

1. Record Nr.	UNINA9910838279403321
Autore	Kramer Charlotte L. B
Titolo	Additive and Advanced Manufacturing, Inverse Problem Methodologies and Machine Learning and Data Science, Volume 4 : Proceedings of the 2023 Annual Conference & Exposition on Experimental and Applied Mechanics / / edited by Charlotte L.B. Kramer, Emily Retzlaff, Piyush Thakre, Johan Hoefnagels, Marco Rossi, Attilio Lattanzi, François Hemez, Mostafa Mirshekari, Austin Downey
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	87-438-0420-9 87-438-0052-1 3-031-50474-7
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (101 pages)
Collana	Conference Proceedings of the Society for Experimental Mechanics Series, , 2191-5652
Altri autori (Persone)	RetzlaffEmily ThakrePiyush HoefnagelsJohan RossiMarco LattanziAttilio HemezFrancois MirshekariMostafa DowneyAustin
Disciplina	670
Soggetti	Industrial engineering Production engineering Machine learning Artificial intelligence - Data processing Materials - Analysis Industrial and Production Engineering Machine Learning Data Science Materials Characterization Technique
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

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Chapter 1. Quantifying residual stresses generated by laser powder bed fusion of metallic samples -- Chapter 2. Loading-Unloading Compressive Response and Energy Dissipation of Liquid Crystal Elastomers and Their 3D Printed Lattice Structures at Low and Intermediate Strain Rates -- Chapter 3. Residual Stress Induced in Thin Plates During Additive Manufacturing -- Chapter 4. Investigating the Effects of Acetone Vapor Treatment and Post Drying Conditions on Tensile and Fatigue behavior of 3D Printed ABS Components -- Chapter 5. Mechanics of Novel Double-Rounded-V Hierarchical Auxetic Structure - Finite Element Analysis and Experiments Using Three-dimensional Digital Image Correlation -- Chapter 6. Repeatability of Residual Stress in Replicate Additively Manufactured 316L Stainless Steel Samples -- Chapter 7. Acoustic nondestructive characterization of metal pantographs for material and defect identification -- Chapter 8. Rapid prototyping of a micro-scale spectroscopic system by two-photon direct laser writing -- Chapter 9. Bioinspired Interfaces for Improved Interlaminar Shear Strength in 3D Printed Multi-Material Polymer Composites -- Chapter 10. Thermo-mechanical Characterization of High-strength Steel through Inverse Methods -- Chapter 11. A multi-testing approach for the full calibration of 3D anisotropic plasticity models via inverse methods -- Chapter 12. Finite Element Based Material Property Identification Utilizing Full-Field Deformation Measurements -- Chapter 13. Data-driven material models for engineering materials subjected to arbitrary loading paths: influence of the dimension of the dataset -- Chapter 14. Data-driven methodology to extract stress fields in materials subjected to dynamic loading.

## Sommario/riassunto

Additive and Advanced Manufacturing, Inverse Problem Methodologies and Machine Learning and Data Science, Volume 4 of the Proceedings of the 2023 SEM Annual Conference & Exposition on Experimental and Applied Mechanics, the fourth volume of five from the Conference, brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on a wide range of topics and includes papers in the following general technical research areas: AM Composites and Polymers Dynamic Behavior of Additively Manufactured Materials and Structures Joint Residual Stress and Additive Manufacturing ML for Material Model Identification Novel AM Structures Novel Processing and Testing of Additively Manufactured Materials Plasticity and Complex Material Behavior Virtual Fields Method.