



Solving Fuzzy LR Interval Linear Systems Using Ghanbari and Mahdavi-Amiri's Method

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Abstract

Here, we propose a method for solving fuzzy LR interval linear systems with fuzzy coefficients matrix and fuzzy hand-right vector based on the method proposed by Ghanbari and Mahdavi-Amiri for solving fuzzy LR linear systems.

Keywords: Fuzzy LR interval, Fuzzy LR interval linear systems, Least squares model.

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1 Introduction

Ghanbari and Mahdavi-Amiri in [1] developed the method for solving fuzzy LR triangular linear systems $A\tilde{x} = \tilde{b}$ based on a least squares model. Here, we study the following fuzzy LR interval linear systems:

$$\tilde{A}x = \tilde{b}. \quad (1)$$

To compute an approximate or an exact solution for (1), the proposed method is inspired by Ghanbari and Mahdavi-Amiri's method [1].

2 Basic Concepts and Notations

Definition 2.1. [4] A fuzzy interval $\tilde{a}$ is of LR type, if there exist shape functions L and R (for left and right), and scalars $\alpha \geq 0$, $\beta \geq 0$ and a_l and a_r with the following membership function

$$\mu_{\tilde{a}}(x) = \begin{cases} L\left(\frac{a_l - x}{\alpha}\right), & a_l - \alpha \leq x \leq a_l, \\ 1, & a_l \leq x \leq a_r, \\ R\left(\frac{x - a_r}{\beta}\right), & a_r \leq x \leq a_r + \beta, \\ 0, & o.w. \end{cases}$$

The corresponding membership function of a fuzzy LR interval $\mu_{\tilde{a}}(x)$, denoted by $(a_l, a_r, \alpha, \beta)_{LR}$.

Definition 2.2. [4] Let $\tilde{a} = (a_l, a_r, \alpha, \beta)_{LR}$, $\tilde{b} = (b_l, b_r, b_\theta, b_\gamma)_{LR}$ and $\delta \in \mathbb{R}$. Then:

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