Advancements in Fuzzy Logic: Mathematical Frameworks for Uncertainty Management in AI and Decision-Making

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ABSTRACT

Fuzzy logic, embedded within a robust mathematical framework, stands as a key solution for managing uncertainty and imprecision, particularly in situations where traditional binary logic proves too limiting. Recognized for its versatility, fuzzy logic finds critical applications in AI, control systems, and decision-making. This symposium aims to provide an in-depth exploration of the well-established areas of fuzzy differential equations, fuzzy fixed point theorems, and fuzzy modeling while emphasizing the development and application of new tools to solve problems in these domains.

The symposium will delve into the mathematical and theoretical foundations of fuzzy sets, focusing on their well-established principles and extending them to address emerging challenges. It delves into managing uncertainties present in real-world data and systems by developing theories, principles, and methodologies. This includes fundamental principles of fuzzy set theory such as membership functions, operations on fuzzy sets, and their applications in modeling uncertain information that captures and represents vagueness inherent in real-world scenarios.

Expanding the applications of fuzzy logic, the symposium will explore innovative tools and methodologies for solving problems related to fuzzy modeling. Participants will engage in discussions that highlight the latest advancements in applying fuzzy logic to diverse fields. In conclusion, this symposium seeks to bridge theory and practice by exploring new applications and tools for problem-solving within the well-established areas of fuzzy differential equations, fuzzy fixed point theorems, fuzzy modeling, and others.