

IEEE TRANSACTIONS ON ROBOTICS

A PUBLICATION OF THE IEEE ROBOTICS AND AUTOMATION SOCIETY

DECEMBER 2022

VOLUME 38

NUMBER 6

ITREAE

(ISSN 1552-3098)

REGULAR PAPERS

Model Predictive Contouring Control for Time-Optimal Quadrotor Flight	A. Romero, S. Sun, P. Foehn, and D. Scaramuzza	3340
A Comparative Study of Nonlinear MPC and Differential-Flatness-Based Control for Quadrotor Agile Flight	S. Sun, A. Romero, P. Foehn, E. Kaufmann, and D. Scaramuzza	3357
Omni-Swarm: A Decentralized Omnidirectional Visual-Inertial-UWB State Estimation System for Aerial Swarms	H. Xu, Y. Zhang, B. Zhou, L. Wang, X. Yao, G. Meng, and S. Shen	3374
TAMOLS: Terrain-Aware Motion Optimization for Legged Systems	F. Jenelten, R. Grandia, F. Farshidian, and M. Hutter	3395
Dynamic Complementarity Conditions and Whole-Body Trajectory Optimization for Humanoid Robot Locomotion	S. Dafarra, G. Romualdi, and D. Pucci	3414
RBO Hand 3: A Platform for Soft Dexterous Manipulation	S. Puhlmann, J. Harris, and O. Brock	3434
So-EAGlove: VR Haptic Glove Rendering Softness Sensation With Force-Tunable Electrostatic Adhesive Brakes	Q. Xiong, X. Liang, D. Wei, H. Wang, R. Zhu, T. Wang, J. Mao, and H. Wang	3450
Neural-Gas Network-Based Optimal Design Method for ERT-Based Whole-Body Robotic Skin	K. Park and J. Kim	3463
Active Multiobject Exploration and Recognition via Tactile Whiskers	C. Xiao, S. Xu, W. Wu, and J. Wachs	3479
Adaptive Constrained Kinematic Control Using Partial or Complete Task-Space Measurements	M. M. Marinho and B. V. Adorno	3498
Development of an Untethered Adaptive Thumb Exoskeleton for Delicate Rehabilitation Assistance	G. Li, L. Cheng, Z. Gao, X. Xia, and J. Jiang	3514
Density Control of Large-Scale Particles Swarm Through PDE-Constrained Optimization	C. Sinigaglia, A. Manzoni, and F. Braghin	3530
Byzantine Resilient Distributed Learning in Multirobot Systems	J. Li, W. Abbas, M. Shabbir, and X. Koutsoukos	3550
Closed-Loop Motion Control of Robotic Swarms – A Tether-Based Strategy	K. Eshaghi, A. Rogers, G. Nejat, and B. Benhabib	3564
Innate Motivation for Robot Swarms by Minimizing Surprise: From Simple Simulations to Real-World Experiments	T. K. Kaiser and H. Hamann	3582
Temporal Logic Task Allocation in Heterogeneous Multirobot Systems	X. Luo and M. M. Zavlanos	3602
Adaptive Multirobot Implicit Control of Heterogeneous Herds	E. Sebastián, E. Montijano, and C. Sagüés	3622
Bidirectional Sampling-Based Motion Planning Without Two-Point Boundary Value Solution	S. Nayak and M. W. Otte	3636
Adaptive Bézier Degree Reduction and Splitting for Computationally Efficient Motion Planning	Ö. Arslan and A. Tiemessen	3655
Energy Autonomy for Robot Systems With Constrained Resources	H. Fouad and G. Beltrame	3675
Autonomous Navigation in Unknown Environments With Sparse Bayesian Kernel-Based Occupancy Mapping	T. Duong, M. Yip, and N. Atanasov	3694
Directional Sensor Planning for Occlusion Avoidance	J. Gemerek, B. Fu, Y. Chen, Z. Liu, M. Zheng, D. van Wijk, and S. Ferrari	3713

(Contents Continued on Page 3339)

Observability-Aware Intrinsic and Extrinsic Calibration of LiDAR-IMU Systems	3734
..... <i>J. Lv, X. Zuo, K. Hu, J. Xu, G. Huang, and Y. Liu</i>	
A Novel Radar Point Cloud Generation Method for Robot Environment Perception	3754
..... <i>Y. Cheng, J. Su, M. Jiang, and Y. Liu</i>	
A Generalized Framework for Concentric Tube Robot Design Using Gradient-Based Optimization	3774
..... <i>J.-T. Lin, C. Girerd, J. Yan, J. T. Hwang, and T. K. Morimoto</i>	
Kinematic Modeling and Characterization of Soft Parallel Robots	3792
..... <i>X. Huang, X. Zhu, and G. Gu</i>	
Design and Optimization of a Multimode Amphibious Robot With Propeller-Leg	3807
..... <i>X. Ma, G. Wang, and K. Liu</i>	
A Soft Robot With Variable Stiffness Multidirectional Grasping Based on a Folded Plate Mechanism and Particle Jamming	3821
..... <i>H. Wei, Y. Shan, Y. Zhao, L. Qi, and X. Zhao</i>	
Malleable Robots: Reconfigurable Robotic Arms With Continuum Links of Variable Stiffness	3832
..... <i>A. B. Clark and N. Rojas</i>	
Learning to Play Table Tennis From Scratch Using Muscular Robots	3850
..... <i>D. Büchler, S. Guist, R. Calandra, V. Berenz, B. Schölkopf, and J. Peters</i>	
From Simulation to Reality: A Learning Framework for Fish-Like Robots to Perform Control Tasks	3861
..... <i>T. Zhang, R. Tian, H. Yang, C. Wang, J. Sun, S. Zhang, and G. Xie</i>	
Model-Based Policy Search Using Monte Carlo Gradient Estimation With Real Systems Application	3879
..... <i>F. Amadio, A. Dalla Libera, R. Antonello, D. Nikovski, R. Carli, and D. Romeres</i>	
Safety-Aware Hierarchical Passivity-Based Variable Compliance Control for Redundant Manipulators	3899
..... <i>Y. Michel, C. Ott, and D. Lee</i>	
An Energy-Based Control Architecture for Shared Autonomy	3917
..... <i>F. Benzi, F. Ferraguti, G. Riggio, and C. Secchi</i>	
Energy Aware Impedance Control of a Flying End-Effector in the Port-Hamiltonian Framework	3936
..... <i>R. Rashad, D. Bicego, J. Zult, S. Sanchez-Escalonilla, R. Jiao, A. Franchi, and S. Stramigioli</i>	
