

ADVANCED MATHEMATICAL MODELING, METHODS AND ALGORITHMS FOR SUSTAINABILITY

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ABSTRACT

Societal changes (e.g., climate change, increase in food demand, migrations, traffic congestion) are happening at a fast pace. Predicting and controlling such large-scale events is becoming more and more important and requires a multidisciplinary outlook. In addition, all these contexts offer us a huge amount of data, which often remains under-employed, thus leading to ineffective decisions.

The employment of advanced mathematical models and the construction of ad-hoc algorithms to analyze the environment, the society and its development is a key-point for assessing scientific non-trivial solutions on existing problems. Despite still being an unexplored territory for many research areas, mathematics can be beneficial for sustainability in many contexts, by providing a new comprehension of the real world, suitable tools for the optimization of products and processes, new algorithms to extract decisional information from data, the development of devices to control the effectiveness of the proposed solutions.

In this minisymposium, we aim at providing the ideal domain to discuss the most innovative research and engineering practices to foster a sustainable development. We encourage contributions addressing different issues, ranging from data-driven smart agriculture to biological cellular modelling in plant growth, from reducing energy consumption of buildings to limiting light pollution in cities, from meteorology and environmental analyses to innovative processes to tackle pollution issues, from green energy production to traffic congestion management, from satellite data exploitation to monitor infrastructures to digital twin practice for predictive maintenance.