

Special Issue on New Trends in Fuzzy Logic and Data-Driven Methods

CALL FOR PAPERS

The Special Issue's purpose is to present recent developments in fuzzy logic and data-driven methods. Fuzzy models and data-driven models can be found in applications in a lot of scientific fields in engineering, biology, geology, medicine and in a wide spectrum of new scientific topics, such as decision making, control systems and artificial intelligence.

Fuzzy methods and data-driven methods are both versatile topics and combine classical and applied mathematics. We consider that fuzzy connectors (i.e., fuzzy 'and', fuzzy 'or' and fuzzy negations) play a key role in the construction of fuzzy implications. Fuzzy implications are the building block of artificial intelligence. Fuzzy partial parabolic equation problems with engineering applications can be solved using Finite Differences or Finite Elements methods. Fuzzy Estimators can be used in the solution with very useful results in management problems. On the other side, with the advent of large data recordings, data-driven methods constitute a vital research area for modelling and understanding complex systems in biology, ecology, social, technological, and engineering science. Data-driven methods for complex systems allow us to build realistic models, understand emerging behaviors, and predict or control the future states of the system. Our challenge is to take the aforementioned theory to a deeper level and broaden the range of problems in which it will be applied.

The aim of this Special Issue is to cover recent developments in fuzzy modelling and in data-driven methods relevant to a broad readership from physics, mathematics, biology, and engineering. In this collection, different modelling techniques, from ordinary and partial differential equations, to agent-based models on networks, are collected to describe complex systems of interest. In this special issue we are interested in research that presents new theory and related concepts and also in research works with methods and solutions in problems of interest. We welcome original research and review articles.

Potential topics include but are not limited to the following:

- ▶ Differential Equations
- ▶ Algebra of fuzzy connectivity
- ▶ Fuzzy Implications
- ▶ Fuzzy Connectives
- ▶ Quantification of uncertainty;
- ▶ Manifold learning algorithms and model reduction methods
- ▶ Machine and deep learning for dynamical systems
- ▶ Koopman's theory for systems identification
- ▶ Control and optimisation of complex and experimental systems
- ▶ Topological data analysis
- ▶ Dynamics in networks
- ▶ Criticality and Emergent Phenomena
- ▶ Ecological, technological, and climate networks
- ▶ Traffic and crowd dynamics
- ▶ Biological networks

Authors can submit their manuscripts through the Manuscript Tracking System at <https://review.wiley.com/submit?specialIssue=940339>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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