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Study on Impact of Social Networks on Family Values Using Fuzzy Relational Mapping (FRM)

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Abstract:

In this paper we bring out the depth of Impact of Social networks like Facebook, Whatsapp, Twitter, Snap chat etc which are the outcomes of technological development and have both constructive and destructive mechanism. Social networking allows people to ignore their feelings and obligations to the people around them. Here, we use FRM model to study and analyze the impact of Social networks on Family Values.

Key words: Fuzzy Relational maps (FRM) Social Networks, Family values

FUZZY RELATIONAL MAPS

The new notion called Fuzzy Relational Maps (FRMs) was introduced by Dr. W. B. Vasantha and Yasmin Sultana in the

year 2000. In FRMs we divide the very casual associations into two disjoint units, like for example the relation between a teacher and a student or relation between an employee and an employer or a relation between the parent and the child in the case of school dropouts and so on. In these situations we see that we can bring out the casual relations existing between an employee and employer or parent and child and so on. Thus for us to define a FRM we need a domain space and a range space which are disjoint in the sense of concepts. We further assume no intermediate relations exist within the domain and the range space. The number of elements in the range space need not in general be equal to the number of elements in the domain space.

In our discussion the elements of the domain space are taken from the real vector space of dimension n and that of the range space are real vectors from the vector space of dimension m (m in general need not be equal to n). We denote by R the set of nodes $R_1, \ldots, R_m$of the range space, where $R_i = \{(x_1, x_2, \ldots, x_m) / x_j = 0 \text{ or } 1\}$ for i = 1, … ,m. If $x_i = 1$ it means that the node R_i is in the ON state and if $x_i = 0$ it means that the node R_i is in the OFF state.

Similarly D denotes the nodes $D_1,\ldots,D_n$ of the domain space where $D_i = \{(x_1,\ldots, x_n) / x_j= 0 \text{ or } 1\}$ for i = 1, …, n. If $x_i = 1$, it means that the node D_i is in the on state and if $x_i = 0$ it means that the node D_i is in the off state.

A FRM is a directed graph or a map from D to R with concepts like policies or events etc. as nodes and causalities as edges. It represents casual relations between spaces D and R. Let D_i and R_j denote the two nodes of an FRM. The directed edge from D to R denotes the causality of D on R, called relations. Every edge in the FRM is weighted with a number in the set {-1, 1}.

Let $e_{i\,j}$ be the weight of the edge D_iR_j,$e_{\,i\,j} \in \{-1,1\}$. The weight of the edge D_iR_j is positive if increase in D_i implies increase in R_j or decrease in D_i implies decrease in R_j. i.e.

causality of D_i on R_j is 1. If $e_{ij} = 0$ then D_i does not have any effect on R_j. We do not discuss the cases when increase in D_i implies decrease in R_j or decrease in D_i implies increase in R_j. When the nodes of the FRM are fuzzy sets, then they are called fuzzy nodes, FRMs with edge weights (0, 1) are called simple FRMs.

Let $D_1 \ldots D_n$ be the nodes of the domain space D of an FRM and $R_1, \ldots, R_m$ be the nodes of the range space R of an FRM.

Let the matrix E be defined as $E = (e_{ij})$ where $e_{ij} \in \{-1, 1\}$; is the weight of the directed edge D_iR_j (or R_jD_i), E is called the relational matrix of the FRM.

It is pertinent to mention here that unlike the FCMs, the FRMs can be a rectangular matrix; with rows corresponding to the domain space and columns corresponding to the range space. This is one of the marked differences between FRMs and FCMs.

Let $D_1 \ldots D_n$ and $R_1, \ldots, R_m$ be the nodes of an FRM. Let D_iR_j (or R_jD_i) be the edges of an FRM, $j = 1 \ldots m$, $i = 1 \ldots n$. The edges form a directed cycle if it possesses a directed cycle. An FRM is said to be acycle if it does not possess any directed cycle.

An FRM with cycles is said to have a feed back when there is a feed back in the FRM, i.e. when the casual relations flow through a cycle in a revolutionary manner the FRM is called a dynamical system.

Let DiRj (or R_jD_i), $1 \le j \le m$, $1 \le i \le n$. When R_j (or D_i) is switched on and if causality flows through edges of the cycle and if it again causes $R_i(D_j)$, we say that the dynamical system goes round and round. This is true for any node R_i (or D_j) for $1 \le i \le m$, (or $1 \le j \le n$).

The equilibrium state of this dynamical system is called the hidden pattern. If the equilibrium state of the dynamical system is a unique state vector, then it is called a fixed point. Consider an FRM with $R_1 \ldots R_m$ and $D_1 \ldots D_n$ as nodes. For

example let us start the dynamical system by switching on R_1 or D_1. Let us assume that the FRM settles down with R_1 and R_m(or D_1 and D_n) on i.e. the state vector remains as (10…01) in R [or (10…01) in D], this state vector is called the fixed point.

If the FRM settles down with a state vector repeating in the form $A_1 \rightarrow A_2 \rightarrow \ldots \rightarrow A_i \rightarrow A_1$ or ($B_1 \rightarrow B_2 \rightarrow \ldots \rightarrow B_i \rightarrow B_1$) then this equilibrium is called a limit cycle.

METHODS OF DETERMINATION OF HIDDEN PATTERN

Let $R_1 \ldots R_m$ and $D_1 \ldots D_n$ be the nodes of a FRM with feed back. Let E be the $n \times m$ relational matrix. Let us find a hidden pattern when D_1 is switched on i.e. when an input is given as vector A_1= (1000...0) in D the data should pass through the relational matrix E. This is done by multiplying A_1 with the relational matrix E. Let $A_1E = (r_1 \ldots r_m)$ after thresholding and updating the resultant vector (say B) belongs to R. Now we pass on B into E^T and obtain BE^T. After thresholding and updating BE^T we see the resultant vector say A_2 belongs to D. This procedure is repeated till we get a limit cycle or a fixed point.

DESCRIPTION OF THE PROBLEM

A family has at most times been a private territory. No matter what happen outside of it, for example at work or elsewhere, a family, in principle is where many people can share their problems, seek for solutions together, enjoy understanding and privacy. However, as technology has become more and more advanced, this private intimate space has shrunk. Today, in the era of social networks, relationships in many families have changed, since social media affects these relationships in a number of unexpected and sometimes negative ways.

The world of technology and communication has changed rapidly during this millennium era. Information and communication technology has become the major role to bring

the world into a more modern and developed one. Information and communication technology has also shaped the world to be more dynamic than even before. Social networking or social media such as Facebook, Twitter, What Sapp, and other alike is also a product of the development of Information and Communication technology. Online social networking has gained worldwide popularity and growth. It is a popular form of communicating with persons around every corner of the world. It has become one of the top forms of communication ever before the phone. It has both advantages as well as disadvantages. Moreover, a study on the media influence done by the kaiser family foundation shows that young people from the age of 8 to 18 years old tend to spend about seven hours a day using entertainment media, which makes a total of approximately 50 hours per week. It means that during this time, they are not exercising, hanging out, communicating with their families or getting involved in intimate relationships. Such a lifestyle develops difficulties in establishing with parents siblings and other family members. They study suggests that such young people often tend to be mentally absent when being with a group of friends or family.

Attributes related to the domain space

CREATES A FALSE SENSE OF CONNECTION:

Social media sites can make it more difficult for us to distinguish between the meaningful relationships we foster in the real world, and the numerous casual relationships formed through social media. By focusing so much of our time and psychic energy on these less meaningful relationships our most important connections will weaken. Many people are prone to depression, lower grades, psychological disorder and future health problems etc. due to the false sense of connection.

PRIVACY BEING VIOLATED:

Data scraping involves people's activities online and harvesting personal data and conversations from social media, job websites and online forums. Data harvesters don't ask for the owner's consent and this raises online privacy problem.

It has been found that certain online appsleak identifying information about those who are using them, to advertising and internet tracking companies. Thus, the online privacy and safety are put at risk. Since usage of social networks involves lots of risk like this, many times parents violate the privacy of their children and this creates problem in their relationship.

LEADS TO DIVORCE:

The effect of social media on couple's marriage can be drastic. It can be a point of contention which could even leads to divorce. Social networking can also ruin relationship as people may get jealous if they find out their spouse exchanging messages with other people. Connecting with people in the past can cause issues such as lack of trust and honesty in a relationship.

LEADS TO VIRTUAL COMMUNITY LIFE:

As people spend increasing amount of time on social networks, they experience less face-to-face interaction. It tends to draw people away from the real world. Social networking allows people to ignore their feelings, and obligations to the people around them overall social media seem to have a negative impact of families and their relationship with each other.

LEADS TO SUICIDE:

According to the present survey almost around 6 to 7 youngsters are committing suicide per day. Social networking is also a reason behind this. Because the information and photos being shared on the social networks are misused, leading to depression and psychological problem. Finally, the person loses

hope and falls into attempting suicide. It involves morphing, sexual harassment, Blackmailing by stealing the person photos etc.

CAUSES NEGATIVE HEALTH RISK:

Hyper-networking (more than three hours on social networking per day) and Hyper- texting (more than 120 text message per day) Correlated with unhealthy behaviours in teens, including drinking, Smoking, and Sexual activity. Hyper-networking was also associated with depression, poor sleep patterns, Suicide and poor academic performance.

RISK OF FRAUD:

One of the major issues concerning data acquisition in online social networking is the problem of fake user data or even entirely fake profiles. Many Online users provide fake data in their user profiles, some profiles do not represent a person who exists in real life. Because of this there is a chance of getting cheated by the fake ID holders.

TIME WASTER:

Many companies have blocked the usage of social networking sites during working hours. This is because the employees misuse the working hours by spending time in social media. Once they started using that, time will move very fast. Other works committed being ruined. Even studies are being affected due to this. Student waste most of their times spending here and thus lack concentration in studies.

Attributes related to the range space

INTIMACY:

Intimacy is the glue that holds families together. It's what connects us over the years and across the miles. It's what gets us through the hard times. It's the grease that smooth's the

rough in the actions of everyday life, and the honey that makes it all worth it.

CONFIDENTIALITY:
As a member of a family, each person should know to keep certain information confidential, unless they have consent to disclose it or there is risk of harm to others in the family.

COMPANIONSHIP:
Companionship is when you feel a sense of closeness being with another person. A feeling of fellowship or togetherness is companionship.

ADVICE-SEEKING:
It's a sort of respect that we give to elders in the family. It makes the bond stronger and prevent us from many problems.

ADJUSTMENT AND UNDERSTANDING:
These are the most important values which each and every individual in the family should possess. Understanding about each member in the family and adjusting with their nature possess an everlasting joy and happiness in the family.

NURTURANCE:
It is the emotional and physical nourishment and care given to each one in the family.

BONDING:
Bonding among each member of the family makes their relationships much stronger.

Using the expert's opinion we have the following relational matrix. We have $D_1,D_2,D_3,D_4,D_5,D_6,D_7,D_8$ as the rows and $R_1,R_2,R_3,R_4,R_5,R_6,R_7$ are the columns.

FRM MODEL TO STUDY ABOUT THE IMPACT OF SOCIAL NETWORKS ON FAMILY VALUES

Now using the linguistic questionnaire and expert's opinion following attributes associated with impact of social networks on family values is listed. Thus the impacts of social networks are taken as the domain space and the family values as the range space of FRM. In choosing the attributes there is no hard and fast rule. It is left to the choice of any researcher to include or exclude any of the attributes.

Attributes related to the domain space D given by $D=\{D_1, D_2,\ldots,D_8\}$

- D_1 - Creates a false sense of connection
- D_2 - Privacy being violated
- D_3 - Leads to divorce
- D_4 - Leads To virtual community life
- D_5 - Leads to suicide
- D_6 - Causes negative health risks
- D_7 - Risks of fraud
- D_8 - Time waster

Attributes Related to the Range space R given by $R=\{R_1,R_2,R_3,\ldots R_7\}$

- R_1 - Intimacy
- R_2 - Confidentiality
- R_3 - Companionship
- R_4 - Advice-seeking
- R_5 - Adjustment and understanding
- R_6 - Nurturance
- R_7 - Bonding

Now we study the effect of state vectors on the dynamical system M.

$$M = \begin{pmatrix} -1 & 1 & 0 & 1 & 0 & 1 & -1 \\ -1 & 1 & -1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ -1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 \\ -1 & 0 & 0 & 0 & 0 & 0 & 0 \end{pmatrix}$$

Suppose the expert wishes to study the ON state of the node D_1, and all other node are in the off state. Let the state vector be X = (1 0 0 0 0 0 0 0). The effect of X on the dynamical system M is given by,

X M= (-1 1 0 1 0 1 -1) =Y(say)

$Y M^T$ = (5 2 0 1 0 2 1 1) (1 1 0 1 0 1 1 1) = X_1 (says)

Where →denote that the resultant state vector $Y^T$is updated and threshold (i.e) all negative values and 0 should be replaced by 0 and all positive values greater than or equal to one are replaced by 1. By updating we mean the coordinate which we started in the ON state should remain in the ON state till the end.

Now we find that

X_1 M = (-4 2 -1 3 0 2 -1)

(0 1 0 1 0 1 0) = Y_1(say)

Y_1M^T= (3 1 0 0 0 2 1 0)

(1 1 0 0 0 1 1 0) = X_2 (say)

X_2M= (-2 2 – 1 3 0 2 -1)

(0 1 0 1 0 1 0)

(1 1 0 1 0 1 0) Y_2 (say)

Y_2M^T= (2 0 0 -1 0 2 1 -1)

(1 0 0 0 0 1 1 0) =X_3(say)

X_3M= (-1 1 0 3 0 2 -1)

(0 1 0 1 0 1 0) = (1 1 0 1 0 1 0) =Y_3(say)

Y_3M^T= (2 0 0 -1 0 2 1 -1)

(1 0 0 0 0 1 1 0) = X_4(say) =X_3

Thus the hidden pattern gives a fixed pair given by {(1 0 0 0 0 1 1 0), (1 1 0 1 0 1 0)}

Thus, when the node creates a false sense of connection in the domain space is kept ON, we see that this makes the nodes D_6 (Causes negative health risks) and D_7 (Risks of fraud) to come to ON state in the domain space and R_1, R_2, R_4 and R_6 in ON state in range space.

Thus we see that except the nodes D_6 andD_7 all other nodes came to OFF state. This reveals that if a person falls in false sense of connection certainly he/she may have negative health risks and also there is a risk of fraud due to false sense of connection. Further it also reveals that R_3(Companionship), R_5(Adjustment and Understanding) an and R_7(Bonding) do not come to ON state which clearly shows that if a person falls into false sense of connection, he has no companionship, adjustment and understanding and bonding with the family.

Next the node privacy being violated is kept in the ON state and the hidden pattern is obtained by the following method.

Let X= (0 1 0 0 0 0 0 0)

XM= (-1 1 -1 0 0 0 0) = Y (say)

YM^T= (2 3 0 1 0 0 0 1)

(1 1 0 1 0 0 0 1) = X_1(say)

X_1M = (-4 2 -1 1 0 1 -1)

(0 1 0 1 0 1 0) =Y_1(say)

Y_1M^T= (3 1 0 0 0 2 1 0)

(1 1 0 0 0 1 1 0) =X_2

X_2M = (-2 2 -1 3 0 2 -1)

(0 1 0 1 0 1 0) = Y_2(say)

Y_2M^T= (3 1 0 0 0 2 1 0)

(1 1 0 0 0 1 1 0) = X_3(say) =X_2

Thus the hidden pattern gives the fixed point given by {(1 1 0 0 0 1 1 0), (0 1 0 1 0 1 0)}

When the node privacy being violated is kept in the ON state in the domain space, we see that the nodes D_1(Creates a false sense of connection), D_6(Causes negative health risks) and D_7(Risks of fraud) remains in the ON state.

This shows that when privacy is violated, automatically it creates a false sense of connection, Risks of fraud and negative health risks. Further when we note in the range space, the nodes R_2, R_4 and R_6 remains on.(i.e) In the family, when privacy is violated children will become more confidential and hide their problems to the parents and also when privacy is violated much, it makes the children to seek the advice of someone else in the family which may lead to many other problems in the family. Since privacy is violated it clearly shows that they care about their children.

CONCLUSION

1. Every person should know the value of his own family (if an individual understands spending time with family that becomes his priority).
2. A strong bond should be developed with each member in the family.
3. A Secured platform should be provided for the users in order to safeguard themselves from hackers
4. Social network activities can be exchanged with family members.
5. An individual should allot a monthly or weekly vacation or hangouts with his/her family frequently disconnecting themselves from social network activities.

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