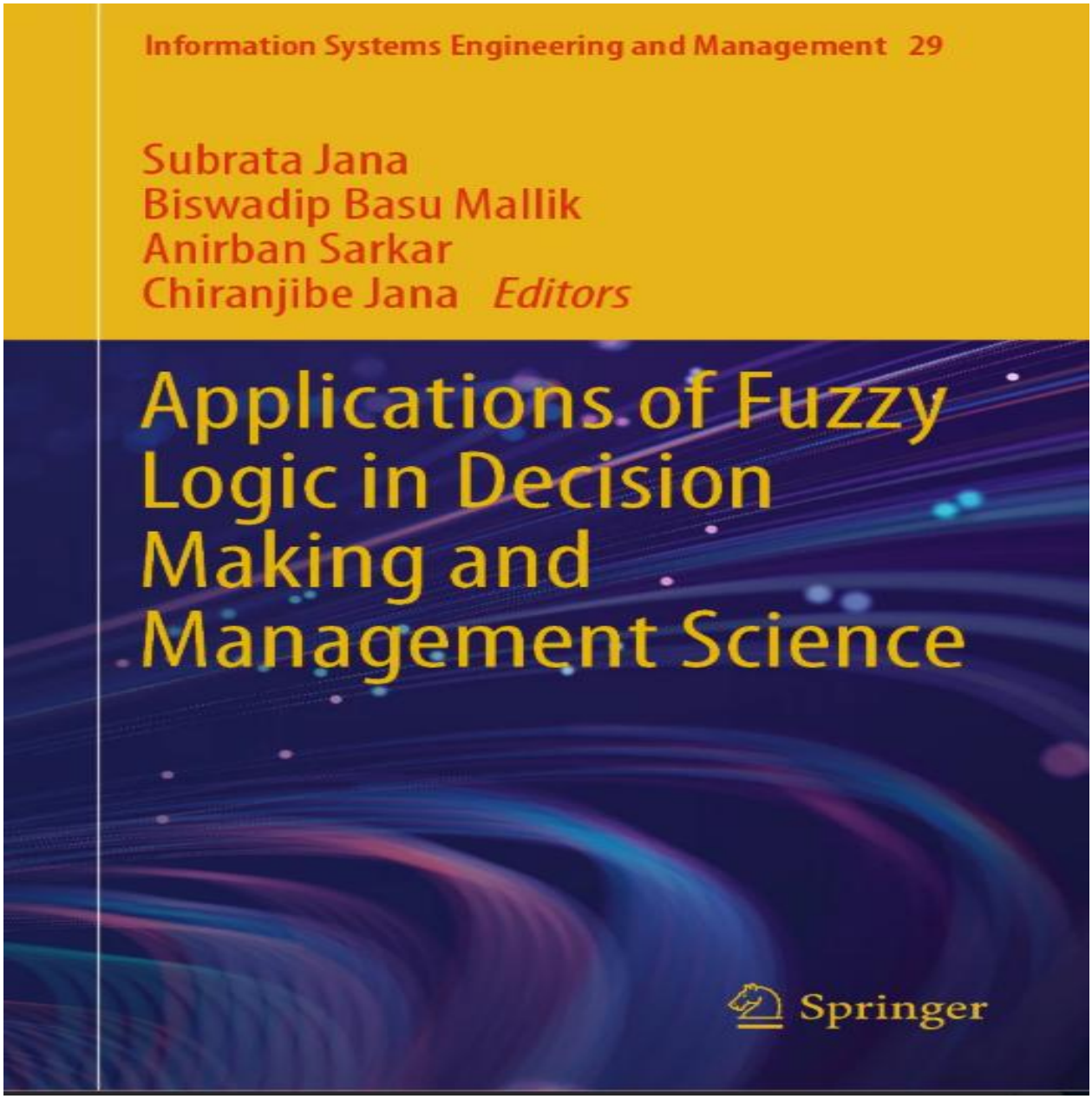
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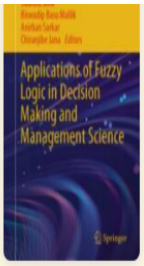

Applications of Fuzzy Logic in Decision Making and Management Science

Syed Adnan Afaq, Shweta Dwivedi, Mohammad Faisal, Subrata Jana, Ummey Habiba & Mohammed Siddique

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Abstract

Fuzzy logic provides a powerful tool for addressing the complexities and uncertainties in multicriteria decision-making (MCDM) problems. Allowing for degrees of truth effectively handles the vagueness inherent in human judgments and subjective evaluations. In MCDM, fuzzy logic employs fuzzy sets and membership functions to represent linguistic variables like "high," "medium," and "low." Key methodologies include fuzzy aggregation operators and fuzzy multi-attribute utility theory, which integrate individual criterion evaluations into a comprehensive decision metric. Applications span diverse fields such as engineering, economics, environmental management, and healthcare, where it aids in evaluating alternatives under uncertain conditions. Fuzzy logic's ability to capture and process imprecise information enhances the robustness and flexibility of MCDM