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Autore	Chouchane Mnaouar
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Altri autori (Persone)	AbdennadherMoez AifaouiNizar ChaariFakher BouazizSlim AffiZouhaier HaddarMohamed RomdhaneLotfi BenamaraAbdelmajid
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Approach: Optimization of the Mechatronic Systems V-Model -- Chapter 2. Topological optimization of an automotive steering column lever -- Chapter 3. Hybrid metaheuristic optimization algorithm for the synthesis of a flexible four bar mechanism -- Chapter 4. Robot arm trajectory synthesis based on metaheuristic optimization techniques -- Chapter 5. Assembly path planning with collision avoidance -- Chapter 6. CAD-based methods for the modeling of planar parts assemblies with flatness defects -- Chapter 7. End of life disassembly plans of mechatronic systems based on energy consumption -- Chapter 8. Efficient tolerance for mechanical assemblies with interrelated dimension chains in a circular economy perspective -- Chapter 9. Tolerance analysis for the assembly of non-rigid parts with form defects -- Chapter 10. Automatic Generation of Dimensional Tolerance from Mating Relations Represented in Assembly Models -- Chapter 11. Numerical study of the bending of prestressed concrete beams: contribution of iron-based SMA -- Chapter 12. Numerical investigation on the inelastic instability of cruciform columns: Effect of material and geometric parameters -- Chapter 13. 3D finite element model for simulation of mechanical and electrochemical effects on corrosion defect of pipeline -- Chapter 14. Non-linear response of an intelligent FGP-MEE tapered panel -- Chapter 15. Phase-field regularized cohesive zone numerical modeling -- Etc...

Sommario/riassunto

This book offers a collection of original peer-reviewed contributions presented at the 10th International Congress on Design and Modeling of Mechanical Systems (CMSM'2023), held on December 18-20, 2023, in Hammamet, Tunisia. It reports on a wide spectrum of research findings, advanced methods and industrial applications relating to mechanical system behavior and vibration analysis. A special emphasis is given to numerical modeling and CFD simulation. Moreover, the book covers a set of industrial engineering problems and solutions, and applications of machine learning and artificial intelligence, e.g. in predictive maintenance. Continuing on the tradition of the previous editions, and with a good balance of theory and practice, this first volume of a 2-volume set offers a timely snapshot, and a useful resource for both researchers and professionals in the field of design and modeling of mechanical systems.
