1. Record Nr. UNINA9910949130903321

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Titolo	Mechanical Design and Simulation: Exploring Innovations for the Future : Proceedings of the 4th International Conference on Mechanical Design and Simulation / / edited by Duc Truong Pham, Yaguo Lei, Yanshan Lou
Pubbl/distr/stampa	Singapore : , : Springer Nature Singapore : , : Imprint : Springer, , 2025
ISBN	9789819778874 9819778875
Edizione	[1st ed. 2025.]
Descrizione fisica	1 online resource (1499 pages)
Collana	Lecture Notes in Mechanical Engineering, , 2195-4364
Altri autori (Persone)	LeiYaguo LouYanshan
Disciplina	620.0042
Soggetti	Engineering design Artificial intelligence Technological innovations Engineering Design Artificial Intelligence Innovation and Technology Management
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	PartApplication of Intelligent Technology to Mechanical Design -- Structural Design and Kinematic Analysis of a Three-Servo-Wheel Omnidirectional Mobile Platform -- Structural Design and Feasibility Analysis of a Double-Rotor Wheeled Wall-Climbing Robot -- Multi-stage Optimization Design Strategy of Composite Box Structure -- Design of Feed Automatic Packaging Machine with Robotic Arm -- A Method for Reconstructing Three-Dimensional Structure of Nasal Cavity Based on a Short-Source Acoustic Tube -- Design of Structure and Control System of All-Terrain Intelligent Agricultural Picking Robot -- Optimization Design of Lifting Mechanism for Disinfection Cabinet Bowl and Basket Based on Multi Body Dynamics -- Research on the Design and Control of Tendon-Driven Dexterous Hands -- Shipboard Lifeboat Design Based on 3D Printing Technology -- Design Method and Characteristic Analysis of an Obstacle Dismantling Robot -- Structural Design of a Two-stage Hand Rehabilitation Exoskeleton -- Mechanical

Design of An Exoskeletal Master Device for Upper-limb Rehabilitation Robot -- Scheme Design and Challenges of DNA Sequencing Terminal Equipment Based on Solid-State Nanopore Sequencing -- Key Technology and Equipment for Splitting and Grouting of Complex Geotechnical Bodies -- Structure Design of a Corner Protection Injection Mold -- Design and Realization of Defrost and Icebreaking Device for Cryogenic Connector of a Certain Rocket -- 2-UPS/RRR Ankle Rehabilitation Robot Design and Kinematic Analysis -- Crashworthiness Design of the Lower Support of the Cargo Compartment of Civil Aircrafts -- Design and Gait Control of a Quadruped Robot with a Waist Joint -- Proposal and Simulation of a Wheeled Omnidirectional Wall-climbing Robot -- System Engineering-Based Flight Simulation Device Design Technology and Application Research -- Simulation Design of Non-lethal Hollow Spherical Kinetic Energy Projectile Based on ANSYS LS-DYNA -- Research on the Structural Safety Performance of Front Fan-shaped Energy-saving Duct -- Simulation Analysis and optimization design of Small Microwave Cavity for Passive Hydrogen Maser -- Design and Simulation of EMU Traction Control System Based on Simulink -- Design of Rectangular Part Layout Optimization System Based on Standard Dimension -- Design of Automatic Recycling and Conveying System for Unpacking Tobacco Cartons in Tobacco Shreds Production Line -- Digital and Smart Assembly of Laser Target Designation Based on Digital Twin -- Evaluation Method for Multi-element Design of Civil Aircraft Cabin -- Design of Technological Process and Control System for Multi Station Stacking Equipment -- Fatigue Analysis and Optimization Design of Integrated Functional Coffee Brewing Device -- Machining Efficiency Optimization in Flank Milling of The Curved Thin-walled Workpiece with Target Machining Accuracy -- Design of Electromagnetic Environment Analysis and Simulation Deduction System for Equipment Testing -- A Fully Automatic Material Sorting Device Mechanical System Design -- Design and Implementation of a Modular Underwater Brush-Clearing Robot and its Observation Module -- Optimized Design of Guide Vanes for Vertical Upwelling in Marine Ranching: A Three-Dimensional Numerical Analysis -- Crystallinity-induced Variation of the Strength of Electroplated Copper Thin Film in Through Silicon Vias Interconnection Structure -- Design of Ceramic Conical Cover Assembly Equipment -- Structure Design and Simulation Analysis of a Load Acquisition Encoder -- Structural Design and Analysis of Lower Limb Exoskeleton Rehabilitation Robots -- Optimization and Combination Design of Spray Heads Based on Artificial Intelligence Rain System Test Platform -- Design and Implementation of Intelligent Coupled Rearview Mirror Variable Position Structure -- QFD Based Conceptual Design of Civil Aircraft Landing Gear -- Topology Optimization Design of Circular Saw Blade for Shrub Harvester -- PartAdvancements in Finite Element Analysis (FEA) for Mechanical Stress Testing -- An Analysis of Material Movement Trajectory of Eccentric Vibration Transport Equipment -- Study on Multiphase Flow in Ultrafine Powder Stirred Mill Based on CFD-DEM -- Study on Mechanical Properties of Waste ABS and PBT Blends -- Dynamics Analysis of Marine Gas Turbine Modelled Rotor -- Modelling the Thermal Characteristic Analysis Model of the Machine Tool with External Mechanical Spindle Motor -- Degradation Analysis and Reliability Assessment for Fiber Optic Gyroscope with 3-axis Dependent Degradation Processes -- Evaluation of Measurement Uncertainty for Impact Damage of Metallic Materials -- Topology Optimization of Beam Structures for 2D Problems -- Numerical Simulation of Cycloidal Propeller Performance Based on CFD -- Analysis of the Influence of Preload Loading Deviation of Pitch Bearing Bolt

Group on the Contact Stress of Rolling Elements -- Modal Analysis of Mobile Platform of Tea Garden Management Machine in Hilly and Mountainous Areas -- Dynamics Study of Mechanism with Clearance Based on Adams -- Kinematics Analysis and Optimization of Stepping Rotary Three-Dimensional Braiding Machine -- Optimization of Structural Parameters of vortex type coiled tubing drag reduction tool Based on Coanda Effect -- Effect of paddle mode on flow characteristics of a continuous stirred tank reactor (CSTR) using CFD simulations -- Analysis of the Launch Dynamics of All-terrain Rocket Artillery under Ice Conditions -- Dynamic simulation and vibration analysis of rolling bearing with outer ring defects -- Numerical Analysis Model of Contact Stress in the Raceway of Double Row Tapered Roller Bearing under Overturning Torque in Wind Turbine -- Microstructure of AZ31B alloy induced by laser shock -- A Study on the Impedance-Controlled Force Feedback Device Grasping Technique -- Force Simulation and Analysis of Magnetic-Assisted Docking Poles -- Numerical Analysis of Oil Flow Characteristics in Curved Pipes of Aero-engine Lubrication System -- Creep Prediction of Ethylene Vinyl-acetate Copolymer Support -- Lightweight Design for Interval Finite Element Structure with Improved Gray Wolf Optimization Algorithm -- Numerical Simulation of Lock-in Phenomenon of Cylinder-elastic Beam Model Based on CFD-FEM Fluid-structure Interaction Method -- Dynamic Characteristics Analysis of Prosthetic Knee Joint Based on MR Damper -- Dynamic Simulation of Suspension Span Frame under Wire Breaking Accident -- Analysis of Excitation Force on Aeroengine Blisk Structure -- Data Exchange for SysML: A Review -- Study of Computational Model for Closing Comfort of Automotive Door System Considering Work Done by Components -- Biomechanical Analysis of Forward Driving Posture Based on Human Musculoskeletal Model -- Dynamic Experimental Study of Heavy Haul Train on Mountain Railway -- Analysis of Factors Influencing the Tension Change of Electrode Wire in High Speed Wire Cutting -- Numerical Simulation Analysis of Flow Control Effect of Harbor Seal Bearded Model under Different Reynolds Numbers -- Numerical Simulation Analysis of the Flow Control Effect of Harbor Seal Bearded Model under Different Angles of Attack -- Research on Simulation and Flow Characteristics of Liquid Nitrogen Jet Fire-extinguishing Device Based on AMESim -- Optimization of Damping Groove Parameters of swashplate Plunger Pump Based on CATIA Secondary Development -- Simulation on the Back-side Crack of Nickel-based Superalloy with Eddy Current Testing -- Research on Fatigue Life Analysis of Non-standard Socket Welding Fittings and the Influence of the Weld Gap on the Weld Stress Distribution -- Mathematical Analysis on Tooth Contact of the Drum Worm Pair -- Simulation Experiment of Horizontal Disk Type Precision Seed Dispenser Based on Discrete Unit Method for Carrot Sowing -- Part Simulation-driven Mechanical Design -- Stability with Regard to Partial Variables of Stochastic Reaction-Diffusion Systems Driven by G-Brownian Motion -- Vortex-induced Vibration Analysis of a Two-Degree-of-Freedom Circular Cylinder under Pulsating Flow -- Research on Control Strategies of Anti-Surge Systems for Large Centrifugal Fans -- Study on Health Degree Assessment and Prediction for Axle Counter Equipment in Urban Rail Transit -- Simulation Study on Airbag Deployment of an Optoelectronic Buoy -- Performance Analysis of AlGaN/GaN MOS-HEMT based Biosensors -- Simulation Analysis of Energy Absorption Characteristics of Corrugated Beams in Civil Aircrafts -- Magnetic Gradient Method Simulation Study for Signal Detection outside Buried Bimetallic Pipes -- Feature Extraction Method of Rotor Fault Diagnosis in Complex Network Based on Phase Space

Method -- The Origin, Development and Innovation of the Software-Defined Telemetry System -- A Fusion Modeling Method for Ball Screw Feed System of Machine Tool -- Study on the Influencing Factors of Underwater Radiated Noise of Fin Stabilizer -- Research on the Effect of Fan Rotation Vibration on Hard Drive Disk Performance -- Mixing performance simulation of an optimized air injector -- Experimental Study on Load-Deformation Characteristics of Bolted Joints under Transverse Alternating Loads -- Construction of Bearing Performance Degradation Indicators for Adaptive Improvement of PCA -- Research on the Influence of Thermostatic Block on the Temperature Uniformity of Thermocouple Calibration Furnaces -- Chatter Prediction for In-process Machining of the Thin-walled Workpiece with Variable Curvature Considering Deformation -- Aerodynamic Damping Characteristics Analysis of Turbine Integral Blade Disk -- Analysis on the Influence of Braking Performance in Different Positions of Heavy Duty Train -- Thermal Analysis and Simulation of Protective Cover for Power Devices of BeiDou Antenna -- Research on Hydraulic Support Handling Device for Rapid Excavation -- Research on Irregular-Shaped Workpiece Fixture Based on Electrorheological Fluid -- Strength Analysis of Transmission Shaft Spline Pair u.

Sommario/riassunto

This book is an open access publication. This book presents innovative strategies and cutting-edge research at the intersection of mechanical engineering and simulation technologies. Aimed at addressing the current challenges and limitations in mechanical design, this book presents an array of advanced methodologies and tools that promise to revolutionize the field. From integrating artificial intelligence and machine learning for design optimization to leveraging the latest in finite element analysis for enhanced stress modelling, the proceedings highlight the pivotal role of simulation in pushing the boundaries of what is possible in mechanical design. With a strong emphasis on sustainable design practices and the utilization of additive manufacturing, this collection not only serves as an indispensable resource for engineers, researchers, and students but also marks a significant step forward in bridging the gap between traditional mechanical design principles and modern computational innovations.