Special Issue

Advances in Modelling for Additive Manufacturing

Message from the Guest Editors

The topic of Additive Manufacturing has seen a dramatic increase in research activity in recent years, with significant attempts to better understand processes at a fundamental level, develop hardware and software technologies that will enable better process monitoring, control and optimisation, as well as develop computational frameworks to ensure robust manufacture. At the core of many research efforts is the non-trivial task of development and use of mathematical models to capture and understand process-powder-part behaviours. A range of mathematical modelling methods are used, such as physics-driven analytical and numerical methods as well as data-driven methods relying on data-science and machine learning attempts. In this special issue, we aim to exemplify state-of-the-art modelling approaches with application to additive manufacturing, towards demonstrations of better understanding underlying AM physics and processes, as well as demonstrations of standalone models or integrated model-based systems that aim to monitor, control or optimise an AM process.

Guest Editors

Dr. George Panoutsos

Department of Automatic Control and Systems Engineering, University of Sheffield, Sheffield S10 2TN, UK

Prof. Dr. Hector Basoalto

Department of Materials Science and Engineering, University of Sheffield, Sheffield S10 2TG, England

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Applied Sciences
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
applsci@mdpi.com

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As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

Editor-in-Chief

Prof. Dr. Giulio Nicola Cerullo
Dipartimento di Fisica, Politecnico di Milano, Piazza L. da Vinci 32, 20133 Milano, Italy

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