

# Special Issue

## Data-Driven Modelling and Optimisation with Applications

### Message from the Guest Editor

This Special Issue focuses on the emerging frontiers of data-driven modelling and optimisation where classical assumptions no longer suffice—such as in high-dimensional, multi-agent, or physics-constrained systems. We aim to showcase work that leverages the underlying structure of complex systems—e.g., sparsity, symmetry, conservation laws—to design adaptive, interpretable, and scalable modelling and optimisation frameworks. We invite contributions that go beyond black-box machine learning and instead integrate mathematical insight with data-driven innovation. Topics of interest include (but not limited to) the following:

- Physics-informed machine learning for inverse problems;
- Learning-to-optimize and theory of data-driven optimisers;
- Structure-aware algorithms for reinforcement learning and agent-based models;
- Theoretical foundations for deep learning and physics-informed learning on manifolds;
- Scalable optimisation in high dimensions;
- Interpretable and structure-aware AI models.

This Issue aims to engage applied mathematicians, machine learning theorists, and domain scientists working at the interface of modelling, data, and optimisation.

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### Guest Editor

Dr. Junqi Tang

School of Mathematics, University of Birmingham, Birmingham, UK

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### Deadline for manuscript submissions

20 April 2026



## Mathematics

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

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## 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.

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### Editor-in-Chief

Prof. Dr. Francisco Chiclana

School of Computer Science and Informatics, De Montfort University,  
The Gateway, Leicester LE1 9BH, UK

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