

# Special Issue

## Modelling and Estimation in Digital Twins

### Message from the Guest Editors

Digital twinning is the coupling between a dynamic system (physical asset) and its computerised model (digital asset). The scope of this is to allow for prediction and optimisation of operations via the digital asset over the lifetime of the physical one. This, in turn, requires that the computerised model is promptly calibrated so that its response matches as close as possible the behaviour of the physical asset via a continuous cycle of sensor data assimilation and model prediction, tracking the temporal evolution of the physical system. This framework is rooted in inverse problems and mathematical modelling under uncertainty, and finds applications in automation of manufacturing processes, structural health monitoring and biomedical signal and image processing, among other areas. This Special Issue aims to bring together articles discussing recent algorithmic advances in mathematical modelling and inverse problems of high-dimensional and complex systems. Articles on topics in real-time simulation, model order reduction, online learning, scalable uncertainty quantification and data-driven models are particularly welcome.

### Guest Editors

Dr. Nicholas Polydorides

Computational Engineering, School of Engineering, University of Edinburgh, Edinburgh, UK

Dr. Dimitris Kamilis

School of Engineering, University of Edinburgh, Edinburgh, UK

### Deadline for manuscript submissions

closed (30 November 2021)



## 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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