

Special Issue

Implementation and Performance of Artificial Intelligence Systems

Message from the Guest Editor

The universal popularity and exploding energy consumption of large-scale artificial intelligence models such as LLMs pose a potentially insoluble problem to our societies. The proliferation of Large Language Models (LLMs) has marked a paradigm shift in artificial intelligence. However, their immense computational and memory requirements present a significant barrier to their widespread deployment. The operational costs, energy consumption, and hardware demands associated with running these models at scale are substantial. Consequently, research into model compression and optimization has become a critical field of study. In this Special Issue, we invite researchers and practitioners to submit their work on the measurement, modeling and optimization of the energy costs for ML/AI training and inference. Predicting computation time is part of predicting the energy cost of a given computation. Work on parallel-distributed performance modeling is thus also welcome if it is applied to general AI or more specifically very large models. We also welcome up-to-date critical literature surveys on this topic of great scientific, technological and ecological importance.

Guest Editor

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Deadline for manuscript submissions

31 May 2026



Mathematics

an Open Access Journal
by MDPI

Impact Factor 2.2
CiteScore 4.6



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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.

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