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	Nota di contenuto	Chapter 1. Model Updating for Nonlinear Dynamic Digital Twins Using Data-Based Inverse Mapping Models -- Chapter 2. Deep Reinforcement Learning for Active Structure Stabilization -- Chapter 3. Estimation of Structural Vibration Modal Properties Using a Spike-Based Computing Paradigm -- Chapter 4. Environmental-Insensitive Damage Features

Based on Transmissibility Coherence -- Chapter 5. Transmittance Anomalies for Model-Based Damage Detection with Finite Element Generated Data and Deep Learning -- Chapter 6. Machine Learning based Condition Monitoring with Multibody Dynamics Models for Gear Transmission Faults -- Chapter 7. Structural Damage Detection Framework Using Metaheuristic Algorithms and Optimal Finite Element Modeling -- Chapter 8. On Aspects of Geometry in SHM and Population-Based SHM -- Chapter 9. A Robust PCA-based Framework for Long-Term Condition Monitoring of Civil Infrastructures -- Chapter 10. Data-Driven Parameter Identification for Turbomachinery Blisks -- Chapter 11. Classification of Rail Irregularities from Axle Box Accelerations using Random Forests and Convolutional Neural Networks -- Chapter 12. Development of a Surrogate Model for Structural Health Monitoring of a UAV Wing Spar -- Chapter 13. On a Description of Aeroplanes and Aeroplane Components using Irreducible Element Models -- Chapter 14. Input Estimation of Four-DOF Nonlinear Building Using Probabilistic Recurrent Neural Network -- Chapter 15. Simulation-Based Damage Detection for Composite Structures with Machine Learning Techniques -- Chapter 16. Synthesizing Dynamic Time-series Data for Structures Under Shock Using Generative Adversarial Networks -- Chapter 17. Multi-Layer Input Deep Learning Applied to Ultrasonic Wavefield Measurements.

Sommario/riassunto	Data Science in Engineering, Volume 9: Proceedings of the 40th IMAC, A Conference and Exposition on Structural Dynamics, 2022, the nineth volume of nine from the Conference brings together contributions to this important area of research and engineering. The collection presents early findings and case studies on fundamental and applied aspects of Data Science in Engineering, including papers on: Novel Data-driven Analysis Methods Deep Learning Gaussian Process Analysis Real-time Video-based Analysis Applications to Nonlinear Dynamics and Damage Detection High-rate Structural Monitoring and Prognostics.