Special Issue

Advanced Optimization Algorithms in the Era of Machine Learning

Message from the Guest Editor

We are witnessing the rapid advance of Machine Learning and its application in various domains. We would like to provide the opportunity to explore related areas that focus on the development of alternative optimization algorithms that provide a different perspective on machine learning. In the scope of the Special Issue are methods for lower bound approximations and stochastic relaxations of discrete problems; adjoint methods of optimization problems; solver free learning of optimization problems; optimization free gradient estimation methods; continuous relaxations of discrete operations and algorithms (e.g., sorting, ranking, argmax, shortest-path, if-else constructs, loops, top-k, logic operators, indexing, etc.); Smoothing or variational for the optimization of discrete structures (e.g., graphs, tree, sequences); Semi-definitive optimization relaxation of discrete or logical optimization (e.g., SAT solver, MaxSAT), Optimization and integration of numerical simulators (e.g., field equations, fluid dynamics, differentiable molecular dynamics, differentiable particle simulators, differentiable protein binding, differentiable protein-folding).

Guest Editor

Dr. Francesco Alesiani
Machine Learning for Computational Science Group, NEC Laboratories Europe, 69115 Heidelberg, Germany

Deadline for manuscript submissions

30 April 2026

Mathematics

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 4.6

mdpi.com/si/175074

Mathematics
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
mathematics@mdpi.com

mdpi.com/journal/mathematics

Mathematics

an Open Access Journal by MDPI

Impact Factor 2.2
CiteScore 4.6

mdpi.com/journal/mathematics

About the Journal

Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

Editor-in-Chief

Prof. Dr. Francisco Chiclana
School of Computer Science and Informatics, De Montfort University, The Gateway, Leicester LE1 9BH, UK

Author Benefits

High Visibility:

indexed within Scopus, SCIE (Web of Science), RePEc, and other databases.

Journal Rank:

JCR - Q1 (Mathematics) / CiteScore - Q1 (General Mathematics)

Rapid Publication:

manuscripts are peer-reviewed and a first decision is provided to authors approximately 18.4 days after submission; acceptance to publication is undertaken in 2.4 days (median values for papers published in this journal in the first half of 2025).

MDPI