METRICES GENERATED FORM THE SEMI- METRIC ON FUZZY MATRICES

Dr.S.SUBRAMANI[1],K.GANAMBIGAI[2],Dr.S.SANGEETHA[3],P.MALLIGA[4]

Department of Mathematics
Dhanalakshmi Srinivasan College of
Arts and Science for Women (Autonomous)
Perambalur

ABSTRACT

This article deals with Fuzzy matrix theory is a mathematical theory developed by Dr.W.B .Vasantha kandasamy , florentin smarandache ,k.ilantheral and others.The basic concept of the theory is that the mathematical matrices can be applied to social and natural situations to predict likely outcomes.The mathematics in fuzzy matrix theory is very simple and can be used to analyze a broad range of data.

INTRODUCTION

This paper aims to assist social scientists to analyze their problems using fuzzy models. The basic and essential fuzzy matrix theory is given. The paper does not promise to give the complete properties of basic fuzzy theory or basic fuzzy matrices. Instead, the authors have only tried to give those essential basically needed to develop, the fuzzy model. The authors do not present elaborate mathematical theories to work with fuzzy matrices. Instead they have given only the needed properties by way of examples. The authors feel that the paper should mainly help social scientists, who are interested in finding out ways to emancipate the society. Everything is kept at simplest level and even difficult definitions, have been omitted. Another main feature of this paper is the description of each fuzzy model using examples from real-word problems. Further. This paper gives lots of reference so that the interested reader can make use ofthem.

Keywords;

Fuzzy sets,normalized fuzzy sets,rough sets,fuzzy matrices

DEFINITION

Define a relation ‘’ on (A, B) =0. M_n (F by setting A B, if and only if d

THEOREM

The relation’’ is an equivalence relation on M_n (F) .

PROOF:

(i) d (A,A)=0

$$A + A_m = 0 \Leftrightarrow A_m + A_m = 0$$

$$\Leftrightarrow A_m = 0$$

A=0

(i) A A A in M_n (F)

Reflexivity istrue,

(ii) A B d(A,B)=0 d(B,A)=0

B A (i.e.) A B B A

Symmetric is true.

(iii) A □ B □ d(A,B)=0 □ $\| A \|_m = \| B \|_m$

B □ C □ d (B, C) =0 □ $\| B \|_m = \| C \|_m$

C □ A □ d(C, A) =0 $\| C \|_m = \| A \|_m$

□

□ A □ B and B □ C □ A □ C

□ Transitive is true.

□ Is an equivalence relation on $M_n(F)$.

DEFINITION

Let [A] denote the equivalence class containing A in $M_n(F)$. Let C= {[A]/A□ $M_n(F)$ }

(i.e.) C is the collection of all equivalence classes in $M_n(F)$.

THEOREM

The mapping f: C □ C□ [0, 1] defined as f {[A], [B]} =d (A,) is a metric on C.

PROOF:

(i) To show that f is well- defined

(i.e.) To show that f is independent of elements chosen.

If $A^{'}$ □ [A] and $B^{'}$ □ [B]then A and $A^{'}$ □ $B^{'}$ B □

(i.e.) d (A, $A^{'}$) =0 and d (B, $B^{'}$) =0

□ d(A, B) +d ($A^{'}$, $B^{'}$) =0

□ d(A, B) = $d(A', B')$ =0

(i.e.) f {[A], [B]} =f {[A'],[B']}

Thus, f is well defined.

(ii) f{[A],[B]} □ 0 since d(A,B) □ 0

(iii) f{[A],[B]}=0, if and only if [A]=[B] For [A] = [B] □ A □ B □ d (A, B)=0
(i.e.) f {[A], [B]} = 0

Conversely, f {[A], [B]} = 0

□ D (A,B) = 0 □ A □ B □ [A] =[B]

(iv) f{[A],[B]} = d(A,B) □ d(A,C)+d(C,B) □ f{[A],[C]}+f{[C],[B]}

(i.e.) f {[A], [B]} □ f{[A],[C]}+f{[C],[B]} for every [A],[B],[C] □ C

Thus, f is a metric on C.

From (ii) (iii) and (iv) f is a natural metric on C.

Thus, we get a full metric space C form a pseudo-metric space $M_n(F)$.
(i.e.) (c, f) is a metric space.

CONCLUSION

In this see we give some basic matrix theory essential to make the book a self-contained one. However, the book of Paul. Horst on matrix algebra for social scientists would be a boon to social scientists who wish to make use of matrix theory in their analysis.

We give some very basic matrix algebra. This is need for the development of fuzzy matrix theory and the psychological problems.

However, these fuzzy models have been used by applied mathematicians, to study social and psychological problems. These models are very much used by doctors, engineers, scientists, industrialists and statisticians. Here we proceed on to give some basic properties of matrixtheory.

BIBLIOGRAPHY

1) **Allen. J.Bhattachary, S.** and **smaranclache. F**. *Fuzziness and funds allocation in portfoliooptimization.*

2) **Appel. K. and Haken. W**. *The solution of the four colour map problem.* Scientific American,1977.

3) **Adlassnig. K.P.,***fuzzy set theory in medical Diagnosis,* IEEE Trans. Systems, man. Cybernetics,1986.

4) **Axe lord, R.** (ed) *Structure of Decision. The cognitive maps of political Elites.*PrincetonUniversity press, New Jersey,1976.

5) **Bala Krishnan. R.,** and **Paul raja, P.,***Line graphs of subdivisiongraphs*, J. combin. Info. And sys. Sci,1985.

6) **Birkhoff.G.,***Lattice Theory*, American Mathemal society, 1979.

7) **Buckley. J.**., and **Hajashi, Y.,***fuzzy Neural Network*: A survey, fuzzy sets and systems,1994.