Special Issue

Advances in Virtual Prototyping of Mechanical Systems for Design and Manufacturing

Message from the Guest Editors

Virtual Prototyping (VP) refers to the development of digital models that simulate the behavior and performance of physical systems, allowing evaluation and testing before any physical prototype is built. VP fosters collaboration by streamlining feedback loops and bridging the gap between product design and manufacturing. It accelerates time-to-market by identifying design flaws and production issues early in the life cycle, while also supporting rapid iterations and modifications. By enabling comprehensive multiphysics simulations, VP contributes to improved product quality. Furthermore, it significantly reduces costs by reducing the need for expensive physical prototypes and minimizing downtime caused by trial-and-error setups on the shop floor. In addition, VP promotes innovation by encouraging risk-free experimentation and enhances the reliability of design processes by leveraging optimization techniques to effectively manage system parameters.

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