Joint Special Issue
Additive Manufacturing: Experiments, Simulations and Data-Driven Modelling

Message from the Guest Editors

Additive manufacturing (AM) utilizes a layer-upon-layer technique to produce three-dimensional (3D) components via a computer-aided design (CAD) model, promising manufacturing advantages compared to conventional approaches, such as manufacturing intricate geometries, controlling the heat-affected zone and removing numerous technological steps; thus, reducing the final manufacturing cost. AM has been explored in automotive, biomedical, aerospace and industrial applications based on the facts mentioned above, and has been widely applied to various materials, including metals, ceramics, polymers and ceramic-reinforced metal matrix composites (CMMCs), a mixture of metals and ceramics. In AM, operating conditions influence the properties of the manufactured parts and the in-service life. One way to determine the optimum operating conditions is to conduct a series of experiments by utilizing the trial-and-error method, increasing the manufacturing direct and indirect costs. On the other hand, this can be performed by using an experimentally validated simulation model linked with data-driven models (machine learning), leading towards smart manufacturing.

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