

## Special Issue

# Mathematical Perspectives on Generalization and Optimization in Machine Learning

### Message from the Guest Editor

Machine learning systems have reached an impressive level of performance in a wide range of applications, often well beyond what was expected just a few years ago. We invite papers that approach these problems from a mathematical perspective, including studies on generalization properties of deep or stochastic models, analyses of optimization dynamics and implicit regularization, and investigations into the stability and robustness of learning algorithms. Contributions on the mathematical basis of explainable and interpretable AI are also welcome, as are works connecting machine learning to neighboring areas such as information theory or statistical mechanics. Many modern learning settings—overparameterized networks, stochastic components in training, ensemble methods, or reinforcement learning—do not fit neatly into classical assumptions, and understanding them requires new tools. The objective of this Special Issue is not only to present new theoretical results but also to encourage work that helps clarify the mechanisms behind contemporary learning methods.

---

### Guest Editor

Dr. Carlo Metta

Institute of Information Science and Technologies (ISTI-CNR), Via Moruzzi 1, 56127 Pisa, Italy

---

### Deadline for manuscript submissions

31 October 2026



---

## Mathematics

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.2  
CiteScore 5.4



[mdpi.com/si/268368](https://mdpi.com/si/268368)

*Mathematics*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[mathematics@mdpi.com](mailto:mathematics@mdpi.com)

[mdpi.com/journal/  
mathematics](https://mdpi.com/journal/mathematics)





# Mathematics

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.2  
CiteScore 5.4



[mdpi.com/journal/  
mathematics](https://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 17.3 days after submission; acceptance to publication is undertaken in 2.8 days (median values for papers published in this journal in the second half of 2025).