

1. Record Nr.	UNINA9910847091203321
Titolo	25th International Symposium on Measurements and Control in Robotics : Proceedings of ISMCR 2023 / / edited by Ioan Doroftei, Balint Kiss, Yvan Baudoin, Zafar Taqvi, Simone Keller Fuchter
Pubbl/distr/stampa	Cham : , : Springer Nature Switzerland : , : Imprint : Springer, , 2024
ISBN	3-031-51085-2
Edizione	[1st ed. 2024.]
Descrizione fisica	1 online resource (266 pages)
Collana	Mechanisms and Machine Science, , 2211-0992 ; ; 154
Disciplina	615
Soggetti	Robotics Measurement Measuring instruments Manufactures Robotic Engineering Measurement Science and Instrumentation Machines, Tools, Processes
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Organization -- Preface -- Contents -- Enhancing Human Augmentation: Analysis of Behavior Change in Highly Efficient Three-Hand Body After Motor Skill Training -- 1 Introduction -- 2 3-Arm Motor Skill Training System -- 2.1 Training Environment -- 2.2 Training on Spatial Awareness -- 2.3 Training on Cooperative Action -- 3 Experiment -- 3.1 Experimental Procedure -- 3.2 Evaluation Task -- 4 Result and Discussion -- 4.1 Change in Task Behavior -- 4.2 Discussion -- 4.3 Limitations -- 5 Conclusion -- References -- NeRF-YOLO: Detecting Occluded Objects via Multi-view Geometric Aggregation -- 1 Introduction -- 2 Related Work -- 2.1 Object Detection Under Occlusion -- 2.2 Neural Radiance Fields -- 3 Methodology -- 3.1 Feature Aggregation -- 3.2 Dataset Creation -- 4 Experimental Results -- 4.1 Metrics -- 4.2 Comparative Evaluation -- 5 Conclusion -- References -- A Fast-Acting Gripper for Aerial Vehicles -- 1 Introduction -- 2 Related Works -- 3 Mechanical Design -- 3.1 Active Claws -- 3.2 Passive Claws -- 3.3 Connection Rings -- 4 Results

and Discussion -- 4.1 Materials and Fabrication -- 4.2 State Machine -- 4.3 Field Test -- 5 Conclusion -- References -- Localization of Mobile Robots. Theoretical Aspects -- 1 Introduction -- 2 Relative Localization During Navigation -- 3 Absolute Localization During Navigation -- 3.1 Modeling the Absolute Localization Process -- 3.2 Arrangement of Beacons in an Operating Scene -- 4 Conclusions -- References -- Design of a 3D Printer with Five-Bar Linkage -- 1 Introduction -- 2 Synthesis Method of the Symmetrical Five-Bar Linkage -- 3 Design of the Five-Bar Linkage for 3D Printers -- 4 A Design of the New 3D Printer -- 5 Conclusions -- References -- Kinematic Performance Analysis of the 3-U(RPRGR)RU Parallel Robot -- 1 Introduction -- 2 Description of the 3-U(RPRGR)RU Parallel Robot. 3 Kinematic Performance Analysis -- 4 Results -- 5 Conclusion -- References -- Workspace Analysis of a 3 RRR Planar Mechanism -- 1 Introduction -- 2 Mechanism Workspace -- 3 Singularities Inside of Mechanism Workspace -- 4 Conclusions -- References -- Soft Robotics: A Numerical Evaluation of Model-Based PneuNet Simulation -- 1 Introduction -- 2 Preliminaries on the Dynamics of the Simulated Actuator -- 3 Methodology -- 4 Simulation Results -- 5 Conclusions and Future Work -- References -- An Evaluation of the Dual Vectors Based Solutions for Robot-World/Hand-Eye Calibration -- 1 Introduction -- 2 Dual Vectors Based Robot-World/hand-Eye Calibration Solution -- 2.1 Problem Formulation and Mathematical Preliminaries -- 2.2 Dual Vectors Based Solutions to $AX = XB$ and $AX = YB$ Calibration Problems -- 3 Experimental Results -- 3.1 State-Of-The-Art Methods Used for $AX = XB$ Comparison -- 3.2 Results- $AX = XB$ Dual Vectors Based Approach -- 3.3 State-Of-The-Art Approach to Solve $AX = YB$ -- 3.4 Results- $AX = YB$ Dual Vectors Based Approach -- 4 Conclusions and Future Work -- References -- Sensor Selection for Mechatronic Systems Based on Closed-Loop Control Simulations -- 1 Introduction -- 2 Analysis Tool -- 2.1 Reference Signal Selection -- 2.2 Controller Options -- 2.3 Plant Model -- 2.4 Sensor Parameter Settings -- 3 Analysis Scenarios -- 3.1 Simulation of a Single Configuration -- 3.2 Iterative Analysis -- 3.3 Further Options -- 4 Simulation Results -- 4.1 Simulated System -- 4.2 Results -- 5 Conclusions -- References -- On the Control Architecture and Functional Validation of the Control System for a Lower Limb Rehabilitation Robot -- 1 Introduction -- 2 RAISE-Parallel Robot for Lower Limb Rehabilitation -- 3 RAISE Control System Architecture and Graphical Interface -- 4 Experimental Validation of the Control System and User Interface -- 5 Conclusions. References -- Equivalent Control of a 2D Crane and a 2D Drone Using Exact Linearization Based on Differential Flatness -- 1 Introduction -- 2 Background -- 2.1 Differential Flatness -- 2.2 Exact Linearization -- 3 Equivalence in the Mathematical Models of the Crane and the Drone -- 3.1 The Model of the Crane -- 3.2 The Model of the Drone -- 4 Simulations in Closed-Loop -- 5 Conclusion -- References -- LPV-Based Adaptive Control of a 2-DOF Robotic Arm -- 1 Introduction -- 2 Robotic Arm -- 2.1 Model Description -- 2.2 Polytopic LPV Model -- 3 Control Architecture -- 3.1 Unscented Kalman Filter -- 3.2 Problem Statement (Controller Synthesis) -- 3.3 LPV Controller Synthesis LMI -- 4 Simulation Results -- 5 Conclusion -- References -- Advances Representation of Higher-Order Kinematics of Motion. Hypercomplex Lie Groups and Lie Algebras -- 1 Introduction -- 2 Higher-Order Kinematics of Rigid Body and Instantaneous Invariants -- 3 Mathematical Preliminaries of Multidual Algebra, Function, Vectors, and Quaternions -- 3.1 HMD Vectors -- 3.2 HMD Euclidean Tensors -- 3.3 HMD Quaternions -- 4 Multidual Differential Transform

and Higher-Order Kinematics -- 5 Higher-Order Analysis of Lower-Pair Kinematic Chains -- 6 Conclusions -- References -- Autonomous Shuttle for Pedestrian Zones -- 1 Introduction -- 2 Embedded Systems -- 2.1 Computer Architecture -- 2.2 Safety System -- 2.3 Sensor System -- 3 Control Concept -- 3.1 Autonomous Control -- 3.2 Social Collision Behavior -- 4 Interaction System -- 5 Discussion -- References -- A Simplified-Model Predictive Controller Design for a Four-Wheel Omnidirectional Robot -- 1 Introduction -- 2 Kinematics Model of the Omnidirectional Mobile Robot -- 3 Dynamics Model of the Omnidirectional Mobile Robot -- 4 Controller Design -- 5 Simulation Results -- 6 Conclusions -- References.

Comparative Aspects Regarding the Similarities and Differences Between Industrial and Collaborative Robots -- 1 Collaborative Robots -- 1.1 Introduction -- 1.2 Sparing Human Operators (HO), Forced to Work Very Close to a Cobot -- 1.3 The Cost-Effectiveness of Cobotic Solutions Compared to Those Based on RI -- 1.4 The Comparative Technological Capability of the Two Variants and the Limits of the Cobots -- 1.5 The Alleged "User-Friendly" Character of Cobots -- 1.6 Conclusions -- References -- Human-Machine Interfaces for Industrial Robot Control: A Comprehensive Review of the State of the Art -- 1 Evolution -- 2 Classification -- 3 Manual Control -- 3.1 Teach Pendant -- 3.2 Joystick Controllers -- 3.3 Gamepad Controllers -- 3.4 Smartphone -- 3.5 Computer Software (PC/Mac) or Custom HMIs -- 3.6 Web-Based Interfaces -- 3.7 Virtual Reality (VR) Headsets -- 3.8 Augmented Reality (AR) Headsets -- 4 Sensory Input Control -- 4.1 Gesture Control Devices -- 4.2 Voice Control Devices -- 4.3 Brain-Computer Interface (BCI) -- 5 Conclusion -- References -- Preliminary Functionality Tests of an Improved Ankle Rehabilitation Device -- 1 Introduction -- 2 Functionality of the Ankle Rehabilitation Device -- 2.1 Mechanical Design -- 2.2 Preliminary Test Results for the Ankle Rehabilitation Device -- 3 Conclusions -- References -- Learning Styles Identification and Implementation in Learning Processes Using Haptic Devices -- 1 Introduction -- 2 Literature Review -- 3 The Study -- 3.1 Justification of the Study -- 3.2 Objectives -- 3.3 The Purpose of the Study -- 3.4 The Context of the Study -- 4 Implementation -- 4.1 Considerations About the Study and How It Was Conducted -- 4.2 Establishing Educational Strategies in Correlation with Learning Styles and Contents -- 4.3 Presentation of the Implementation. Results -- 5 Conclusions -- References.

Study of the Load-Response Effect of NiTi-Based Thermal Actuators. Application to a Robotic Gripper -- 1 Introduction -- 1.1 General Notions -- 1.2 Thermoelastic Martensitic Transformation in Shape Memory Alloys -- 1.3 Robotic Applications -- 2 Experimental Procedure -- 3 Experimental Results and Discussion -- 4 Conclusions -- References -- Design of a Hybrid Locomotion Mobile Manipulator for Agricultural Application -- 1 Introduction -- 2 Developed Robots for Agricultural Applications -- 3 Robot Design Criteria -- 4 Leg-Wheel Module Design -- 5 Robot Design -- 6 Conclusions -- References -- Author Index.

Sommario/riassunto

Gathering the proceedings of the 25th International Symposium on Measurement and Control in Robotics (ISMCR), held in Iasi, Romania, on September 21-22, 2023, this volume covers topics in the broad range of topics related to robotics and human robot systems, such as robot design innovations, sensors/smart sensors their integration/fusion, advanced controls and actuators, methods of AI in robotics, humanoid, climbing/walking, and autonomous robots; anthropomorphic robots, augmented/mixed/virtual reality (VR), intelligent CAD and IMS, visual/auditory/tactile/force displays, tools and techniques for

modelling VR systems, software architectures for VR, VR interaction and navigation techniques, distributed VR Systems, motion tracking, VR input and output devices, human factors in VR. The proceedings extend this platform to all researchers, scientists, industry experts, and students interested in these fields.
