

Accepted Manuscript

Title: Commentary on “Calculating fuzzy inverse matrixusing fuzzy linear equation system”

Author: Jagdeep Kaur Amit Kumar

PII: S1568-4946(17)30198-9

DOI: <http://dx.doi.org/doi:10.1016/j.asoc.2017.04.026>

Reference: ASOC 4159

To appear in: *Applied Soft Computing*

Received date: 18-3-2016

Revised date: 11-3-2017

Accepted date: 14-4-2017



Please cite this article as: Jagdeep Kaur, Amit Kumar, Commentary on “Calculating fuzzy inverse matrixusing fuzzy linear equation system”, *Applied Soft Computing Journal* (2017), <http://dx.doi.org/10.1016/j.asoc.2017.04.026>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Commentary on “Calculating fuzzy inverse matrix using fuzzy linear equation system”

Jagdeep Kaur¹, Amit Kumar

School of Mathematics
Thapar University, Patiala-147 004, India

Abstract Basaran [Calculating fuzzy inverse matrix using fuzzy linear equation system, Applied Soft Computing, 12 (2012), 1810-1813] proposed a method for finding the inverse of a fuzzy matrix by assuming all the elements of the fuzzy inverse matrix as non-negative fuzzy numbers, while some of the elements of fuzzy matrix inverse may also be negative fuzzy numbers. Keeping the same in mind, Mosleh and Otadi [A discussion on Calculating fuzzy inverse matrix using fuzzy linear equation system”, Applied Soft Computing, 28 (2015), 511-513] assumed $(i, j)^{th}$ element $\tilde{x}_{ij} = (x_{ij}, \alpha_{ij}, \beta_{ij})$ of the fuzzy inverse matrix as a non-negative fuzzy number if the value of x_{ij} obtained by Basaran’s approach, is a non-negative real number and a negative fuzzy number if the value of x_{ij} is negative real number. In this paper, it is shown that the fuzzy multiplicative inverse of a fuzzy matrix, obtained by considering this assumption, is also not an exact fuzzy multiplicative inverse. Furthermore, the required modifications, in Mosleh and Otadi’s approach, to obtain the exact multiplicative inverse of a fuzzy matrix are suggested.

1 Basaran’s Approach

Basaran [1] proposed the following approach to find the multiplicative fuzzy inverse of a fuzzy matrix $\tilde{A} = [(a_{ij}, \gamma_{ij}, \delta_{ij})]_{n \times n}$.

Step 1: Let $\tilde{X} = [(x_{jk}, \alpha_{jk}, \beta_{jk})]_{n \times n}$ be the multiplicative fuzzy inverse matrix of fuzzy matrix $\tilde{A} = [(a_{ij}, \gamma_{ij}, \delta_{ij})]_{n \times n}$ and \tilde{I} be the identity fuzzy matrix of order $n \times n$ having diagonal elements $(1, \alpha, \beta)$ and remaining elements $(0, \gamma, \delta)$. Then,

$$\tilde{A} \otimes \tilde{X} = \tilde{I} \quad (P1)$$

which can be written as

$$\sum_{j=1}^n (a_{ij}, \gamma_{ij}, \delta_{ij}) \otimes (x_{jk}, \alpha_{jk}, \beta_{jk}) = \begin{cases} (1, \alpha, \beta), & i = k; \\ (0, \gamma, \delta), & i \neq k. \end{cases} \quad (P2)$$

where $i, k = 1, 2, \dots, n$

Step 2: Assuming $(a_{ij}, \gamma_{ij}, \delta_{ij}) \otimes (x_{jk}, \alpha_{jk}, \beta_{jk}) = (m_{ik}, \rho_{ik}, \phi_{ik})$, equations (P2) can

¹Corresponding author: sidhu.deepi87@gmail.com, amitkdma@gmail.com

Download English Version:

<https://daneshyari.com/en/article/4963177>

Download Persian Version:

<https://daneshyari.com/article/4963177>

[Daneshyari.com](https://daneshyari.com)