

Special Issue

Fractional-Order Modeling in Data-Driven Intelligent Systems: From Optimization to AI/ML Applications

Message from the Guest Editors

This Special Issue provides a platform to advance theories and methodologies for scalable, intelligent systems, focusing on the intersection of optimization algorithms, Big Data infrastructure, and AI/ML algorithm design. Approaches that incorporate memory-aware modeling, such as those based on fractional-order calculus or fractal structures, are of special interest, as they offer enhanced flexibility and precision in capturing the complex dynamics of modern intelligent systems.

Topics of interest include, but are not limited to, the following:

- Fractional-order control and optimization algorithm for AI/ML
- Control theoretic analysis and design of ML algorithms (e.g., stability, robustness, convergence)
- Optimization-driven AI and ML frameworks for high-dimensional or streaming data
- Integration of optimization, control, and ML in Big Data environments
- Scalable and distributed optimization methods for large-scale ML models
- Safe and explainable AI through control and optimization perspectives
- Real-time ML and optimization for dynamic data streams in edge/cloud computing
- Interdisciplinary methods bridging optimization theory, control, and data science

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About the Journal

Message from the Editor-in-Chief

Fractal and Fractional (*Fractal Fract.*) is a scholarly online journal which provides a forum for discussion on new original models and methods in fractals and fractional calculus both from theory and applications. It is a peer-reviewed, open access journal that publishes high quality original research articles, review papers and short communications.

Editor-in-Chief

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manuscripts are peer-reviewed and a first decision is provided to authors approximately 19.9 days after submission; acceptance to publication is undertaken in 2.7 days (median values for papers published in this journal in the first half of 2025).