Modeling Complex Dynamics: Adapting Analytical Tools for Diverse Scenarios

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Description:

Modeling complex dynamics is crucial in fields like AI, healthcare, and environmental science, where decisions must often be made with incomplete or imprecise information. Using frameworks such as fuzzy sets, rough sets, and probability theory, researchers can adapt analytical tools to handle diverse types of uncertainty. A central bridge between the physical system and its respective mathematical model is provided by differential and integral equations. They are essential tools for capturing complex phenomena, from fluid dynamics and population growth to signal processing and financial systems. This session aims to bring together experts to explore innovative methods for solving these equations in uncertain contexts. By integrating theory, computational techniques, and hybrid approaches, we aim to enhance the toolkit for dynamic modeling across complex, real-world systems.

Topics of Interest (but not limited to):

- Analytical solutions for different types of differential and integral equations
- Numerical methods and computational techniques
- Fractional differential equations
- Handling complex differential systems
- Machine learning and data-driven approaches
- Interval analysis
- Interval uncertainty

- Boundary value problems and integral transforms in solving differential equations
- Applications in different fields