0\ 1\ 0\ 1\ 1) = Y_1$

$Y_1N_1 \rightarrow (0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 0\ 1\ 1) = Y_2$

$Y_2N_1 \rightarrow (0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 0\ 1\ 1) = Y_3 = Y_2$.

Thus the hidden pattern of the merged dynamical system is a fixed point given by $Y_2 = (0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 0\ 1\ 1)$. Thus we see both the merged dynamical systems gives distinct hidden patters for C_{11}, C_{12}, C_{13} and C_{15} are on in case of the merged dynamical system associated with the merged connection matrix N_1.

The second set of merged dynamical systems associated with N_1 makes on all the nodes related with the chemicals present smoke. The merged dynamical system associated with N makes only C_{14} to the state, that is for these set of experts skin problem is associated only with the chemical carbon disulphide present in the smoke got from burning the waste at Kodungaiyur. Let us consider the initial state vector in which the initial state vectors C_2 and C_{15} alone are in the on state and all other nodes are in the off state.

Let $Y = (0\ 1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1)$ be the given initial state vectors. To find the effect of Y on the merged dynamical system N.

$YN \rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1) = X_1$

$X_1N \rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1) = X_2 = (X_1)$

is a fixed point. Now we find the hidden pattern given by the merged dynamical system N_1.

$YN_1 \rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 0\ 1\ 1\ 1\ 1) = S_1$

$S_1N_1 \rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 1) = S_2$

$S_2N_1 \rightarrow (0\ 1\ 0\ 0\ 0\ 0\ 0\ 1\ 0\ 1\ 1\ 1\ 1\ 1) = S_3 = (S_2)$

Thus the hidden pattern given by the merged dynamical system N_2 is a fixed point. We see the resultants are distinct. Thus we see in conclusion we have worked with various combinations of initial state vectors.

Next we proceed onto work with the other types of pollutions and its hazardous effects on the people living around the Kodungaiyur dumpyard.

3. Conclusions and Suggestions :

At the outset, by using this new model, we are able to give each and every expert the same status in providing the solution. Secondly this model is better than the Combined Fuzzy Cognitive Maps (CFCMs) as the possibility of positive feelings canceling out with negative ones is prevented. Further the experts are not burdened to work with all attributes, but only with a section of attributes of their choice. Finally from our study the on state of node C_1 that is dizziness and headaches is due to smoke, they suffering from kidney, lung tumors etc. is caused by the: Presence of chloromethane in the smoke emanated by the constant burning, due to presence of 1-3 Butadiene, carbon disulphide and Ethanol, Benzene, Toluene, Styrene and D-limonene present in the smoke.

Such type of study has proved beyond doubt that all the problems faced by the locals is due to the dumping and the constant burning of the solid waste.

Further conclusions are also given behind each working in section 2. It is suggested

that the government uses some experts in waste management to dispose the mountain of wastes collected in these 30 years.

Further as it is the responsibility of the government to save the people, the government should implement a health drive scheme by which one lakh people in the neighborhood are given free medical aid and free periodic medical check ups because of the health hazards faced by them due to the carelessness of the state.

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