Common Fixed Point Theorems for Multi-Fuzzy Mappings via Weak Contractive Conditions in MR-Metric Spaces

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Abstract

In this paper, we study common fixed point results for multiple fuzzy mappings in the framework of MR-metric spaces. By introducing a weaker weighted-sum contractive condition, we establish the existence and uniqueness of common fixed points for four and six fuzzy mappings in a complete MR-metric space. Using a cyclic iterative construction together with the Hausdorff MR-metric structure, we prove the convergence of the generated sequence and demonstrate that all the mappings admit a unique common fixed point. The proposed results extend and strengthen existing fixed point principles by relaxing contraction assumptions and expanding the theory to multi-mapping settings. These findings further advance the development of fixed point theory in generalized metric spaces and provide a broader foundation for applications in fuzzy analysis, optimization, and uncertainty modeling.

Keywords

Fixed point, fuzzy mapping, MR-metric space, MR-metric, contraction principle.

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