

# **2022 IEEE International Conference on Robotics and Automation (ICRA 2022)**

**Philadelphia, Pennsylvania, USA  
23-27 May 2022**

**Pages 1-896**



**IEEE Catalog Number: CFP22RAA-POD  
ISBN: 978-1-7281-9682-4**

**Copyright © 2022 by the Institute of Electrical and Electronics Engineers, Inc.  
All Rights Reserved**

*Copyright and Reprint Permissions:* Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***\*\*\* This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP22RAA-POD
ISBN (Print-On-Demand):	978-1-7281-9682-4
ISBN (Online):	978-1-7281-9681-7

**Additional Copies of This Publication Are Available From:**

Curran Associates, Inc  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: (845) 758-0400  
Fax: (845) 758-2633  
E-mail: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# TABLE OF CONTENTS

Can Your Drone Touch? Exploring the Boundaries of Consumer-Grade Multirotors for Physical Interaction.....	1
<i>Paul Lassen, Matteo Fumagalli</i>	
A Multi-VTOL Modular Aspect Ratio Reconfigurable Aerial Robot.....	8
<i>Stephen J. Carlson, Prateek Arora, Christos Papachristos</i>	
Elastic Tracker: A Spatio-Temporal Trajectory Planner for Flexible Aerial Tracking .....	47
<i>Jialin Ji, Neng Pan, Chao Xu, Fei Gao</i>	
Aerial Manipulation Using Contact with the Environment by Thrust Vectorable Multilinked Aerial Robot.....	54
<i>Nobuki Sugito, Moju Zhao, Tomoki Anzai, Takuzumi Nishio, Kei Okada, Masayuki Inaba</i>	
Evolved Neuromorphic Radar-Based Altitude Controller for an Autonomous Open-Source Blimp.....	85
<i>Marina González-Alvarez, Julien Dupeyroux, Federico Corradi, Guido C. H. E. De Croon</i>	
Prediction of Metacarpophalangeal Joint Angles and Classification of Hand Configurations Based on Ultrasound Imaging of the Forearm .....	91
<i>Keshav Bimbraw, Christopher J. Nycz, Matthew J. Schueler, Ziming Zhang, Haichong K. Zhang</i>	
SAGCI-System: Towards Sample-Efficient, Generalizable, Compositional, and Incremental Robot Learning .....	98
<i>Jun Lv, Qiaojun Yu, Lin Shao, Wenhai Liu, Wenqiang Xu, Cewu Lu</i>	
A Method for Designing Autonomous Robots that Know Their Limits .....	121
<i>Alvika Gautam, Tim Whiting, Xuan Cao, Michael A. Goodrich, Jacob W. Crandall</i>	
Task Persistification for Robots with Control-Dependent Energy Dynamics .....	128
<i>Carmen Jimenez Cortes, Magnus Egerstedt</i>	
Charting the Trade-Off Between Design Complexity and Plan Execution Under Probabilistic Actions .....	135
<i>Fatemeh Zahra Saberifar, Dylan A. Shell, Jason M. O’Kane</i>	
Towards Dynamic Visual Servoing for Interaction Control and Moving Targets.....	150
<i>Alexander Antonio Oliva, Erwin Aertbeliën, Joris De Schutter, Paolo Robuffo Giordano, François Chaumette</i>	
An Agile Bicycle-Like Robot for Complex Steel Structure Inspection.....	157
<i>Son Thanh Nguyen, Hai Nguyen, Son Tien Bui, Van Anh Ho, Trung Dung Ngo, Hung Manh La</i>	
CCRobot-V: A Silkworm-Like Cooperative Cable-Climbing Robotic System for Cable Inspection and Maintenance.....	164
<i>Zhenliang Zheng, Ning Ding, Huaping Chen, Xiaoli Hu, Zhihao Zhu, Xueqi Fu, Wenchao Zhang, Lin Zhang, Sarsenbek Hazken, Ziya Wang, Min Zhao</i>	
Learning to Navigate by Pushing .....	171
<i>Cornelia Bauer, Dominik Bauer, Alisa Allaire, Christopher G. Atkeson, Nancy Pollard</i>	

Online Optimal Landing Control of the MIT Mini Cheetah.....	178
<i>Se Hwan Jeon, Sangbae Kim, Donghyun Kim</i>	
Modeling, Validation, and Design Investigation of a Passive Biped Walker with Knees and Biomimetic Feet .....	193
<i>Aikaterini Smyrli, Evangelos Papadopoulos</i>	
A Mathematical Design for a Novel Walking Support Device that Leverages Passive Dynamics and Coupling Effects.....	200
<i>Longchuan Li, Shugen Ma, Isao Tokuda, Makoto Nokata, Yang Tian, Liang Du, Zhiqing Li</i>	
Scalable Minimally Actuated Leg Extension Bipedal Walker Based on 3D Passive Dynamics.....	207
<i>Sharfin Islam, Kamal Carter, Justin Yim, James Kyle, Sarah Bergbreiter, Aaron M. Johnson</i>	
Task-Oriented Generation of Stable Motions for Wheeled Inverted Pendulum Robots.....	214
<i>Marco Kannevorff, Tommaso Belvedere, Nicola Scianca, Filippo M. Smaldone, Leonardo Lanari, Giuseppe Oriolo</i>	
Whole-Body MPC and Dynamic Occlusion Avoidance: A Maximum Likelihood Visibility Approach .....	221
<i>Ibrahim Ibrahim, Farbod Farshidian, Jan Preisig, Perry Franklin, Paolo Rocco, Marco Hutter</i>	
Whole-Body Control of Series-Parallel Hybrid Robots .....	228
<i>Dennis Mronga, Shivesh Kumar, Frank Kirchner</i>	
Omni-Roach: A Legged Robot Capable of Traversing Multiple Types of Large Obstacles and Self-Righting .....	235
<i>Jonathan Mi, Yaqing Wang, Chen Li</i>	
Fast Collision Checking for Dual-Arm Collaborative Robots Working in Close Proximity.....	243
<i>Miaoying Zhou, Xinyu Zhang</i>	
DPMPC-Planner: A Real-Time UAV Trajectory Planning Framework for Complex Static Environments with Dynamic Obstacles.....	250
<i>Zhefan Xu, Di Deng, Yiping Dong, Kenji Shimada</i>	
Simultaneous Control and Trajectory Estimation for Collision Avoidance of Autonomous Robotic Spacecraft Systems.....	257
<i>Matthew King-Smith, Panagiotis Tsiotras, Frank Dellaert</i>	
Collision Avoidance for Multiple Quadrotors Using Elastic Safety Clearance Based Model Predictive Control.....	265
<i>Tao Jin, Xinghu Wang, Haibo Ji, Jian Di, Han Yan</i>	
Improving the Feasibility of DS-Based Collision Avoidance Using Non-Linear Model Predictive Control.....	272
<i>Saverio Farsoni, Alessio Sozzi, Marco Minelli, Cristian Secchi, Marcello Bonfè</i>	
Learning to Socially Navigate in Pedestrian-Rich Environments with Interaction Capacity .....	279
<i>Quecheng Qiu, Shunyi Yao, Jing Wang, Jun Ma, Guangda Chen, Jianmin Ji</i>	
Safety-Critical Control and Planning for Obstacle Avoidance Between Polytopes with Control Barrier Functions.....	286
<i>Akshay Thirugnanam, Jun Zeng, Koushil Sreenath</i>	

Nearest-Neighbor-Based Collision Avoidance for Quadrotors Via Reinforcement Learning.....	293
<i>Ramzi Ourari, Kai Cui, Ahmed Elshamhory, Heinz Koeppel</i>	
Fully Persistent Spatial Data Structures for Efficient Queries in Path-Dependent Motion Planning Applications.....	329
<i>Sathwik Karnik, Tomás Lozano-Pérez, Leslie Pack Kaelbling, Gustavo Nunes Goretkin</i>	
Iterative Mesh Modification Planning: A New Method for Automatic Disassembly Planning of Complex Industrial Components.....	336
<i>Robert Hegewald, Nicola Wolpert, Elmar Schömer</i>	
SPIN Road Mapper: Extracting Roads from Aerial Images Via Spatial and Interaction Space Graph Reasoning for Autonomous Driving.....	343
<i>Wele Gedara Chaminda Bandara, Jeya Maria Jose Valanarasu, Vishal M. Patel</i>	
Object Insertion Based Data Augmentation for Semantic Segmentation.....	359
<i>Yuan Ren, Siyan Zhao, Liu Bingbing</i>	
Depth Estimation Matters Most: Improving Per-Object Depth Estimation for Monocular 3D Detection and Tracking.....	366
<i>Longlong Jing, Ruichi Yu, Henrik Kretzschmar, Kang Li, Charles R. Qi, Hang Zhao, Alper Ayvaci, Xu Chen, Dillon Cower, Yingwei Li, Yurong You, Han Deng, Congcong Li, Dragomir Anguelov</i>	
Approximating the Polynomial System for Effective Relative Pose Estimation.....	374
<i>Deshun Hu</i>	
A Linear Comb Filter for Event Flicker Removal.....	398
<i>Ziwei Wang, Dingran Yuan, Yonhon Ng, Robert Mahony</i>	
Towards Robust Part-Aware Instance Segmentation for Industrial Bin Picking.....	405
<i>Yidan Feng, Biqi Yang, Xianzhi Li, Chi-Wing Fu, Rui Cao, Kai Chen, Qi Dou, Mingqiang Wei, Yun-Hui Liu, Pheng-Ann Heng</i>	
Learning Local Event-Based Descriptor for Patch-Based Stereo Matching.....	412
<i>Peigen Liu, Guang Chen, Zhijun Li, Huajin Tang, Alois Knoll</i>	
Stable 3D Human Pose Estimation in Low- Resolution Videos with a Few Views.....	427
<i>Chihiro Nakatsuka, Satoshi Komorita</i>	
Learning Multi-Task Transferable Rewards Via Variational Inverse Reinforcement Learning.....	434
<i>Se-Wook Yoo, Seung-Woo Seo</i>	
Learning from Imperfect Demonstrations Via Adversarial Confidence Transfer.....	441
<i>Zhangjie Cao, Zihan Wang, Dorsa Sadigh</i>	
OPIRL: Sample Efficient Off-Policy Inverse Reinforcement Learning Via Distribution Matching.....	448
<i>Hana Hoshino, Kei Ota, Asako Kanezaki, Rio Yokota</i>	
Cross Domain Robot Imitation with Invariant Representation.....	455
<i>Zhao-Heng Yin, Lingfeng Sun, Hengbo Ma, Masayoshi Tomizuka, Wu-Jun Li</i>	
Demonstration-Efficient Guided Policy Search Via Imitation of Robust Tube MPC.....	462
<i>Andrea Tagliabue, Dong-Ki Kim, Michael Everett, Jonathan P. How</i>	
Weakly Supervised Correspondence Learning.....	469
<i>Zihan Wang, Zhangjie Cao, Yilun Hao, Dorsa Sadigh</i>	

JST: Joint Self-Training for Unsupervised Domain Adaptation on 2D&3D Object Detection .....	477
<i>Guangyao Ding, Meiyang Zhang, E Li, Qi Hao</i>	
Learning Spatiotemporal Occupancy Grid Maps for Lifelong Navigation in Dynamic Scenes.....	484
<i>Hugues Thomas, Matthieu Gallet De Saint Aurin, Jian Zhang, Timothy D. Barfoot</i>	
Kinematic Structure Estimation of Arbitrary Articulated Rigid Objects for Event Cameras .....	508
<i>Urbano Miguel Nunes, Yiannis Demiris</i>	
Incremental Learning for Enhanced Personalization of Autocomplete Teleoperation .....	515
<i>Mohammad Haj Hussein, Batoool Ibrahim, Imad H. Elhaji, Daniel Asmar</i>	
Learning to Detect Slip with Barometric Tactile Sensors and a Temporal Convolutional Neural Network.....	570
<i>Abhinav Grover, Philippe Nadeau, Christopher Grebe, Jonathan Kelly</i>	
Meta-Path Analysis on Spatio-Temporal Graphs for Pedestrian Trajectory Prediction .....	617
<i>Aamir Hasan, Pranav Sriram, Katherine Driggs-Campbell</i>	
Interleaving Monte Carlo Tree Search and Self-Supervised Learning for Object Retrieval in Clutter .....	625
<i>Baichuan Huang, Teng Guo, Abdeslam Boularias, Jingjin Yu</i>	
RepAr-Net: Re-Parameterized Encoders and Attentive Feature Arsenals for Fast Video Denoising .....	633
<i>S P Sharan, Adithya K Krishna, A Siddharth Rao, Varun P Gopi</i>	
A User-Customized Automatic Music Composition System .....	640
<i>Fan Mo, Xiaoqiang Ji, Huihuan Qian, Yangsheng Xu</i>	
KEMP: Keyframe-Based Hierarchical End-To-End Deep Model for Long- Term Trajectory Prediction .....	646
<i>Qiuqing Lu, Weiqiao Han, Jeffrey Ling, Minfa Wang, Haoyu Chen, Balakrishnan Varadarajan, Paul Covington</i>	
Narrowing the Coordinate-Frame Gap in Behavior Prediction Models: Distillation for Efficient and Accurate Scene-Centric Motion Forecasting.....	653
<i>Dijia Andy Su, Bertrand Douillard, Rami Al-Rfou, Cheol Park, Benjamin Sapp</i>	
SEHLNet: Separate Estimation of High- And Low-Frequency Components for Depth Completion .....	668
<i>Qiang Liu, Haosong Yue, Zhanggang Lyu, Wei Wang, Zhong Liu, Weihai Chen</i>	
Visually Grounding Language Instruction for History-Dependent Manipulation .....	675
<i>Hyemin Ahn, Obin Kwon, Kyungdo Kim, Jaeyeon Jeong, Howoong Jun, Hongjung Lee, Dongheui Lee, Songhwai Oh</i>	
PF-MOT: Probability Fusion Based 3D Multi-Object Tracking for Autonomous Vehicles .....	700
<i>Tao Wen, Yanyong Zhang, Nikolaos M. Freris</i>	
Powerful and Dexterous Multi-Finger Hand Using Dynamical Pulley Mechanism.....	707
<i>Tadaaki Hasegawa, Hironori Waita, Tomohiro Kawakami, Yoshinari Takemura, Tetsuya Ishikawa, Yuta Kimura, Chiaki Tanaka, Kenichiro Sugiyama, Takahide Yoshiike</i>	
HGC-Net: Deep Anthropomorphic Hand Grasping in Clutter .....	714
<i>Yiming Li, Wei Wei, Daheng Li, Peng Wang, Wanyi Li, Jun Zhong</i>	
Learn to Grasp with Less Supervision: A Data-Efficient Maximum Likelihood Grasp Sampling Loss .....	721
<i>Xinghao Zhu, Yefan Zhou, Yongxiang Fan, Lingfeng Sun, Jianyu Chen, Masayoshi Tomizuka</i>	

Multi-Dimensional Compliance of Soft Grippers Enables Gentle Interaction with Thin, Flexible Objects.....	728
<i>Clark B. Teeple, Justin Werfel, Robert J. Wood</i>	
Grasp Transfer for Deformable Objects by Functional Map Correspondence .....	735
<i>Cristiana De Farias, Brahim Tamadazte, Rustam Stolkin, Naresh Marturi</i>	
Learning Object Relations with Graph Neural Networks for Target-Driven Grasping in Dense Clutter.....	742
<i>Xibai Lou, Yang Yang, Changhyun Choi</i>	
Learning to Pick by Digging: Data-Driven Dig-Grasping for Bin Picking from Clutter .....	749
<i>Chao Zhao, Zhekai Tong, Juan Rojas, Jungwon Seo</i>	
Automatic Acquisition of a Repertoire of Diverse Grasping Trajectories Through Behavior Shaping and Novelty Search .....	755
<i>Aurélien Morel, Yakumo Kunitomo, Alex Coninx, Stéphane Doncieux</i>	
FFHNet: Generating Multi-Fingered Robotic Grasps for Unknown Objects in Real-Time.....	762
<i>Vincent Mayer, Qian Feng, Jun Deng, Yunlei Shi, Zhaopeng Chen, Alois Knoll</i>	
A Force-Sensitive Grasping Controller Using Tactile Gripper Fingers and an Industrial Position-Controlled Robot.....	770
<i>Volker Gabler, Gerold Huber, Dirk Wollherr</i>	
Multi-Object Grasping - Types and Taxonomy.....	777
<i>Yu Sun, Eliza Amato, Tianze Chen</i>	
A Novel Convolutional Neural Network for Emotion Recognition Using Neurophysiological Signals.....	792
<i>Marc Tunnell, Huijin Chung, Yuchou Chang</i>	
AMI: Adaptive Motion Imitation Algorithm Based on Deep Reinforcement Learning.....	798
<i>Nazita Taghavi, Moath H. A. Alqatamin, Dan O. Popa</i>	
Grouptron: Dynamic Multi-Scale Graph Convolutional Networks for Group-Aware Dense Crowd Trajectory Forecasting.....	805
<i>Rui Zhou, Hongyu Zhou, Huidong Gao, Masayoshi Tomizuka, Jiachen Li, Zhuo Xu</i>	
Deep Learning-Driven Front-Following Within Close Proximity: A Hands-Free Control Model on a Smart Walker.....	812
<i>Zhao Chongyu, Guo Wenzhi, Wen Rongwei, Zheng Wang, Chuan Wu</i>	
A2DIO: Attention-Driven Deep Inertial Odometry for Pedestrian Localization Based on 6D IMU .....	819
<i>Yingying Wang, Hu Cheng, Max Q.-H. Meng</i>	
Adaptable Action-Aware Vital Models for Personalized Intelligent Patient Monitoring.....	826
<i>Kai Wu, Ee Heng Chen, Xing Hao, Felix Wirth, Keti Vitanova, Rüdiger Lange, Darius Burschka</i>	
Human-Following and -Guiding in Crowded Environments Using Semantic Deep-Reinforcement-Learning for Mobile Service Robots .....	833
<i>Linh Kästner, Bassel Fatloun, Zhengcheng Shen, Daniel Gawrisch, Jens Lambrecht</i>	
Robust Impedance Control for Dexterous Interaction Using Fractal Impedance Controller with IK-Optimisation .....	840
<i>Carlo Tiseo, Quentin Rouxel, Zhibin Li, Michael Mistry</i>	

Towards Efficient 3D Human Motion Prediction Using Deformable Transformer-Based Adversarial Network .....	861
<i>Yu Hua, Fan Xuanzhe, Hou Yaqing, Liu Yi, Kang Cai, Zhou Dongsheng, Zhang Qiang</i>	
RTGNN: A Novel Approach to Model Stochastic Traffic Dynamics .....	876
<i>Ke Sun, Stephen Chaves, Paul Martin, Vijay Kumar</i>	
RMS-FlowNet: Efficient and Robust Multi-Scale Scene Flow Estimation for Large-Scale Point Clouds.....	883
<i>Ramy Batraway, René Schuster, Mohammad–ali Nikouei Mahani, Didier Stricker</i>	
Real-Time Full-Stack Traffic Scene Perception for Autonomous Driving with Roadside Cameras.....	890
<i>Zhengxia Zou, Rusheng Zhang, Shengyin Shen, Gaurav Pandey, Punarjay Chakravarty, Armin Parchami, Henry X. Liu</i>	
SafetyNet: Safe Planning for Real-World Self-Driving Vehicles Using Machine-Learned Policies .....	897
<i>Matt Vitelli, Yan Chang, Yawei Ye, Ana Ferreira, Maciej Wolczyk, Blazej Osinski, Moritz Niendorf, Hugo Grimmer, Qiangui Huang, Ashesh Jain, Peter Ondruska</i>	
Camera-Tracklet-Aware Contrastive Learning for Unsupervised Vehicle Re-Identification.....	905
<i>Jongmin Yu, Junsik Kim, Minkyung Kim, Hyeontaek Oh</i>	
Decentralized Ride-Sharing of Shared Autonomous Vehicles Using Graph Neural Network-Based Reinforcement Learning.....	912
<i>Boqi Li, Nejb Ammar, Prashant Tiwari, Hwei Peng</i>	
Extrinsic Calibration and Verification of Multiple Non-Overlapping Field of View Lidar Sensors.....	919
<i>Sandipan Das, Navid Mahabadi, Addi Djikic, Cesar Nassir, Saikat Chatterjee, Maurice Fallon</i>	
LB-L2L-Calib: Accurate and Robust Extrinsic Calibration for Multiple 3D LiDARs with Long Baseline and Large Viewpoint Difference .....	926
<i>Jun Zhang, Qiyang Lyu, Guohao Peng, Zhenyu Wu, Qiao Yan, Danwei Wang</i>	
Fusing Event-Based and RGB Camera for Robust Object Detection in Adverse Conditions.....	933
<i>Abhishek Tomy, Anshul Paigwar, Khushdeep S. Mann, Alessandro Renzaglia, Christian Laugier</i>	
Pedestrian Stop and Go Forecasting with Hybrid Feature Fusion.....	940
<i>Dongxu Guo, Taylor Mordan, Alexandre Alahi</i>	
Online Prediction of Lane Change with a Hierarchical Learning-Based Approach.....	948
<i>Xishun Liao, Ziran Wang, Xuanpeng Zhao, Zhouqiao Zhao, Kyungtae Han, Prashant Tiwari, Matthew J. Barth, Guoyuan Wu</i>	
Gripper Positioning for Object Deformation Tasks.....	963
<i>Ignacio Cuiral-Zueco, Gonzalo López-Nicolás, Helder Araujo</i>	
Non-Prehensile Planar Manipulation Via Trajectory Optimization with Complementarity Constraints.....	970
<i>João Moura, Theodoros Stouraitis, Sethu Vijayakumar</i>	
Coordinate Invariant User-Guided Constrained Path Planning with Reactive Rapidly Expanding Plane-Oriented Escaping Trees .....	977
<i>Riddhiman Laha, Ruiqi Sun, Wenxi Wu, Dasharadhan Mahalingam, Nilanjan Chakraborty, Luis F. C. Figueredo, Sami Haddadin</i>	



PyROBOCOP: Python-Based Robotic Control & Optimization Package for Manipulation.....	985
<i>Arvind U. Raghunathan, Devesh K. Jha, Diego Romeres</i>	
Robust Pivoting: Exploiting Frictional Stability Using Bilevel Optimization.....	992
<i>Yuki Shirai, Devesh K. Jha, Arvind U. Raghunathan, Diego Romeres</i>	
TOPP-MPC-Based Dual-Arm Dynamic Collaborative Manipulation for Multi-Object Nonprehensile Transportation .....	999
<i>Cheng Zhou, Maolin Lei, Longfei Zhao, Zunran Wang, Yu Zheng</i>	
Coordination of Two Robotic Manipulators for Object Retrieval in Clutter.....	1039
<i>Jeeho Ahn, Changhwan Kim, Changjoo Nam</i>	
Planning and Control for Cable-Routing with Dual-Arm Robot.....	1046
<i>Gabriel Arslan Waltersson, Rita Laezza, Yiannis Karayiannidis</i>	
DRAGONFLY: A UAV Rapidly Deployed Micro-Profilers Array for Underwater Thermocline Observation .....	1053
<i>Chenxin Lyu, Zhihao Fan, Yuanbo Bi, Zheng Zeng, Lian Lian</i>	
Using Monocular Vision and Human Body Priors for AUVs to Autonomously Approach Divers .....	1076
<i>Michael Fulton, Jungseok Hong, Junaed Sattar</i>	
Design of an Autonomous Latching System for Surface Vessels .....	1099
<i>David Fernández-Gutiérrez, Niklas Hagemann, Wei Wang, Rens Doornbusch, Joshua Jordan, Jonathan Schiphorst, Pietro Leoni, Fabio Duarte, Carlo Ratti, Daniela Rus</i>	
Towards Accurate Positioning of Underwater Vehicles Using Low-Cost Acoustic Modems .....	1106
<i>Christian Busse, Bernd-Christian Renner</i>	
High Definition, Inexpensive, Underwater Mapping .....	1113
<i>Bharat Joshi, Marios Xanthidis, Sharmin Rahman, Ioannis Rekleitis</i>	
Reconfigurable Underactuated Adaptive Gripper Designed by Morphological Computation * .....	1130
<i>Ivan I. Borisov, Evgenii E. Khomutov, Dmitriy V. Ivolga, Nikita A. Molchanov, Ivan A. Maksimov, Sergey A. Kolyubin</i>	
Design and Optimization of a Magnetic Catcher for UAV Landing on Disturbed Aquatic Surface Platforms .....	1162
<i>Chongfeng Liu, Zixing Jiang, Ruoyu Xu, Xiaoqiang Ji, Lianxin Zhang, Huihuan Qian</i>	
Design and Modeling of a Spherical Robot Actuated by a Cylindrical Drive.....	1169
<i>Bruno Belzile, David St-Onge</i>	
Design and Modeling of a Compact Advancement Mechanism for a Modified COAST Guidewire Robot.....	1176
<i>Patrick Lis, Achraj Sarma, Grace Trimpe, Timothy A. Brumfiel, Ronghuai Qi, Jaydev P. Desai</i>	
A Novel Passive Mechanism for Flying Robots to Perch onto Surfaces.....	1183
<i>Haotse Hsiao, Feiyu Wu, Jiefeng Sun, Jianguo Zhao</i>	
A Lightweight, High-Extension, Planar 3-Degree-Of-Freedom Manipulator Using Pinched Bistable Tapes .....	1190
<i>O. Godson Osele, Allison M. Okamura, Brian H. Do</i>	

SiamX: An Efficient Long-Term Tracker Using Cross-Level Feature Correlation and Adaptive Tracking Scheme .....	1237
<i>Huajian Huang, Sai-Kit Yeung</i>	
Accurate Calibration of Multi-Perspective Cameras from a Generalization of the Hand-Eye Constraint .....	1244
<i>Yifu Wang, Wenqing Jiang, Kun Huang, Sören Schwertfeger, Laurent Kneip</i>	
Few-Shot Keypoint Detection as Task Adaptation Via Latent Embeddings.....	1251
<i>Mel Vecerik, Jackie Kay, Raia Hadsell, Lourdes Agapito, Jon Scholz</i>	
Keypoint-Based Category-Level Object Pose Tracking from an RGB Sequence with Uncertainty Estimation.....	1258
<i>Yunzhi Lin, Jonathan Tremblay, Stephen Tyree, Patricio A. Vela, Stan Birchfield</i>	
MotionHint: Self-Supervised Monocular Visual Odometry with Motion Constraints.....	1265
<i>Cong Wang, Yu-Ping Wang, Dinesh Manocha</i>	
Fast Graph Refinement and Implicit Neural Representation for Tissue Tracking.....	1281
<i>Adam Schmidt, Omid Mohareri, Simon Dimaio, Septimiu E. Salcudean</i>	
PoseSDF: Simultaneous 3D Human Shape Reconstruction and Gait Pose Estimation Using Signed Distance Functions .....	1297
<i>Jianxin Yang, Yuxuan Liu, Xiao Gu, Guang-Zhong Yang, Yao Guo</i>	
Learning Friction Model for Magnet-Actuated Tethered Capsule Robot.....	1323
<i>Yi Wang, Yuyang Tu, Yuchen He, Xutian Deng, Ziwei Lei, Jianwei Zhang, Miao Li</i>	
$L_1$ Adaptive Augmentation for Geometric Tracking Control of Quadrotors.....	1329
<i>Zhuohuan Wu, Sheng Cheng, Kasey A. Ackerman, Aditya Gahlawat, Arun Lakshmanan, Pan Zhao, Naira Hovakimyan</i>	
Shape Control of Deformable Linear Objects with Offline and Online Learning of Local Linear Deformation Models.....	1337
<i>Mingrui Yu, Hanzhong Zhong, Xiang Li</i>	
KoopNet: Joint Learning of Koopman Bilinear Models and Function Dictionaries with Application to Quadrotor Trajectory Tracking.....	1344
<i>Carl Folkestad, Skylar X. Wei, Joel W. Burdick</i>	
Tracking Fast Trajectories with a Deformable Object Using a Learned Model .....	1351
<i>James A. Preiss, David Millard, Tao Yao, Gaurav S. Sukhatme</i>	
Model Identification and Control of a Low-Cost Mobile Robot with Omnidirectional Wheels Using Differentiable Physics .....	1358
<i>Edgar Granados, Abdeslam Boularias, Kostas Bekris, Mridul Aanjaneya</i>	
Combined Fast Control of Drifting State and Trajectory Tracking for Autonomous Vehicles Based on MPC Controller .....	1373
<i>Cheng Hu, Xiaoling Zhou, Ran Duo, Haokun Xiong, Yu Qi, Zhiming Zhang, Lei Xie</i>	
Composable Causality in Semantic Robot Programming.....	1380
<i>Emily Sheetz, Xiaotong Chen, Zhen Zeng, Kaizhi Zheng, Qiuyu Shi, Odest Chadwicke Jenkins</i>	
A Hierarchical Control Framework for Drift Maneuvering of Autonomous Vehicles.....	1387
<i>Bo Yang, Yiwen Lu, Xu Yang, Yilin Mo</i>	

Value Learning from Trajectory Optimization and Sobolev Descent: A Step Toward Reinforcement Learning with Superlinear Convergence Properties .....	1410
<i>Amit Parag, Sébastien Kleff, Léo Saci, Nicolas Mansard, Olivier Stasse</i>	
A Hybrid Model-Based Evolutionary Optimization with Passive Boundaries for Physical Human-Robot Interaction.....	1426
<i>Gustavo J. G. Lahr, Henrique B. Garcia, Arash Ajoudani, Thiago Boaventura, Glauco A. P. Caurin</i>	
Impact Planning and Pre-Configuration Based on Hierarchical Quadratic Programming .....	1433
<i>Francesco Tassi, Soheil Gholami, Simone Giudice, Arash Ajoudani</i>	
Optimal-Horizon Model Predictive Control with Differential Dynamic Programming .....	1440
<i>Kyle Stachowicz, Evangelos A. Theodorou</i>	
Implicit Differential Dynamic Programming .....	1455
<i>Wilson Jallet, Nicolas Mansard, Justin Carpentier</i>	
Trajectory Distribution Control for Model Predictive Path Integral Control Using Covariance Steering.....	1478
<i>Ji Yin, Zhiyuan Zhang, Evangelos Theodorou, Panagiotis Tsiotras</i>	
Multirobot Control with Double-Integrator Dynamics and Control Barrier Functions for Deformable Object Transport.....	1485
<i>Rafael Herguedas, Miguel Aranda, Gonzalo López-Nicolás, Carlos Sagüés, Youcef Mezouar</i>	
Context-Aware Grasp Generation in Cluttered Scenes .....	1492
<i>Dinh-Cuong Hoang, Johannes A. Stork, Todor Stoyanov</i>	
“The World is Its Own Best Model”: Robust Real-World Manipulation Through Online Behavior Selection .....	1499
<i>Manuel Baum, Oliver Brock</i>	
The Second Generation (G2) Fingertip Sensor for Near-Distance Ranging and Material Sensing in Robotic Grasping*.....	1506
<i>Cheng Fang, Di Wang, Dezhen Song, Jun Zou</i>	
Push-To-See: Learning Non-Prehensile Manipulation to Enhance Instance Segmentation Via Deep Q-Learning .....	1513
<i>Baris Serhan, Harit Pandya, Ayse Kucukyilmaz, Gerhard Neumann</i>	
Non-Penetration Iterative Closest Points for Single-View Multi-Object 6D Pose Estimation.....	1520
<i>Mengchao Zhang, Kris Hauser</i>	
Learning-Based Ellipse Detection for Robotic Grasps of Cylinders and Ellipsoids.....	1527
<i>Huixu Dong, Jiadong Zhou, Chen Qiu, Prasad K. Dilip, I-Ming Chen</i>	
TransGrasp: A Multi-Scale Hierarchical Point Transformer for 7-DoF Grasp Detection.....	1533
<i>Zhixuan Liu, Zibo Chen, Shangjin Xie, Wei-Shi Zheng</i>	
Online Object Model Reconstruction and Reuse for Lifelong Improvement of Robot Manipulation.....	1540
<i>Shiyang Lu, Rui Wang, Yinglong Miao, Chaitanya Mitash, Kostas Bekris</i>	
Single-Stage Keypoint-Based Category-Level Object Pose Estimation from an RGB Image .....	1547
<i>Yunzhi Lin, Jonathan Tremblay, Stephen Tyree, Patricio A. Vela, Stan Birchfield</i>	

Multi-View Object Pose Distribution Tracking for Pre-Grasp Planning on Mobile Robots .....	1554
<i>Lakshadeep Naik, Thorbjørn Mosekjær Iversen, Aljaz Kramberger, Jakob Wilm, Norbert Krüger</i>	
Efficient and Robust Training of Dense Object Nets for Multi-Object Robot Manipulation.....	1562
<i>David B. Adrian, Andras Gabor Kupcsik, Markus Spies, Heiko Neumann</i>	
Deep Surrogate Q-Learning for Autonomous Driving.....	1578
<i>Maria Kalweit, Gabriel Kalweit, Moritz Werling, Joschka Boedecker</i>	
Legged Robots that Keep on Learning: Fine-Tuning Locomotion Policies in the Real World.....	1593
<i>Laura Smith, J. Chase Kew, Xue Bin Peng, Sehoon Ha, Jie Tan, Sergey Levine</i>	
Accessibility-Based Clustering for Efficient Learning of Locomotion Skills .....	1600
<i>Chong Zhang, Wanming Yu, Zhibin Li</i>	
Dynamic Mirror Descent Based Model Predictive Control for Accelerating Robot Learning.....	1631
<i>Utkarsh A. Mishra, Soumya R. Samineni, Prakhar Goel, Chandravarun Kunjeti, Himanshu Lodha, Aman Singh, Aditya Sagi, Shalabh Bhatnagar, Shishir Kolathaya</i>	
Unified Data Collection for Visual-Inertial Calibration Via Deep Reinforcement Learning.....	1646
<i>Yunke Ao, Le Chen, Florian Tschopp, Michel Breyer, Roland Siegwart, Andrei Cramariuc</i>	
Relative Distributed Formation and Obstacle Avoidance with Multi-Agent Reinforcement Learning.....	1661
<i>Yuzi Yan, Xiaoxiang Li, Xinyou Qiu, Jiantao Qiu, Jian Wang, Yu Wang, Yuan Shen</i>	
Estimation of Upper Limb Kinematics with a Magnetometer-Free Egocentric Visual-Inertial System* .....	1668
<i>Tong Li, Xiaoyu Wu, Huixu Dong, Haoyong Yu</i>	
Joint State and Input Estimation of Agent Based on Recursive Kalman Filter Given Prior Knowledge.....	1675
<i>Zida Wu, Zhaoliang Zheng, Ankur Mehta</i>	
Towards Artefact Aware Human Motion Capture Using Inertial Sensors Integrated into Loose Clothing.....	1682
<i>Michael Lorenz, Gabriele Bleser, Takayuki Akiyama, Takehiro Niikura, Didier Stricker, Bertram Taetz</i>	
Improved Kalman-Particle Kernel Filter on Lie Groups Applied to Angles-Only UAV Navigation.....	1689
<i>Clément Chahbazian, Karim Dahia, Nicolas Merlinge, Bénédicte Winter-Bonnet, Kévin Honore, Christian Musso</i>	
Asynchronous Collaborative Localization by Integrating Spatiotemporal Graph Learning with Model-Based Estimation .....	1695
<i>Peng Gao, Brian Reily, Rui Guo, Hongsheng Lu, Qingzhao Zhu, Hao Zhang</i>	
Symbolic State Estimation with Predicates for Contact-Rich Manipulation Tasks.....	1702
<i>Toki Migimatsu, Wenzhao Lian, Jeannette Bohg, Stefan Schaal</i>	
Development of a Stereo-Vision Based High-Throughput Robotic System for Mouse Tail Vein Injection.....	1777
<i>Tianyi Ko, Koichi Nishiwaki, Koji Terada, Yusuke Tanaka, Shun Mitsumata, Ryuichi Katagiri, Junko Taketo, Naoshi Horiba, Hideyoshi Igata, I Kazue Mizuno</i>	
Dual-Scale Robotic Solution for Middle Ear Surgery .....	1784
<i>Jae-Hun So, Brahim Tamadazte, Naresh Marturi, Jérôme Szewczyk</i>	

Using Language to Generate State Abstractions for Long-Range Planning in Outdoor Environments.....	1888
<i>Matthew Berg, George Konidaris, Stefanie Tellex</i>	
Reactive Locomotion Decision-Making and Robust Motion Planning for Real-Time Perturbation Recovery.....	1896
<i>Zhaoyuan Gu, Nathan Boyd, Ye Zhao</i>	
Locomotion as a Risk-Mitigating Behavior in Uncertain Environments: A Rapid Planning and Few-Shot Failure Adaptation Approach.....	1911
<i>Jacob Hackett, Dylan Epstein-Gross, Monica Daley, Christian Hubicki</i>	
Persistent Homology for Effective Non-Prehensile Manipulation .....	1918
<i>Ewerton R. Vieira, Daniel Nakhimovich, Kai Gao, Rui Wang, Jingjin Yu, Kostas E. Bekris</i>	
Visually Grounded Task and Motion Planning for Mobile Manipulation.....	1925
<i>Xiaohan Zhang, Yifeng Zhu, Yan Ding, Yuke Zhu, Peter Stone, Shiqi Zhang</i>	
Long-Horizon Manipulation of Unknown Objects Via Task and Motion Planning with Estimated Affordances .....	1940
<i>Aidan Curtis, Xiaolin Fang, Leslie Pack Kaelbling, Tomás Lozano-Pérez, Caelan Reed Garrett</i>	
Failure is an Option: Task and Motion Planning with Failing Executions .....	1947
<i>Tianyang Pan, Andrew M. Wells, Rahul Shome, Lydia E. Kavraki</i>	
Hierarchical Policy Learning for Mechanical Search.....	1954
<i>Oussama Zenkri, Ngo Anh Vien, Gerhard Neumann</i>	
Fast High-Quality Tabletop Rearrangement in Bounded Workspace .....	1961
<i>Kai Gao, Darren Lau, Baichuan Huang, Kostas E. Bekris, Jingjin Yu</i>	
Efficient and High-Quality Prehensile Rearrangement in Cluttered and Confined Spaces .....	1968
<i>Rui Wang, Yinglong Miao, Kostas E. Bekris</i>	
Optimal Design and Control of an Aerial Manipulator with Elastic Suspension Using Unidirectional Thrusters.....	1976
<i>Miguel Arpa Perozo, Jean Dussine, Arda Yigit, Loïc Cuvillon, Sylvain Durand, Jacques Gangloff</i>	
Large-Angle and High-Speed Trajectory Tracking Control of a Quadrotor UAV Based on Reachability.....	1983
<i>Zhou Liu, Lilong Cai</i>	
Cooperative Modular Single Actuator Monocopters Capable of Controlled Passive Separation.....	1989
<i>Xinyu Cai, Shane Kyi Hla Win, Luke Soe Thura Win, Danial Suftyan, Shaohui Foong</i>	
Optimal Thrust Vector Control of an Electric Small-Scale Rocket Prototype .....	1996
<i>Raphaël Linsen, Petr Listov, Albéric De Lajarte, Roland Schwan, Colin N. Jones</i>	
Optimal Inverted Landing in a Small Aerial Robot with Varied Approach Velocities and Landing Gear Designs .....	2003
<i>Bryan Habas, Bader Alattar, Brian Davis, Jack W. Langelaan, Bo Cheng</i>	
SMORS: A Soft Multirotor UAV for Multimodal Locomotion and Robust Interaction.....	2010
<i>Markus Ryll, Robert K. Katzschmann</i>	

Centroidal Aerodynamic Modeling and Control of Flying Multibody Robots.....	2017
<i>Tong Hui, Antonello Paolino, Gabriele Nava, Giuseppe L'Erario, Fabio Di Natale, Fabio Bergonti, Francesco Braghin, Daniele Pucci</i>	
Cooperative Transportation Using Multiple Single-Rotor Robots and Decentralized Control for Unknown Payloads.....	2024
<i>Koshi Oishi, Yasushi Amano, Tomohiko Jimbo</i>	
PogoDrone: Design, Model, and Control of a Jumping Quadrotor .....	2031
<i>Brian Zhu, Jiawei Xu, Andrew Charway, David Saldaña</i>	
Energy Tank-Based Policies for Robust Aerial Physical Interaction with Moving Objects.....	2054
<i>Maximilian Brunner, Livio Giacomini, Roland Siegwart, Marco Tognon</i>	
Generalized Omega Turn Gait Enables Agile Limbless Robot Turning in Complex Environments .....	2061
<i>Tianyu Wang, Baxi Chong, Yuelin Deng, Ruijie Fu, Howie Choset, Daniel I. Goldman</i>	
SenSnake: A Snake Robot with Contact Force Sensing for Studying Locomotion in Complex 3-D Terrain .....	2068
<i>Divya Ramesh, Qiyuan Fu, Chen Li</i>	
Autonomous Actuation of Flapping Wing Robots Inspired by Asynchronous Insect Muscle .....	2076
<i>James Lynch, Jeff Gau, Simon Sponberg, Nick Gravish</i>	
Liftoff of a Motor-Driven Flapping Wing Rotorcraft with Mechanically Decoupled Wings.....	2092
<i>Fangyuan Liu, Song Li, Ziyu Wang, Xin Dong, Daochun Li, Zhan Tu</i>	
A New Bio-Inspired Hybrid Cable-Driven Robot (HCDR) to Design More Realistic Snakebots .....	2134
<i>E. Gautreau, J. Sandoval, X. Bonnet, M. Arsicault, S. Zegloul, M. A. Laribi</i>	
Single User WiFi Structure from Motion in the Wild .....	2157
<i>Yiming Qian, Hang Yan, Sachini Herath, Pyojin Kim, Yasutaka Furukawa</i>	
PatchGraph: In-Hand Tactile Tracking with Learned Surface Normals.....	2164
<i>Paloma Sodhi, Michael Kaess, Mustafa Mukadanr, Stuart Anderson</i>	
LTSR: Long-Term Semantic Relocalization Based on HD Map for Autonomous Vehicles .....	2171
<i>Huayou Wang, Changliang Xue, Yu Tang, Wanlong Li, Feng Wen, Hongbo Zhang</i>	
DEVO: Depth-Event Camera Visual Odometry in Challenging Conditions.....	2179
<i>Yi-Fan Zuo, Jiaqi Yang, Jiaben Chen, Xia Wang, Yifu Wang, Laurent Kneip</i>	
Fast-MbyM: Leveraging Translational Invariance of the Fourier Transform for Efficient and Accurate Radar Odometry.....	2186
<i>Rob Weston, Matthew Gadd, Daniele De Martini, Paul Newman, Ingmar Posner</i>	
DA-LMR: A Robust Lane Marking Representation for Data Association.....	2193
<i>Miguel Ángel Muñoz-Bañón, Jan-Hendrik Pauls, Haohao Hu, Christoph Stiller</i>	
Neural Implicit Event Generator for Motion Tracking.....	2200
<i>Mana Masuda, Yusuke Sekikawa, Ryo Fujii, Hideo Saito</i>	
Translation Invariant Global Estimation of Heading Angle Using Sinogram of LiDAR Point Cloud.....	2207
<i>Xiaqing Ding, Xuecheng Xu, Sha Lu, Yanmei Jiao, Mengwen Tan, Rong Xiong, Huanjun Deng, Mingyang Li, Yue Wang</i>	

LoGG3D-Net: Locally Guided Global Descriptor Learning for 3D Place Recognition.....	2215
<i>Kavisha Vidanapathirana, Milad Ramezani, Peyman Moghadam, Sridha Sridharan, Clinton Fookes</i>	
AutoPlace: Robust Place Recognition with Single-Chip Automotive Radar .....	2222
<i>Kaiwen Cait, Bing Wang, Chris Xiaoxuan Lu</i>	
GCLO: Ground Constrained LiDAR Odometry with Low-Drifts for GPS-Denied Indoor Environments.....	2229
<i>Xin Wei, Jixin Lv, Jie Sun, Erbao Dong, Shiliang Pu</i>	
ROW-SLAM: Under-Canopy Cornfield Semantic SLAM.....	2244
<i>Jiacheng Yuan, Jungseok Hong, Junaed Sattar, Volkan Isler</i>	
Loop Closure Detection and SLAM in Vineyards with Deep Semantic Cues .....	2251
<i>Alexios Papadimitriou, Ioannis Kleitsiotis, Ioannis Kostavelis, Ioannis Mariolis, Dimitrios Giakoumis, Spiriden Likothanassis, Dimitrios Tzovaras</i>	
Precise 3D Reconstruction of Plants from UAV Imagery Combining Bundle Adjustment and Template Matching.....	2259
<i>Elias Marks, Federico Magistri, Cyrill Stachniss</i>	
Self-Supervised Representation Learning for Reliable Robotic Monitoring of Fruit Anomalies.....	2266
<i>Taeyeong Choi, Owen Would, Adrian Salazar-Gomez, Grzegorz Cielniak</i>	
Deep-CNN Based Robotic Multi-Class Under-Canopy Weed Control in Precision Farming.....	2273
<i>Yayun Du, Guofeng Zhang, Darren Tsang, Mohammad Khalid Jawed</i>	
Precision Fruit Tree Pruning Using a Learned Hybrid Vision/interaction Controller .....	2280
<i>Alexander You, Hannah Kolano, Nidhi Parayil, Cindy Grimm, Joseph R. Davidson</i>	
Strawberry Picking Point Localization Ripeness and Weight Estimation .....	2295
<i>Alessandra Tafuro, Adeayo Adewumi, Soran Parsa, Ghalamzan E. Amir, Bappaditya Debnath</i>	
Non-Destructive Fruit Firmness Evaluation Using Vision-Based Tactile Information.....	2303
<i>Yaohui Chen, Jiahao Lin, Xuan Du, Bin Fang, Fuchun Sun, Shanjun Li</i>	
Deep Reinforcement Learning for Next-Best-View Planning in Agricultural Applications .....	2323
<i>Xiangyu Zeng, Tobias Zaenker, Maren Bennewitz</i>	
Mapping Unknown Environments with Instrumented Honey Bees .....	2330
<i>Haron Abdel-Raziq, Daniel Palmer, Alyosha Molnar, Kirstin Petersen</i>	
Crossmodal Transformer Based Generative Framework for Pedestrian Trajectory Prediction.....	2337
<i>Zhaoxin Su, Gang Huang, Sanyuan Zhang, Wei Hua</i>	
Lightweight Monocular Depth Estimation Through Guided Decoding .....	2344
<i>Michael Rudolph, Youssef Dawoud, Ronja Gldenring, Lazaros Nalpantidis, Vasileios Belagiannis</i>	
Propagating State Uncertainty Through Trajectory Forecasting .....	2351
<i>Boris Ivanovic, Yifeng Lin, Shubham Shrivastava, Punarjay Chakravarty, Marco Pavone</i>	
De-Snowing LiDAR Point Clouds with Intensity and Spatial-Temporal Features .....	2359
<i>Boyang Li, Jieling Li, Gang Chen, Hejun Wu, Kai Huang</i>	

Refactoring ISP for High-Level Vision Tasks.....	2366
<i>Yongjie Shi, Songjiang Li, Xu Jia, Jianzhuang Liu</i>	
N-QGN: Navigation Map from a Monocular Camera Using Quadtree Generating Networks.....	2381
<i>Daniel Braun, Olivier Morell, Pascal Vasseur, Cédric Demonceaux</i>	
Depth-SIMS: Semi-Parametric Image and Depth Synthesis .....	2388
<i>Valentina Musat, Daniele De Martini, Matthew Gadd, Paul Newman</i>	
HoloSeg: An Efficient Holographic Segmentation Network for Real-Time Scene Parsing.....	2395
<i>Shu Li, Qingqing Yan, Chengju Liu, Ming Liu, Qijun Chen</i>	
Lifting 2D Object Locations to 3D by Discounting LiDAR Outliers Across Objects and Views.....	2411
<i>Robert McCraith, Eldar Insafutdinov, Lukas Neumann, Andrea Vedaldi</i>	
VISTA 2.0: An Open, Data-Driven Simulator for Multimodal Sensing and Policy Learning for Autonomous Vehicles .....	2419
<i>Alexander Amini, Tsun-Hsuan Wang, Igor Gilitschenski, Wilko Schwarting, Zhijian Liu, Song Han, Sertac Karaman, Daniela Rus</i>	
Memory-Based Gaze Prediction in Deep Imitation Learning for Robot Manipulation.....	2427
<i>Heecheol Kim, Yoshiyuki Ohmura, Yasuo Kuniyoshi</i>	
Towards More Generalizable One-Shot Visual Imitation Learning.....	2434
<i>Zhao Mandi, Fangchen Liu, Kimin Lee, Pieter Abbeel</i>	
Symphony: Learning Realistic and Diverse Agents for Autonomous Driving Simulation .....	2445
<i>Maximilian Igl, Daewoo Kim, Alex Kuefler, Paul Mouglin, Punit Shah, Kyriacos Shiarlis, Dragomir Anguelov, Mark Palatucci, Brandyn White, Shimon Whiteson</i>	
Adversarial Imitation Learning from Video Using a State Observer .....	2452
<i>Haresh Karnan, Faraz Torabi, Garrett Warnell, Peter Stone</i>	
Modular Adaptive Policy Selection for Multi-Task Imitation Learning Through Task Division .....	2459
<i>Dafni Antotsiou, Carlo Ciliberto, Tae-Kyun Kim</i>	
Disturbance-Injected Robust Imitation Learning with Task Achievement.....	2466
<i>Hirotaaka Tahara, Hikaru Sasaki, Hanbit Oh, Brendan Michael, Takamitsu Matsubara</i>	
Skeletal Feature Compensation for Imitation Learning with Embodiment Mismatch .....	2482
<i>Eddy Hudson, Garrett Warnell, Faraz Torabi, Peter Stone</i>	
Multi-Task Learning with Sequence-Conditioned Transporter Networks.....	2489
<i>Michael H. Lim, Andy Zeng, Brian Ichter, Maryam Bandari, Erwin Coumans, Claire Tomlin, Stefan Schaal, Aleksandra Faust</i>	
VOILA: Visual-Observation-Only Imitation Learning for Autonomous Navigation .....	2497
<i>Haresh Karnan, Garrett Warnell, Xuesu Xiao, Peter Stone</i>	
Generalizable Task Representation Learning from Human Demonstration Videos: A Geometric Approach .....	2504
<i>Jun Jin, Martin Jagersand</i>	
Look and Listen: A Multi-Sensory Pouring Network and Dataset for Granular Media from Human Demonstrations.....	2519
<i>Alexis Burns, Siyuan Xiang, Daewon Lee, Larry Jackel, Shuran Song, Volkan Isler</i>	



Predicting Like a Pilot: Dataset and Method to Predict Socially-Aware Aircraft Trajectories in Non-Towered Terminal Airspace .....	2525
<i>Jay Patrikar, Brady Moon, Jean Oh, Sebastian Scherer</i>	
ORFD: A Dataset and Benchmark for Off-Road Freespace Detection .....	2532
<i>Chen Min, Weizhong Jiang, Dawei Zhao, Jiaolong Xu, Liang Xiao, Yiming Nie, Bin Dai</i>	
IPS300+: A Challenging Multi-Modal Data Sets for Intersection Perception System .....	2539
<i>Huanan Wang, Xinyu Zhang, Zhiwei Li, Jun Li, Kun Wang, Zhu Lei, Ren Haibing</i>	
TartanDrive: A Large-Scale Dataset for Learning Off-Road Dynamics Models .....	2546
<i>Samuel Triest, Matthew Sivaprakasam, Sean J. Wang, Wenshan Wang, Aaron M. Johnson, Sebastian Scherer</i>	
Google Scanned Objects: A High-Quality Dataset of 3D Scanned Household Items .....	2553
<i>Laura Downs, Anthony Francis, Nate Koenig, Brandon Kinman, Ryan Hickman, Krista Reymann, Thomas B. McHugh, Vincent Vanhoucke</i>	
Cityscapes TL++: Semantic Traffic Light Annotations for the Cityscapes Dataset .....	2569
<i>Johannes Janosovits</i>	
How to Build a Curb Dataset with LiDAR Data for Autonomous Driving .....	2576
<i>Dongfeng Bai, Tongtong Cao, Jingming Guo, Bingbing Liu</i>	
OPV2V: An Open Benchmark Dataset and Fusion Pipeline for Perception with Vehicle-To-Vehicle Communication .....	2583
<i>Runsheng Xu, Hao Xiang, Xin Xia, Xu Han, Jinlong Li, Jiaqi Ma</i>	
RF-Annotate: Automatic RF-Supervised Image Annotation of Common Objects in Context .....	2590
<i>Emerson Sie, Deepak Vasisht</i>	
Multi-Modal Motion Prediction with Transformer-Based Neural Network for Autonomous Driving .....	2605
<i>Zhiyu Huang, Xiaoyu Mo, Chen Lv</i>	
HiTPR: Hierarchical Transformer for Place Recognition in Point Cloud .....	2612
<i>Zhixing Hou, Yan Yan, Chengzhong Xu, Hui Kong</i>	
Diff-Net: Image Feature Difference Based High-Definition Map Change Detection for Autonomous Driving .....	2635
<i>Lei He, Shengjie Jiang, Xiaoqing Liang, Ning Wang, Shiyu Song</i>	
Context is Everything: Implicit Identification for Dynamics Adaptation .....	2642
<i>Ben Evans, Abitha Thankaraj, Lerrel Pinto</i>	
Unsupervised Domain Adaptation in LiDAR Semantic Segmentation with Self-Supervision and Gated Adapters .....	2649
<i>Mrigank Rochan, Shubhra Aich, Eduardo R. Corral-Soto, Amir Nabatchian, Bingbing Liu</i>	
Implicit Kinematic Policies: Unifying Joint and Cartesian Action Spaces in End-To-End Robot Learning .....	2656
<i>Aditya Ganapathi, Pete Florence, Jake Varley, Kaylee Burns, Ken Goldberg, Andy Zeng</i>	
SEMI: Self-Supervised Exploration Via Multisensory Incongruity .....	2663
<i>Jianren Wang, Ziwen Zhuang, Hang Zhao</i>	

Real-Robot Deep Reinforcement Learning: Improving Trajectory Tracking of Flexible-Joint Manipulator with Reference Correction .....	2671
<i>Dmytro Pavlichenko, Sven Behnke</i>	
Sequential Joint Shape and Pose Estimation of Vehicles with Application to Automatic Amodal Segmentation Labeling.....	2678
<i>Josephine Monica, Wei-Lun Chao, Mark Campbell</i>	
A Dual-Stream Architecture for Real-Time Morphological Analysis of Aneurysm in Robot-Assisted Minimally Invasive Surgery.....	2686
<i>Yan-Jie Zhou, Shi-Qi Liu, Xiao-Liang Xie, Xiao-Hu Zhou, Zeng-Guang Hou, Rui-Qi Li, Zhen-Liang Ni, Chen-Chen Fan</i>	
Manipulation of Unknown Objects Via Contact Configuration Regulation.....	2693
<i>Neel Doshi, Orion Taylor, Alberto Rodriguez</i>	
Physical Property Estimation and Knife Trajectory Optimization During Robotic Cutting.....	2700
<i>Xiaoqian Mu, Yan-Bin Jia</i>	
RMPs for Safe Impedance Control in Contact-Rich Manipulation .....	2707
<i>Seiji Shaw, Ben Abbatematteo, George Konidakis</i>	
Discovering Synergies for Robot Manipulation with Multi-Task Reinforcement Learning .....	2714
<i>Zhanpeng He, Matei Ciocarlie</i>	
Contact Mode Guided Motion Planning for Quasidynamic Dexterous Manipulation in 3D.....	2730
<i>Xianyi Cheng, Eric Huang, Yifan Hou, Matthew T. Mason</i>	
Learning Purely Tactile In-Hand Manipulation with a Torque-Controlled Hand .....	2745
<i>Leon Sievers, Johannes Pitz, Berthold Bäuml</i>	
On the Feasibility of Learning Finger-Gaiting In-Hand Manipulation with Intrinsic Sensing.....	2752
<i>Gagan Khandate, Maximilian Haas-Heger, Matei Ciocarlie</i>	
Negative Stiffness Analysis and Regulation of In-Hand Manipulation with Underactuated Compliant Hands.....	2759
<i>Wenrui Chen, Qiang Diao, Yaonan Wang, Xiaodong Zhou, Qiang Zhang, Cuo Yan, Zhiyong Li</i>	
Robust and Accurate Multi-Agent SLAM with Efficient Communication for Smart Mobiles .....	2782
<i>Jialing Liu, Kaiqi Chen, Ruyu Liu, Yanhong Yang, Zhenhua Wang, Jianhua Zhang</i>	
Synergistic Scheduling of Learning and Allocation of Tasks in Human-Robot Teams .....	2789
<i>Shivam Vats, Oliver Kroemer, Maxim Likhachev</i>	
Mixed Reality as Communication Medium for Human-Robot Collaboration.....	2796
<i>Simone Macciò, Alessandro Carfi, Fulvio Mastrogiovanni</i>	
Adaptive Vision-Based Control of Redundant Robots with Null-Space Interaction for Human-Robot Collaboration .....	2803
<i>Xiangjie Yan, Chen Chen, Xiang Li</i>	
HATP/EHDA: A Robot Task Planner Anticipating and Eliciting Human Decisions and Actions .....	2818
<i>Guilhem Buisan, Anthony Favier, Amandine Mayima, Rachid Alami</i>	

Dynamic Human-Robot Role Allocation Based on Human Ergonomics Risk Prediction and Robot Actions Adaptation.....	2825
<i>Elena Merlo, Edoardo Lamon, Fabio Fusaro, Marta Lorenzini, Alessandro Carfi, Fulvio Mastrogiovanni, Arash Ajoudani</i>	
Assisting Operators of Articulated Machinery with Optimal Planning and Goal Inference.....	2832
<i>Ehsan Yousefi, Dylan P. Losey, Inna Sharf</i>	
R2poweR: The Proof-Of-Concept of a Backdrivable, High-Ratio Gearbox for Human-Robot Collaboration* .....	2846
<i>P. L. Garcia, S. Crispel, A. Varadharajan, E. Saerens, T. Verstraten, B. Vanderborght, D. Lefeber</i>	
All-In-One: A DRL-Based Control Switch Combining State-Of-The-Art Navigation Planners .....	2861
<i>Linh Kastner, Johannes Cox, Teham Buiyan, Jens Lambrecht</i>	
Trajectory Prediction with Linguistic Representations .....	2868
<i>Yen-Ling Kuo, Xin Huang, Andrei Barbu, Stephen G. McGill, Boris Katz, John J. Leonard, Guy Rosman</i>	
Game-Theoretic Planning for Autonomous Driving Among Risk-Aware Human Drivers.....	2876
<i>Rohan Chandra, Mingyu Wang, Mac Schwager, Dinesh Manocha</i>	
Deploying Traffic Smoothing Cruise Controllers Learned from Trajectory Data.....	2884
<i>Nathan Lichtlé, Eugene Vinitsky, Matthew Nice, Benjamin Seibold, Dan Work, Alexandre M. Bayen</i>	
Personalized Car Following for Autonomous Driving with Inverse Reinforcement Learning .....	2891
<i>Zhouqiao Zhao, Ziran Wang, Kyungtae Han, Rohit Gupta, Prashant Tiwari, Guoyuan Wu, Matthew J. Barth</i>	
HYPeR: Learned Hybrid Trajectory Prediction Via Factored Inference and Adaptive Sampling.....	2906
<i>Xin Huang, Guy Rosman, Igor Gilitschenski, Ashkan Jasour, Stephen G. McGill, John J. Leonard, Brian C. Williams</i>	
Important Object Identification with Semi-Supervised Learning for Autonomous Driving .....	2913
<i>Jiachen Li, Haiming Gang, Hengbo Ma, Masayoshi Tomizuka, Chiho Choi</i>	
BAANet: Learning Bi-Directional Adaptive Attention Gates for Multispectral Pedestrian Detection .....	2920
<i>Xiaoxiao Yang, Yeqiang Qian, Huijie Zhu, Chunxiang Wang, Ming Yang</i>	
Globally Optimal Relative Pose Estimation for Multi-Camera Systems with Known Gravity Direction.....	2935
<i>Qianliang Wu, Yaqing Ding, Xinlei Qi, Jin Xie, Jian Yang</i>	
Robotic Manipulators Performing Smart Sanding Operation: A Vibration Approach.....	2958
<i>Joshua Nguyen, Manuel Bailey, Ignacio Carlucho, Corina Barbalata</i>	
Learning to Fill the Seam by Vision: Sub-Millimeter Peg-In-Hole on Unseen Shapes in Real World .....	2982
<i>Liang Xie, Hongxiang Yu, Yinghao Zhao, Haodong Zhang, Zhongxiang Zhou, Minhang Wang, Yue Wang, Rong Xiong</i>	
An Experimental Study of Wind Resistance and Power Consumption in MAVs with a Low-Speed Multi-Fan Wind System .....	2989
<i>Diana A. Olejnik, Sunyi Wang, Julien Dupeyroux, Stein Stroobants, Matej Karasek, Christophe De Wagter, Guido De Croon</i>	

Amplitude Control for Parallel Lattices of Docked Modboats.....	3027
<i>Gedaliah Knizhnik, Mark Yim</i>	
Sliding Mode Controller for Positioning of an Underwater Vehicle Subject to Disturbances and Time Delays .....	3034
<i>Harun Tugal, Kamil Cetin, Xiaoran Han, Ibrahim Kucukdemiral, Joshua Roe, Yvan Petillot, M. Suphi Erden</i>	
HoloOcean: An Underwater Robotics Simulator .....	3040
<i>Easton Potokar, Spencer Ashford, Michael Kaess, Joshua G. Mangelson</i>	
Flow-Based Control of Marine Robots in Gyre-Like Environments.....	3047
<i>Gedaliah Knizhnik, Peihan Li, Xi Yu, M. Ani Hsieh</i>	
Spatial Acoustic Projection for 3D Imaging Sonar Reconstruction .....	3054
<i>Sascha Arnold, Bilal Wehbe</i>	
An Integrated Design Pipeline for Tactile Sensing Robotic Manipulators.....	3136
<i>Lara Zlokapa, Yiyue Luo, Jie Xu, Michael Foshey, Kui Wu, Pulkit Agrawal, Wojciech Matusik</i>	
Graph Grammar-Based Automatic Design for Heterogeneous Fleets of Underwater Robots.....	3143
<i>Allan Zhao, Jie Xu, Juan Salazar, Wei Wang, Pingchuan Ma, Daniela Rus, Wojciech Matusik</i>	
The Design of Stretch: A Compact, Lightweight Mobile Manipulator for Indoor Human Environments.....	3150
<i>Charles C. Kemp, Aaron Edsinger, Henry M. Clever, Blaine Matulevich</i>	
Orientation to Pose: Continuum Robots Shape Reconstruction Based on the Multi-Attitude Solving Approach .....	3203
<i>Hao Cheng, Hejie Xu, Hongji Shang, Xueqian Wang, Houde Liu, Bin Liang</i>	
A Novel Full State Feedback Decoupling Controller for Elastic Robot Arm.....	3210
<i>Hongxi Zhu, Ulrike Thomas</i>	
3D Printing of Concrete with a Continuum Robot Hose Using Variable Curvature Kinematics .....	3216
<i>Manu Srivastava, Jake Ammons, Abdul B. Peerzada, Venkat N. Krovi, Prasad Rangaraju, Ian D. Walker</i>	
Modeling the Dynamics of Soft Robots by Discs and Threads .....	3223
<i>Joshua A. Schultz, Haley Sanders, Phuc Duc Hong Bui, Brett Layer, Marc Killpack</i>	
A Recurrent Differentiable Engine for Modeling Tensegrity Robots Trainable with Low-Frequency Data .....	3230
<i>Kun Wang, Mridul Aanjaneya, Kostas Bekris</i>	
Forward Kinematics and Control of a Segmented Tunable-Stiffness 3-D Continuum Manipulator .....	3238
<i>Shivangi Misra, Cynthia Sung</i>	
Online Assistance Control of a Pneumatic Gait Assistive Suit Using Physical Reservoir Computing Exploiting Air Dynamics.....	3245
<i>Hiroyuki Hayashi, Toshihiro Kawase, Tetsuro Miyazaki, Maina Sogabe, Yoshikazu Nakajima, Kenji Kawashima</i>	
Modeling of Viscoelastic Dielectric Elastomer Actuators Based on the Sparse Identification Method .....	3252
<i>Jisen Li, Hao Wang, Jian Zhu</i>	

Adaptive Dynamic Sliding Mode Control of Soft Continuum Manipulators .....	3259
<i>Amirhossein Kazempour, Oliver Fischer, Yasunori Tshimitsu, Ki Wan Wong, Robert K. Katzschmann</i>	
Regulations Aware Motion Planning for Autonomous Surface Vessels in Urban Canals .....	3291
<i>Jitske De Vries, Elia Trevisan, Jules Van Der Toorn, Tuhin Das, Bruno Brito, Javier Alonso-Mora</i>	
Autonomous Teamed Exploration of Subterranean Environments Using Legged and Aerial Robots .....	3306
<i>Mihir Kulkarni, Mihir Dharmadhikari, Marco Tranzatto, Samuel Zimmermann, Victor Reijgwart, Paolo De Petris, Huan Nguyen, Nikhil Khedekar, Christos Papachristos, Lionel Ott, Roland Siegwart, Marco Hutter, Kostas Alexis</i>	
ST-RRT*: Asymptotically-Optimal Bidirectional Motion Planning Through Space-Time .....	3314
<i>Francesco Grothe, Valentin N. Hartmann, Andreas Orthey, Marc Toussaint</i>	
Speed Planning in Dynamic Environments Over a Fixed Path for Autonomous Vehicles .....	3321
<i>Wenda Xu, John M. Dolan</i>	
Coverage Path Planning in Large-Scale Multi-Floor Urban Environments with Applications to Autonomous Road Sweeping .....	3328
<i>Daniel Engelsons, Mattias Tiger, Fredrik Heintz</i>	
Convex Strategies for Trajectory Optimisation: Application to the Polytope Traversal Problem.....	3335
<i>Steve Tonneau</i>	
Oriented Surface Reachability Maps for Robot Placement .....	3357
<i>Timo Birr, Christoph Pohl, Tamim Asfour</i>	
COP: Control & Observability-Aware Planning .....	3364
<i>Christoph Böhm, Pascal Brault, Quentin Delamare, Paolo Robuffo Giordano, Stephan Weiss</i>	
AMRA*: Anytime Multi-Resolution Multi-Heuristic A* .....	3371
<i>Dhruv Mauria Saxena, Tushar Kusnur, Maxim Likhachev</i>	
Real-Time Multi-Contact Model Predictive Control Via ADMM .....	3414
<i>Alp Aydinoglu, Michael Posa</i>	
Maximum Entropy Differential Dynamic Programming.....	3422
<i>Oswin So, Ziyi Wang, Evangelos A. Theodorou</i>	
Optimal Control Via Combined Inference and Numerical Optimization .....	3429
<i>Daniel Layeghi, Steve Tonneau, Michael Mistry</i>	
Autonomous Racing with Multiple Vehicles Using a Parallelized Optimization with Safety Guarantee Using Control Barrier Functions .....	3444
<i>Suiyi He, Jun Zeng, Koushil Sreenath</i>	
Pose Estimation Based on a Dual Quaternion Feedback Particle Filter .....	3460
<i>Wenjie Li, Wasif Naeem, Wenhao Ji, Jia Liu, Wei Hao, Lijun Chen</i>	
Robust Control Under Uncertainty Via Bounded Rationality and Differential Privacy.....	3467
<i>Vincent Pacelli, Anirudha Majumdar</i>	
Uncertainty-Based Exploring Strategy in Densely Cluttered Scenes for Vacuum Cup Grasping .....	3483
<i>Kimwa Tung, Jingcheng Su, Junhao Cai, Zhaoliang Wan, Hui Cheng</i>	

Grounding Predicates Through Actions .....	3498
<i>Toki Migimatsu, Jeannette Bohg</i>	
Detection of Slip from Vision and Touch.....	3537
<i>Gang Yan, Alexander Schmitz, Tito Pradhono Tomo, Sophon Somlor, Satoshi Funabashi, Shigeki Sugano</i>	
Learning to Navigate Intersections with Unsupervised Driver Trait Inference .....	3576
<i>Shuijing Liu, Peixin Chang, Haonan Chen, Neeloy Chakraborty, Katherine Driggs-Campbell</i>	
VIRDO: Visio-Tactile Implicit Representations of Deformable Objects .....	3583
<i>Youngsun Wi, Pete Florence, Andy Zeng, Nima Fazeli</i>	
Seeking Visual Discomfort: Curiosity-Driven Representations for Reinforcement Learning.....	3591
<i>Elie Aljalbout, Maximilian Ulmer, Rudolph Triebel</i>	
Topologically-Informed Atlas Learning.....	3598
<i>Thomas Cohn, Nikhil Devraj, Odest Chadwicke Jenkins</i>	
Intrinsically Motivated Self-Supervised Learning in Reinforcement Learning.....	3605
<i>Yue Zhao, Chenzhuang Du, Hang Zhao, Tiejun Li</i>	
Offline Learning of Counterfactual Predictions for Real-World Robotic Reinforcement Learning.....	3616
<i>Jun Jin, Daniel Graves, Cameron Haigh, Jun Luo, Martin Jagersand</i>	
Generalizing to New Domains by Mapping Natural Language to Lifted LTL.....	3624
<i>Eric Hsiung, Hiloni Mehta, Junchi Chu, Xinyu Liu, Roma Patel, Stefanie Tellex, George Konidaris</i>	
Exploiting Abstract Symmetries in Reinforcement Learning for Complex Environments .....	3631
<i>Kashish Gupta, Homayoun Najjaran</i>	
Probabilistic Inference of Simulation Parameters Via Parallel Differentiable Simulation .....	3638
<i>Eric Heiden, Christopher E. Denniston, David Millard, Fabio Ramos, Gaurav S. Sukhatme</i>	
Sampling Over Riemannian Manifolds Using Kernel Herding .....	3646
<i>Sandesh Adhikary, Byron Boots</i>	
Collaborative Robot Mapping Using Spectral Graph Analysis.....	3662
<i>Lukas Bernreiter, Shehryar Khattak, Lionel Ott, Roland Siegwart, Marco Hutter, Cesar Cadena</i>	
Ensemble Kalman Filter Based LiDAR Odometry for Skewed Point Clouds Using Scan Slicing .....	3677
<i>Yeongkwon Choe, Jae Hyung Jung, Chan Gook Park</i>	
Next-Best-View Prediction for Active Stereo Cameras and Highly Reflective Objects .....	3684
<i>Jun Yang, Steven L. Waslander</i>	
Learning to Listen and Move: An Implementation of Audio-Aware Mobile Robot Navigation in Complex Indoor Environment .....	3699
<i>Pratyaksh P. Rao, Abhra Roy Chowdhury</i>	
Ada-Detector: Adaptive Frontier Detector for Rapid Exploration .....	3706
<i>Zezhou Sun, Banghe Wu, Chengzhong Xu, Hui Kong</i>	
CATs: Task Planning for Shared Control of Assistive Robots with Variable Autonomy .....	3775
<i>Samuel Bustamante, Gabriel Quere, Daniel Leidner, Jörn Vogel, Freerk Stulp</i>	

Robotically-Aligned Optical Coherence Tomography with Gaze Tracking for Live Image Montaging of the Retina .....	3783
<i>Pablo Ortiz, Mark Draelos, Amit Narawane, Ryan P. McNabb, Anthony N. Kuo, Joseph A. Izatt</i>	
Generalized 3D Rigid Point Set Registration with Anisotropic Positional Error Based on Bayesian Coherent Point Drift .....	3790
<i>Ang Zhang, Zhe Min, Xing Yang, Zhengyan Zhang, Jin Pan, Max Q.-H. Meng</i>	
Runtime Detection of Executional Errors in Robot-Assisted Surgery .....	3850
<i>Zongyu Li, Kay Hutchinson, Homa Alemzadeh</i>	
Large-Scale Network Traffic Prediction with LSTM and Temporal Convolutional Networks.....	3865
<i>Jing Bi, Haitao Yuan, Kangyuan Xu, Haisen Ma, Mengchu Zhou</i>	
Online State-Time Trajectory Planning Using Timed-ESDF in Highly Dynamic Environments.....	3949
<i>Delong Zhu, Tong Zhou, Jiahui Lin, Yuqi Fang, Max Q.-H. Meng</i>	
Towards Time-Optimal Tunnel-Following for Quadrotors.....	4044
<i>Jon Arrizabalaga, Markus Ryll</i>	
Bang-Bang Control with Constant Thrust of a Spherical Blimp Propelled by Ultrasound Beam .....	4051
<i>Takuro Furumoto, Masahiro Fujiwara, Yasutoshi Makino, Hiroyuki Shinoda</i>	
CineMPC: Controlling Camera Intrinsic and Extrinsic for Autonomous Cinematography .....	4058
<i>Pablo Pueyo, Eduardo Montijano, Ana C. Murillo, Mac Schwager</i>	
GTGraffiti: Spray Painting Graffiti Art from Human Painting Motions with a Cable Driven Parallel Robot .....	4065
<i>Gerry Chen, Sereym Baek, Juan-Diego Florez, Wanli Qian, Sang-Won Leigh, Seth Hutchinson, Frank Dellaert</i>	
Neural Style Transfer with Twin-Delayed DDPG for Shared Control of Robotic Manipulators.....	4073
<i>Raul Fernandez-Fernandez, Marco Aggravi, Paolo Robuffo Giordano, Juan G. Victores, Claudio Pacchierotti</i>	
A Detumbling Strategy for an Orbital Manipulator in the Post-Grasp Phase.....	4080
<i>Ria Vijayan, Marco De Stefano, Christian Ott</i>	
Autonomy and Perception for Space Mining .....	4087
<i>Ragav Sachdeva, Ravi Hammond, James Bockman, Alec Arthur, Brandon Smart, Dustin Craggs, Anh-Dzung Doan, Thomas Rowntree, Elijah Schutz, Adrian Orenstein, Andy Yu, Tat-Jun Chin, Ian Reid</i>	
AstroLoc: An Efficient and Robust Localizer for a Free-Flying Robot .....	4106
<i>Ryan Soussan, Varsha Kumar, Brian Coltin, Trey Smith</i>	
Robust Semantic Mapping and Localization on a Free-Flying Robot in Microgravity.....	4121
<i>Ian D. Miller, Ryan Soussan, Brian Coltin, Trey Smith, Vijay Kumar</i>	
DC-Loc: Accurate Automotive Radar Based Metric Localization with Explicit Doppler Compensation.....	4128
<i>Pengen Gao, Shengkai Zhang, Wei Wang, Chris Xiaoxuan Lu</i>	
SemLoc: Accurate and Robust Visual Localization with Semantic and Structural Constraints from Prior Maps .....	4135
<i>Shiwen Liang, Yunzhou Zhang, Rui Tian, Delong Zhu, Linghao Yang, Zhenzhong Cao</i>	

FP-Loc: Lightweight and Drift-Free Floor Plan-Assisted LiDAR Localization .....	4142
<i>Ling Gao, Laurent Kneip</i>	
LLOL: Low-Latency Odometry for Spinning Lidars .....	4149
<i>Chao Qu, Shreyas S. Shivakumar, Wenxin Liu, Camillo J. Taylor</i>	
PixSelect: Less but Reliable Pixels for Accurate and Efficient Localization .....	4156
<i>Mohammad Altilawi</i>	
Robust Monocular Localization in Sparse HD Maps Leveraging Multi-Task Uncertainty Estimation .....	4163
<i>Kürsat Petek, Kshitij Sirohi, Daniel Büscher, Wolfram Burgard</i>	
TrussBot: Modeling, Design, and Control of a Compliant, Helical Truss of Tetrahedral Modules .....	4218
<i>Yuhong Qin, Linda Ting, Celestina Saven, Yumika Amemiya, Michael Tanis, Randall D. Kamien, Cynthia Sung</i>	
Self-Reconfiguring Robotic Gantries Powered by Modular Magnetic Lead Screws .....	4225
<i>John Romanishin, James M. Bern, Daniela Rus</i>	
Energy Sharing Mechanism for a Freeform Robotic System - FreeBOT .....	4232
<i>Guanqi Liang, Yuxiao Tu, Lijun Zong, Junfeng Chen, Tin Lun Lam</i>	
FreeSN: A Freeform Strut-Node Structured Modular Self-Reconfigurable Robot - Design and Implementation.....	4239
<i>Yuxiao Tu, Guanqi Liang, Tin Lun Lam</i>	
ElectroVoxel: Electromagnetically Actuated Pivoting for Scalable Modular Self-Reconfigurable Robots.....	4254
<i>Martin Nisser, Leon Cheng, Yashaswini Makaram, Ryo Suzuki, Stefanie Mueller</i>	
SnailBot: A Continuously Dockable Modular Self-Reconfigurable Robot Using Rocker-Bogie Suspension.....	4261
<i>Da Zhao, Tin Lun Lam</i>	
Configuration Control for Physical Coupling of Heterogeneous Robot Swarms .....	4268
<i>Sha Yi, Zeynep Temel, Katia Sycara</i>	
Modular Robot Design Optimization with Generative Adversarial Networks .....	4282
<i>Jiaheng Hu, Julian Whitman, Matthew Travers, Howie Choset</i>	
Temporal Logic Guided Motion Primitives for Complex Manipulation Tasks with User Preferences.....	4305
<i>Hao Wang, Haoyuan He, Weiwei Shang, Zhen Kan</i>	
SaRA: A Tool for Safe Human-Robot Coexistence and Collaboration Through Reachability Analysis.....	4312
<i>Sven R. Schepp, Jakob Thumm, Stefan B. Liu, Matthias Althoff</i>	
Computing Funnels Using Numerical Optimization Based Falsifiers.....	4318
<i>Jiri Fejlek, Stefan Ratschan</i>	
Equivariant Filter Design for Inertial Navigation Systems with Input Measurement Biases .....	4333
<i>Alessandro Fornasier, Yonhon Ng, Robert Mahony, Stephan Weiss</i>	
Let's Collaborate: Regret-Based Reactive Synthesis for Robotic Manipulation .....	4340
<i>Karan Muvvala, Peter Amorese, Morteza Lahijanian</i>	



Planning Via Model Checking with Decision-Tree Controllers.....	4347
<i>Jonis Kiesbye, Kush Grover, Pranav Ashok, Jan Kretínský</i>	
Automated Task Updates of Temporal Logic Specifications for Heterogeneous Robots .....	4363
<i>Amy Fang, Hadas Kress-Gazit</i>	
On Nondeterminism in Combinatorial Filters .....	4378
<i>Yulin Zhang, Dylan A. Shell</i>	
Stronger Generalization Guarantees for Robot Learning by Combining Generative Models and Real-World Data.....	4414
<i>Abhinav Agarwal, Sushant Veer, Allen Z. Ren, Anirudha Majumdar</i>	
Speeding Up Deep Neural Network-Based Planning of Local Car Maneuvers Via Efficient B-Spline Path Construction .....	4422
<i>Piotr Kicki, Piotr Skrzypczyński</i>	
Learning-Guided Exploration for Efficient Sampling-Based Motion Planning in High Dimensions .....	4429
<i>Liam Schramm, Abdeslam Boularias</i>	
Control-Aware Prediction Objectives for Autonomous Driving .....	4436
<i>Rowan McAllister, Blake Wulfe, Jean Mercat, Logan Ellis, Sergey Levine, Adrien Gaidon</i>	
Hybrid Imitative Planning with Geometric and Predictive Costs in Off-Road Environments .....	4452
<i>Nitish Dashora, Daniel Shin, Dhruv Shah, Henry Leopold, David Fan, Ali Agha-Mohammadi, Nicholas Rhinehart, Sergey Levine</i>	
ReDUCE: Reformulation of Mixed Integer Programs Using Data from Unsupervised Clusters for Learning Efficient Strategies .....	4459
<i>Xuan Lin, Gabriel I. Fernandez, Dennis W. Hong</i>	
Where to Look Next: Learning Viewpoint Recommendations for Informative Trajectory Planning .....	4466
<i>Max Lodel, Bruno Brito, Álvaro Serra-Gómez, Laura Ferranti, Robert Babuška, Javier Alonso-Mora</i>	
Adaptive Informative Path Planning Using Deep Reinforcement Learning for UAV-Based Active Sensing .....	4473
<i>Julius Rücker, Liren Jin, Marija Popovic</i>	
Robotic Autonomous Trolley Collection with Progressive Perception and Nonlinear Model Predictive Control.....	4480
<i>Anxing Xiao, Hao Luan, Ziqi Zhao, Yue Hong, Jieting Zhao, Weinan Chen, Jiankun Wang, Max Q.-H. Meng</i>	
Learning to Rock-And-Walk: Dynamic, Non-Prehensile, and Underactuated Object Locomotion Through Reinforcement Learning .....	4487
<i>Abdullah Nazir, Xu Pu, Juan Rojas, Jungwon Seo</i>	
Modular End-Effector System for Autonomous Robotic Maintenance & Repair .....	4510
<i>Juncheng Li, Clark Teeple, Robert J. Wood, David J. Cappelleri</i>	
ReachBot: A Small Robot with Exceptional Reach for Rough Terrain .....	4517
<i>Tony G. Chen, Becky Miller, Crystal Winston, Stephanie Schneider, Andrew Bylard, Marco Pavone, Mark R. Cutkosky</i>	
Traffic Context Aware Data Augmentation for Rare Object Detection in Autonomous Driving .....	4548
<i>Naifan Li, Fan Song, Ying Zhang, Pengpeng Liang, Erkang Cheng</i>	

Self-Supervised Transparent Liquid Segmentation for Robotic Pouring .....	4555
<i>Gautham Narasimhan, Kai Zhang, Ben Eisner, Xingyu Lin, David Held</i>	
Semi-Supervised Learning with Mutual Distillation for Monocular Depth Estimation .....	4562
<i>Jongbeom Baek, Gyeongnyeon Kim, Seungryong Kim</i>	
OpenSceneVLAD: Appearance Invariant, Open Set Scene Classification .....	4578
<i>William H. B. Smith, Michael Milford, Klaus D. McDonald-Maier, Shoaib Ehsan, R. B. Fisher</i>	
Multi-Agent Variational Occlusion Inference Using People as Sensors .....	4585
<i>Masha Itkina, Ye-Ji Mun, Katherine Driggs-Campbell, Mykel J. Kochenderfer</i>	
Semantic-Aware Texture-Structure Feature Collaboration for Underwater Image Enhancement .....	4592
<i>Di Wang, Long Ma, Risheng Liu, Xin Fan</i>	
Conditioned Human Trajectory Prediction Using Iterative Attention Blocks .....	4599
<i>Aleksey Postnikov, Aleksander Gamayunov, Gonzalo Ferrer</i>	
Underwater Dock Detection Through Convolutional Neural Networks Trained with Artificial Image Generation .....	4621
<i>Jalil Chavez-Galaviz, Nina Mahmoudian</i>	
HDMaPNet: An Online HD Map Construction and Evaluation Framework.....	4628
<i>Qi Li, Yue Wang, Yilun Wang, Hang Zhao</i>	
Mini Cheetah, the Falling Cat: A Case Study in Machine Learning and Trajectory Optimization for Robot Acrobatics.....	4635
<i>Vince Kurtz, He Li, Patrick M. Wensing, Hai Lin</i>	
Unsupervised Learning of Terrain Representations for Haptic Monte Carlo Localization .....	4642
<i>Mikolaj Lysakowski, Michal R. Nowicki, Russell Buchanan, Marco Camurri, Maurice Fallon, Krzysztof Walas</i>	
Learning Efficient and Robust Multi-Modal Quadruped Locomotion: A Hierarchical Approach.....	4649
<i>Shaohang Xu, Lijun Zhu, Chin Pang Ho</i>	
A Linearization of Centroidal Dynamics for the Model-Predictive Control of Quadruped Robots .....	4656
<i>Wanchao Chi, Xinyang Jiang, Yu Zheng</i>	
Systematic Development of a Novel, Dynamic, Reduced Complexity Quadruped Robot Platform for Robotic Tail Research.....	4664
<i>Yujiong Liu, Pinhas Ben-Tzvi</i>	
An Adaptable Approach to Learn Realistic Legged Locomotion Without Examples.....	4671
<i>Daniel Ordonez-Appraez, Antonio Agudo, Francesc Moreno-Noguer, Mario Martin</i>	
Foothold Evaluation Criterion for Dynamic Transition Feasibility for Quadruped Robots .....	4679
<i>Luca Clemente, Octavio Villarreal, Angelo Bratta, Michele Focchi, Victor Barasuol, Giovanni Gerardo Muscolo, Claudio Semini</i>	
A Collision-Free MPC for Whole-Body Dynamic Locomotion and Manipulation.....	4686
<i>Jia-Ruei Chiu, Jean-Pierre Sleiman, Mayank Mittal, Farbod Farshidian, Marco Hutter</i>	
QuadRunner: A Transformable Quasi-Wheel Quadruped.....	4694
<i>Alper Yeldan, Abhimanyu Arora, Gim Song Soh</i>	

Monte Carlo Tree Search Gait Planner for Non-Gaited Legged System Control.....	4701
<i>Loranzo Amatucci, Joon-Ha Kim, Jemin Hwangbo, Hae-Won Park</i>	
Vision-Aided Dynamic Quadrupedal Locomotion on Discrete Terrain Using Motion Libraries .....	4708
<i>Ayush Agrawal, Shuxiao Chen, Akshara Rai, Koushil Sreenath</i>	
Proactive and Smooth Maneuvering for Navigation Around Pedestrians .....	4723
<i>Maria Kabtoul, Anne Spalanzani, Philippe Martinet</i>	
Learning Crowd-Aware Robot Navigation from Challenging Environments Via Distributed Deep Reinforcement Learning .....	4730
<i>Sango Matsuzaki, Yuji Hasegawa</i>	
An MPC Framework for Planning Safe & Trustworthy Robot Motions .....	4737
<i>Moritz Eckhoff, Robin Jeanne Kirschner, Elena Kern, Saeed Abdolshah, Sami Haddadin</i>	
Preemptive Motion Planning for Human-To-Robot Indirect Placement Handovers .....	4743
<i>Andrew Choi, Mohammad Khalid Jawed, Jungseock Joo</i>	
Enhanced Spatial Attention Graph for Motion Planning in Crowded, Partially Observable Environments.....	4750
<i>Weixian Shi, Yanying Zhou, Xiangyu Zeng, Shijie Li, Maren Bennewitz</i>	
Balancing Efficiency and Comfort in Robot-Assisted Bite Transfer .....	4757
<i>Suneel Belkhale, Ethan K. Gordon, Yuxiao Chen, Siddhartha Srinivasa, Tapomayukh Bhattacharjee, Dorsa Sadigh</i>	
KHAOS: A Kinematic Human Aware Optimization-Based System for Reactive Planning of Flying-Coworker .....	4764
<i>Jérôme Truc, Phani-Teja Singamaneni, Daniel Sidobre, Serena Ivaldi, Rachid Alami</i>	
Joint Communication and Motion Planning for Cobots .....	4771
<i>Mehdi Dadvar, Keyvan Majd, Elena Oikonomou, Georgios Fainekos, Siddharth Srivastava</i>	
A Physics-Informed, Vision-Based Method to Reconstruct All Deformation Modes in Slender Bodies.....	4810
<i>Seung Hyun Kim, Heng-Sheng Chang, Chia-Hsien Shih, Naveen Kumar Uppalapati, Udit Halder, Girish Krishnan, Prashant G. Mehta, Mattia Gazzola</i>	
Leveraging Distributed Contact Force Measurements for Slip Detection: A Physics-Based Approach Enabled by a Data-Driven Tactile Sensor .....	4826
<i>Pietro Griffa, Carmelo Sferrazza, Raffaello D'Andrea</i>	
Learning to Synthesize Volumetric Meshes from Vision-Based Tactile Imprints .....	4833
<i>Xinghao Zhu, Siddarth Jain, Masayoshi Tomizuka, Jeroen Van Baar</i>	
Computation of Dynamic Joint Reaction Forces of PKM and Its Use for Load-Minimizing Trajectory Planning .....	4848
<i>D. Gnad, H. Gattringer, A. Müller, W. Höbarth, R. Riepl, L. Messner</i>	
Toward Physical Human-Robot Interaction Control with Aerial Manipulators: Compliance, Redundancy Resolution, and Input Limits .....	4855
<i>Amr Afifi, Mark Van Holland, Antonio Franchi</i>	
Dynamic Modeling and Digital Twin of a Harmonic Drive Based Collaborative Robot Joint .....	4862
<i>Xingyu Yang, Dong Qiang, Zixuan Chen, Hao Wang, Zhengxue Zhou, Xuping Zhang</i>	

Formation-Containment Tracking and Scaling for Multiple Quadcopters with an Application to Choke-Point Navigation .....	4908
<i>Yu-Hsiang Su, Alexander Lanzon</i>	
Decentralized Model Predictive Control for Equilibrium-Based Collaborative UAV Bar Transportation .....	4915
<i>Roberto C. Sundin, Pedro Roque, Dimos V. Dimarogonas</i>	
Stackelberg Strategic Guidance for Heterogeneous Robots Collaboration .....	4922
<i>Yuhan Zhao, Baichuan Huang, Jingjin Yu, Quanyan Zhu</i>	
Providing Local Resilience to Vulnerable Areas in Robotic Networks.....	4929
<i>Matthew Cavorsi, Stephanie Gil</i>	
Secure Multi-Robot Information Sampling with Periodic and Opportunistic Connectivity.....	4951
<i>Tamim Samman, Ayan Dutta, O. Patrick Kreidl, Swapnoneel Roy, Ladislau Bölöni</i>	
Driving Swarm: A Swarm Robotics Framework for Intelligent Navigation in a Self-Organized World.....	4958
<i>Sebastian Mai, Nele Traichel, Sanaz Mostaghim</i>	
Dynamic Robot Chain Networks for Swarm Foraging .....	4965
<i>Dohee Lee, Qi Lu, Tsz-Chiu Au</i>	
On the Convergence of Multi-Robot Constrained Navigation: A Parametric Control Lyapunov Function Approach.....	4972
<i>Bowen Weng, Hua Chen, Wei Zhang</i>	
Distributed Swarm Trajectory Optimization for Formation Flight in Dense Environments .....	4979
<i>Lun Quan, Longji Yin, Chao Xu, Fei Gao</i>	
Optimizing Camera Placements for Overlapped Coverage with 3D Camera Projections.....	5002
<i>Akshay Malhotra, Dhananjay Singh, Tushar Dadlani, Luis Yoichi Morales</i>	
Star-Convolution for Image-Based 3D Object Detection.....	5018
<i>Yuxuan Liu, Zhenhua Xu, Ming Liu</i>	
Digital Twin with Integrated Robot-Human/Environment Interaction Dynamics for an Industrial Mobile Manipulator.....	5041
<i>Zhengxue Zhou, Xingyu Yang, Hao Wang, Xuping Zhang</i>	
Combined Grid and Feature-Based Mapping of Metal Structures with Ultrasonic Guided Waves .....	5056
<i>Othmane-Latif Ouabi, Ayoub Ridani, Pascal Pomarede, Neil Zeghidour, Nico F. Declercq, Matthieu Geist, Cédric Pradalier</i>	
Striking the Right Balance: Recall Loss for Semantic Segmentation.....	5063
<i>Junjiao Tian, Niluthpol Chowdhury Mithun, Zachary Seymour, Han-Pang Chiu, Zsolt Kira</i>	
Exploiting Playbacks in Unsupervised Domain Adaptation for 3D Object Detection in Self-Driving Cars.....	5070
<i>Yurong You, Carlos Andres Diaz-Ruiz, Yan Wang, Wei-Lun Chao, Bharath Hariharan, Mark Campbell, Kilian Q Weinbergert</i>	
Dilated Continuous Random Field for Semantic Segmentation.....	5078
<i>Xi Mo, Xiangyu Chen, Cuncong Zhong, Rui Li, Kaidong Li, Usman Sajid</i>	

Unseen Object Amodal Instance Segmentation Via Hierarchical Occlusion Modeling.....	5085
<i>Seunghyeok Back, Joosoon Lee, Taewon Kim, Sangjun Noh, Raeyoung Kang, Seongho Bak, Kyoobin Lee</i>	
Rethinking LiDAR Object Detection in Adverse Weather Conditions .....	5093
<i>Teja Vratem, George Sebastian, Luka Lukic</i>	
WeakLabel3D-Net: A Complete Framework for Real-Scene LiDAR Point Clouds Weakly Supervised Multi-Tasks Understanding .....	5108
<i>Kangcheng Liu, Yuzhi Zhao, Zhi Gao, Ben M. Chen</i>	
Multi-Class 3D Object Detection with Single-Class Supervision .....	5123
<i>Mao Ye, Chenxi Liu, Maoqing Yao, Weiyue Wang, Zhaoqi Leng, Charles R. Qi, Dragomir Anguelov</i>	
Abstract Flow for Temporal Semantic Segmentation on the Permutohedral Lattice .....	5139
<i>Peer Schutt, Radu Alexandru Rosu, Sven Behnke</i>	
A Switchable Rigid-Continuum Robot Arm: Design and Testing .....	5162
<i>Hao Wang, Zhengxue Zhou, Xingyu Yang, Xuping Zhang</i>	
Sen-Glove: A Lightweight Wearable Glove for Hand Assistance with Soft Joint Sensing .....	5170
<i>Linan Deng, Yi Shen, Yang Hong, Yunlong Dong, Xin He, Ye Yuan, Zhi Li, Han Ding</i>	
Compensating for Material Deformation in Foldable Robots Via Deep Learning — a Case Study .....	5184
<i>Mohammad Sharifzadeh, Yuhao Jiang, Amir Salimi Lafmejani, Daniel M. Aukes</i>	
Scalable Simulation and Demonstration of Jumping Piezoelectric 2-D Soft Robots .....	5199
<i>Zhiwu Zheng, Prakhar Kumar, Yenan Chen, Hsin Cheng, Sigurd Wagner, Minjie Chen, Naveen Verma, James C. Sturm</i>	
Simulation and Fabrication of Soft Robots with Embedded Skeletons .....	5205
<i>James M. Bern, Fatemeh Zargarbashi, Annan Zhang, Josie Hughes, Daniela Rus</i>	
Reproduction of Human Demonstrations with a Soft-Robotic Arm Based on a Library of Learned Probabilistic Movement Primitives .....	5212
<i>Paris Oikonomou, Athanasios Dometios, Mehdi Khamassi, Costas S. Tzafestas</i>	
Trajectory Scaling for Reactive Motion Planning .....	5242
<i>Albin Dahlin, Yiannis Karayiannidis</i>	
Optimizing Trajectories with Closed-Loop Dynamic SQP .....	5249
<i>Sumeet Singh, Jean-Jacques Slotine, Vikas Sindhwani</i>	
GOMP-FIT: Grasp-Optimized Motion Planning for Fast Inertial Transport.....	5255
<i>Jeffrey Ichnowski, Yahav Avigal, Yi Liu, Ken Goldberg</i>	
A Simple Formulation for Fast Prioritized Optimal Control of Robots Using Weighted Exact Penalty Functions .....	5262
<i>Ajay Suresha Sathya, Wilm Decre, Goele Pipeleers, Jan Swevers</i>	
Informative Planning in the Presence of Outliers .....	5311
<i>Weizhe Chen, Lantao Liu</i>	
Dynamics-Aware Quality-Diversity for Efficient Learning of Skill Repertoires .....	5360
<i>Bryan Lim, Luca Grillotti, Lorenzo Bernasconi, Antoine Cully</i>	

Contact-Rich Manipulation of a Flexible Object Based on Deep Predictive Learning Using Vision and Tactility.....	5375
<i>Hideyuki Ichiwara, Hiroshi Ito, Kenjiro Yamamoto, Hiroki Mori, Tetsuya Ogata</i>	
Model-Based State Estimation of Two-Wheelers .....	5382
<i>Florian Wirth, Julian Wadehul, Alexander Scheid, Carlos Fernandez-Lopez, Christoph Stiller</i>	
Free Energy Principle for State and Input Estimation of a Quadcopter Flying in Wind .....	5389
<i>Fred Bas, Ajith Anil Meera, Dennis Benders, Martijn Wisse</i>	
Integrated Learning of Robot Motion and Sentences: Real-Time Prediction of Grasping Motion and Attention Based on Language Instructions.....	5404
<i>Hiroshi Ito, Hideyuki Ichiwara, Kenjiro Yamamoto, Hiroki Mori, Tetsuya Ogata</i>	
Development and Evaluation of a Gait Assistance System Based on Haptic Cane and Active Knee Orthosis .....	5419
<i>Hosu Lee, Amre Eizad, Junyeong Lee, Jungwon Yoon</i>	
Repeated Robot-Assisted Unilateral Stiffness Perturbations Result in Significant Aftereffects Relevant to Post-Stroke Gait Rehabilitation.....	5426
<i>Vaughn Chambers, Panagiotis Artemiadis</i>	
Patient-Tailored Adaptive Control for Robot-Aided Orthopaedic Rehabilitation.....	5434
<i>Christian Tamantini, Francesca Cordella, Clemente Lauretti, Francesco Scotto Di Luzio, Marco Bravi, Federica Bressi, Francesco Draicchio, Silvia Sterzi, Loredana Zollo</i>	
A Low-Profile Hip Exoskeleton for Pathological Gait Assistance: Design and Pilot Testing .....	5461
<i>Safoura Sadegh Pour Aji Bishe, Leah Liebelt, Ying Fang, Zachary F. Lerner</i>	
An Over-Actuated Bionic Knee Prosthesis: Modeling, Design and Preliminary Experimental Characterization.....	5467
<i>Lorenzo Guercini, Federico Tessari, Josephus Driessen, Stefano Buccelli, Anna Pace, Samuele De Giuseppe, Simone Traverso, Lorenzo De Michieli, Matteo Laffranchi</i>	
Preliminary Investigation of Powered Knee Prosthesis with Small-Scale, Light-Weight, and Affordable Series-Elastic Actuator for Walking Rehabilitation of a Patient with Four-Limb Deficiency .....	5474
<i>Ken Endo, Naoki Uchida, Ryusuke Morita, Tetsuo Tawara</i>	
A Novel Limbs-Free Variable Structure Wheelchair Based on Face-Computer Interface (FCI) with Shared Control.....	5480
<i>Bo Zhu, Daohui Zhang, Yaqi Chu, Xingang Zhao</i>	
CRANE: A 10 Degree-Of-Freedom, Tele-Surgical System for Dexterous Manipulation Within Imaging Bores .....	5487
<i>Dimitri Schreiber, Zhaowei Yu, Hanpeng Jiang, Taylor Henderson, Guosong Li, Julie Yu, Renjie Zhu, Alexander M. Norbash, Michael C. Yip</i>	
ROMAX: Certifiably Robust Deep Multiagent Reinforcement Learning Via Convex Relaxation.....	5503
<i>Chuangchuang Sun, Dong-Ki Kim, Jonathan P. How</i>	
Learning Emergent Discrete Message Communication for Cooperative Reinforcement Learning .....	5511
<i>Sheng Li, Yutai Zhou, Ross Allen, Mykel J. Kochenderfer</i>	

Learning Observation-Based Certifiable Safe Policy for Decentralized Multi-Robot Navigation.....	5518
<i>Yuxiang Cui, Longzhong Lin, Xiaolong Huang, Dongkun Zhang, Yunkai Wang, Wei Jing, Junbo Chen, Rong Xiong, Yue Wang</i>	
Enhancing Deep Reinforcement Learning Approaches for Multi-Robot Navigation Via Single-Robot Evolutionary Policy Search .....	5525
<i>Enrico Marchesini, Alessandro Farinelli</i>	
Barrier Function-Based Safe Reinforcement Learning for Formation Control of Mobile Robots .....	5532
<i>Xinglong Zhang, Yaoqian Peng, Wei Pan, Xin Xu, Haibin Xie</i>	
Bayesian Optimisation for Robust Model Predictive Control Under Model Parameter Uncertainty .....	5539
<i>Rel Guzman, Rafael Oliveira, Fabio Ramos</i>	
Asynchronous Reinforcement Learning for Real-Time Control of Physical Robots .....	5546
<i>Yufeng Yuan, A. Rupam Mahmood</i>	
From Scratch to Sketch: Deep Decoupled Hierarchical Reinforcement Learning for Robotic Sketching Agent .....	5553
<i>Ganghun Lee, Minji Kim, Minsu Lee, Byoung-Tak Zhang</i>	
Robust Reinforcement Learning Via Genetic Curriculum .....	5560
<i>Yeeho Song, Jeff Schneider</i>	
Improving Safety in Deep Reinforcement Learning Using Unsupervised Action Planning .....	5567
<i>Hao-Lun Hsu, Qiuhua Huang, Sehoon Ha</i>	
CT-ICP: Real-Time Elastic LiDAR Odometry with Loop Closure.....	5580
<i>Pierre Dellenbach, Jean-Emmanuel Deschaud, Bastien Jacquet, François Goulette</i>	
SAGE: SLAM with Appearance and Geometry Prior for Endoscopy.....	5587
<i>Xingtong Liu, Zhaoshuo Li, Masaru Ishii, Gregory D. Hager, Russell H. Taylor, Mathias Unberath</i>	
360VO: Visual Odometry Using a Single 360 Camera.....	5594
<i>Huajian Huang, Sai-Kit Yeung</i>	
Towards Scale Consistent Monocular Visual Odometry by Learning from the Virtual World.....	5601
<i>Sen Zhang, Jing Zhang, Dacheng Tao</i>	
Performance Guarantees for Spectral Initialization in Rotation Averaging and Pose-Graph SLAM.....	5608
<i>Kevin J. Doherty, David M. Rosen, John J. Leonard</i>	
VIP-SLAM: An Efficient Tightly-Coupled RGB-D Visual Inertial Planar SLAM.....	5615
<i>Danpeng Chen, Shuai Wang, Weijian Xie, Shangjin Zhai, Nan Wang, Hujun Bao, Guofeng Zhang</i>	
Globally Consistent and Tightly Coupled 3D LiDAR Inertial Mapping.....	5622
<i>Kenji Koide, Masashi Yokozuka, Shuji Oishi, Atsuhiko Banno</i>	
Deep Networks for Point Cloud Map Validation .....	5629
<i>Nicole Camous, Sergi Adiprajaja Widjaja, Venice Erin Liong, Taigo Maria Bonanni</i>	
Unified Representation of Geometric Primitives for Graph-SLAM Optimization Using Decomposed Quadrics.....	5636
<i>Weikun Zhen, Huai Yu, Yaoyu Hu, Sebastian Scherer</i>	

DKNAS: A Practical Deep Keypoint Extraction Framework Based on Neural Architecture Search .....	5643
<i>Li Liu, Xing Cai, Ge Li, Thomas H Li</i>	
Instinctive Real-Time sEMG-Based Control of Prosthetic Hand with Reduced Data Acquisition and Embedded Deep Learning Training.....	5666
<i>Zeyu Yang, Angus B. Clark, Digby Chappell, Nicolas Rojas</i>	
Stair Ascent Phase-Variable Control of a Powered Knee-Ankle Prosthesis.....	5673
<i>Ross J. Cortino, Edgar Bolívar-Nieto, T. Kevin Best, Robert D. Gregg</i>	
Tenodesis Grasp Emulator: Kinematic Assessment of Wrist-Driven Orthotic Control .....	5679
<i>Erin Y. Chang, Raghid Mardini, Andrew I. W. McPherson, Yuri Gloumakov, Hannah S. Stuart</i>	
Comprehensive Swing Leg Motion Predictor for Steady and Transient Walking Conditions .....	5686
<i>Haosen Xing, Saurav Kumar, Hartmut Geyer</i>	
A Hybrid, Soft Robotic Exoskeleton Glove with Inflatable, Telescopic Structures and a Shared Control Operation Scheme .....	5693
<i>Lucas Gerez, Gal Gorjup, Yuran Zhou, Minas Liarokapis</i>	
Designing a Highly Backdrivable and Kinematic Compatible Magneto-Rheological Knee Exoskeleton .....	5724
<i>Rafhael M. Andrade, Pedro H. F. Ulhoa, Claysson B. S. Vimieiro</i>	
A Novel Assistive Controller Based on Differential Geometry for Users of the Differential-Drive Wheeled Mobile Robots .....	5755
<i>Seyed Amir Tafriahi, Ankit A. Ravankar, Jose Victorio Salazar Luces, Yasuhisa Hirata</i>	
Trajectory Optimization Formulation with Smooth Analytical Derivatives for Track-Leg and Wheel-Leg Ground Robots.....	5762
<i>Adwait Mane, Dylan Swart, Jason White, Christian Hubicki</i>	
Development of a Collaborative Wheeled Mobile Robot: Design Considerations, Drive Unit Torque Control, and Preliminary Result.....	5769
<i>Mehmet C. Yildirim, Mohamadreza Sabaghian, Thore Goll, Clemens Kössler, Christoph Jähne, Abdalla Swikir, Andriy Sarabakha, Sami Haddadin</i>	
Improved Soft Duplicate Detection in Search-Based Motion Planning .....	5792
<i>Nader Maray, Anirudh Vemula, Maxim Likhachev</i>	
Enhancing Maneuverability Via Gait Design.....	5799
<i>Siming Deng, Ross L. Hatton, Noah J. Cowan</i>	
Analyzing Multiagent Interactions in Traffic Scenes Via Topological Braids.....	5806
<i>Christoforos Mavrogiannis, Jonathan Decastro, Siddhartha S. Srinivasa</i>	
Jerk Constrained Velocity Planning for an Autonomous Vehicle: Linear Programming Approach .....	5814
<i>Yutaka Shimizu, Takamasa Horibe, Fumiya Watanabe, Shinpei Kato</i>	
Improving Haptic Exploration of Object Shape by Discovering Symmetries .....	5821
<i>Aramis Augusto Bonzini, Lucia Seminara, Lorenzo Jamone</i>	
Barrier Forming: Separating Polygonal Sets with Minimum Number of Lines .....	5828
<i>Si Wei Feng, Jingjin Yu</i>	



Anti-Collision Static Rotation Local Planner for Four Independent Steering Drive Self-Reconfigurable Robot.....	5835
<i>Lim Yi, Anh Vu Le, A. A. Hayat, K. Elangovan, K. Leong, A. Povendhan, M. R. Elara</i>	
1D-LRF Aided Visual-Inertial Odometry for High-Altitude MAV Flight.....	5858
<i>Jiaxin Hu, Jun Hu, Yunjun Shen, Xiaoming Lang, Bo Zang, Guoquan Huang, Yinian Mao</i>	
Insulator Aiming Using Multi-Feature Fusion-Based Visual Servo Control for Washing Drone.....	5865
<i>Jian Di, Shaofeng Chen, Xinghu Wang, Hepeng Zhang, Haibo Ji</i>	
Learning Model Predictive Control for Quadrotors .....	5872
<i>Guanrui Li, Alex Tuncchez, Giuseppe Loianno</i>	
Nonlinear Model Identification and Observer Design for Thrust Estimation of Small-Scale Turbojet Engines.....	5879
<i>Affaf Junaid Ahamad Momin, Gabriele Nava, Giuseppe L'Erario, Hosameldin Awadalla Omer Mohamed, Fabio Bergonti, Punith Reddy Vanteddu, Francesco Braghin, Daniele Pucci</i>	
LADC: Learning-Based Anti-Disturbance Control for Washing Drone .....	5886
<i>Jian Di, Shaofeng Chen, Han Yan, Xinghu Wang, Hepeng Zhang, Haibo Ji, Tao Jin</i>	
Ad <sup>2</sup> Attack: Adaptive Adversarial Attack on Real-Time UAV Tracking.....	5893
<i>Changhong Fu, Sihang Li, Xinnan Yuan, Junjie Ye, Ziang Cao, Fangqiang Ding</i>	
Active Autorotation of Micro Aerial Vehicle with Foldable Winged Shell for Impact Mitigation During Free Fall .....	5908
<i>Quek Ching Alvin, Kazunori Ohno, Yoshito Okada, Daiki Fujikura, Satoshi Abe, Masaki Takahashi, Zitong Han, Satoshi Tadokoro</i>	
Infrastructure-Enabled Autonomy: An Attention Mechanism for Occlusion Handling.....	5939
<i>Victoria Magdalena Dax, Mykel J. Kochenderfer, Ransalu Senanayake, Umair Ibrahim</i>	
Gaussian Process Self-Triggered Policy Search in Weakly Observable Environments.....	5946
<i>Hikaru Sasaki, Terushi Hirabayashi, Kaoru Kawabata, Takamitsu Matsubara</i>	
Online Payload Identification for Tactile Robots Using the Momentum Observer.....	5953
<i>Alexander Kurdas, Mazin Hamad, Jonathan Vorndamme, Nico Mansfeld, Saeed Abdolshah, Sami Haddadin</i>	
Real-Time Inertial Parameter Identification of Floating-Base Robots Through Iterative Primitive Shape Division .....	5960
<i>Jiafeng Xu, Yu Zheng, Xinyang Jiang, Sicheng Yang, Lingzhu Xiang, Zhengyou Zhang</i>	
UnDAF: A General Unsupervised Domain Adaptation Framework for Disparity Or Optical Flow Estimation.....	5991
<i>Hengli Wang, Rui Fan, Peide Cai, Ming Liu, Lujia Wang</i>	
Localization of a Smart Infrastructure Fisheye Camera in a Prior Map for Autonomous Vehicles .....	5998
<i>Subodh Mishra, Armin Parchami, Enrique Corona, Punarjay Chakravarty, Ankit Vora, Devarth Parikh, Gaurav Pandey</i>	
ARChemist: Autonomous Robotic Chemistry System Architecture.....	6013
<i>Hatem Fakhruldeen, Gabriella Pizzuto, Jakub Glowacki, Andrew Ian Cooper</i>	
Improved State Propagation Through AI-Based Pre-Processing and Down-Sampling of High-Speed Inertial Data.....	6084
<i>Jan Steinbrener, Christian Brommer, Thomas Jantos, Alessandro Fornasier, Stephan Weiss</i>	

Hydraulically Actuated Soft Tubular Gripper .....	6144
<i>James Davies, Phuoc Thien Phan, Diana Huang, Trung Thien Hoang, Harrison Low, Mai Thanh Thai, Chi Cong Nguyen, Emanuele Nicotra, Nigel H. Lovell, Thanh Nho Do</i>	
TaTa: A Universal Jamming Gripper with High-Quality Tactile Perception and Its Application to Underwater Manipulation.....	6151
<i>Shoujie Li, Xianghui Yin, Chongkun Xia, Linqi Ye, Xueqian Wang, Bin Liang</i>	
Mechanical Search on Shelves Using a Novel “Bluction” Tool.....	6158
<i>Huang Huang, Michael Danielczuk, Chung Min Kim, Letian Fu, Zachary Tam, Jeffrey Ichnowski, Anelia Angelova, Brian Ichter, Ken Goldberg</i>	
The Wavejoints: A Novel Methodology to Design Soft-Rigid Grippers Made by Monolithic 3D Printed Fingers with Adjustable Joint Stiffness.....	6173
<i>Mihai Dragusanu, Gabriele Maria Achilli, Maria Cristina Valigi, Domenico Prattichizzo, Monica Malvezzi, Gionata Salvietti</i>	
IPC-GraspSim: Reducing the Sim2Real Gap for Parallel-Jaw Grasping with the Incremental Potential Contact Model.....	6180
<i>Chung Min Kim, Michael Danielczuk, Isabella Huang, Ken Goldberg</i>	
DenseTact: Optical Tactile Sensor for Dense Shape Reconstruction .....	6188
<i>Won Kyung Do, Monroe Kennedy</i>	
Contact Transfer: A Direct, User-Driven Method for Human to Robot Transfer of Grasps and Manipulations.....	6195
<i>Arjun Lakshminpathy, Dominik Bauer, Cornelia Bauer, Nancy S. Pollard</i>	
Microgripper Using Flexible Wire Hinge for Robotic Intraocular Snake .....	6218
<i>Makoto Jinno, Iulian Iordachita</i>	
Explore-Bench: Data Sets, Metrics and Evaluations for Frontier-Based and Deep-Reinforcement-Learning-Based Autonomous Exploration .....	6225
<i>Yuanfan Xu, Jincheng Yu, Jiahao Tang, Jiantao Qiu, Jian Wang, Yuan Shen, Yu Wang, Huazhong Yang</i>	
A Deep Reinforcement Learning Environment for Particle Robot Navigation and Object Manipulation .....	6232
<i>Jeremy Shen, Erdong Xiao, Yuchen Liu, Chen Feng</i>	
Generalized Affordance Templates for Mobile Manipulation.....	6240
<i>Stephen Hart, Ana Huamán Quispe, Michael W. Lanighan, Seth Gee</i>	
Understanding Xacro Misunderstandings.....	6247
<i>Nicholas Albergo, Vivek Rathi, John-Paul Ore</i>	
GRiD: GPU-Accelerated Rigid Body Dynamics with Analytical Gradients.....	6253
<i>Brian Plancher, Sabrina M. Neuman, Radhika Ghosal, Scott Kuindersma, Vijay Janapa Reddi</i>	
Brick Yourself Within 3 Minutes .....	6261
<i>Guyue Zhou, Liyi Luo, Hao Xu, Xinliang Zhang, Haole Guo, Hao Zhao</i>	
FishGym: A High-Performance Physics-Based Simulation Framework for Underwater Robot Learning .....	6268
<i>Wenji Liu, Kai Bai, Xuming He, Shuran Song, Changxi Zheng, Xiaopei Liu</i>	

Put the Bear on the Chair! Intelligent Robot Interaction with Previously Unseen Chairs Via Robot Imagination.....	6276
<i>Hongtao Wu, Xin Meng, Sipu Ruan, Gregory S. Chirikjian</i>	
StructFormer: Learning Spatial Structure for Language-Guided Semantic Rearrangement of Novel Objects.....	6322
<i>Weiyu Liu, Chris Paxton, Tucker Hermans, Dieter Fox</i>	
InsertionNet 2.0: Minimal Contact Multi-Step Insertion Using Multimodal Multiview Sensory Input .....	6330
<i>Oren Spector, Vladimir Tchuiev, Dotan Di Castro</i>	
Data-Efficient Learning of Object-Centric Grasp Preferences .....	6337
<i>Yoann Fleytoux, Anji Ma, Serena Ivaldi, Jean-Baptiste Mouret</i>	
Provably Safe Deep Reinforcement Learning for Robotic Manipulation in Human Environments.....	6344
<i>Jakob Thumm, Matthias Althoff</i>	
Search-Based Task Planning with Learned Skill Effect Models for Lifelong Robotic Manipulation.....	6351
<i>Jacky Liang, Mohit Sharma, Alex Lagrassa, Shivam Vats, Saumya Saxena, Oliver Kroemer</i>	
Reinforcement Learning for Picking Cluttered General Objects with Dense Object Descriptors.....	6358
<i>Hoang-Giang Cao, Weihao Zeng, I-Chen Wu</i>	
A Hybrid Approach for Learning to Shift and Grasp with Elaborate Motion Primitives.....	6365
<i>Zohar Feldman, Hanna Ziesche, Ngo Anh Vien, Dotan Di Castro</i>	
Affordance Learning from Play for Sample-Efficient Policy Learning.....	6372
<i>Jessica Borja-Diaz, Oier Mees, Gabriel Kalweit, Lukas Hermann, Joschka Boedecker, Wolfram Burgard</i>	
Stable Object Reorientation Using Contact Plane Registration.....	6379
<i>Richard Li, Carlos Esteves, Ameesh Makadia, Pulkit Agrawal</i>	
Offline Meta-Reinforcement Learning for Industrial Insertion .....	6386
<i>Tony Z. Zhao, Jianlan Luo, Oleg Sushkov, Rugile Pevceviute, Nicolas Heess, Jon Scholz, Stefan Schaal, Sergey Levine</i>	
Neural Descriptor Fields: SE(3)-Equivariant Object Representations for Manipulation .....	6394
<i>Anthony Simeonov, Yilun Du, Andrea Tagliasacchi, Joshua B. Tenenbaum, Alberto Rodriguez, Pulkit Agrawal, Vincent Sitzmann</i>	
CaTGrasp: Learning Category-Level Task-Relevant Grasping in Clutter from Simulation .....	6401
<i>Bowen Wen, Wenzhao Lian, Kostas Bekris, Stefan Schaal</i>	
HMD-Former: A Transformer-Based Human Mesh Deformer with Inter-Layer Semantic Consistency .....	6409
<i>Siyu Zou, Sheng Liu, Chaonan Li, Lu Yao, Shengyong Chen</i>	
Augmented Pointing Gesture Estimation for Human-Robot Interaction.....	6416
<i>Zhixian Hu, Yingtian Xu, Waner Lin, Ziya Wang, Zhenglong Sun</i>	
Dual Regression for Efficient Hand Pose Estimation.....	6423
<i>Dong Wei, Shan An, Xiajie Zhang, Jiayi Tian, Konstantinos A. Tsintotas, Antonios Gasteratos, Haogang Zhu</i>	

Path-Aware Graph Attention for HD Maps in Motion Prediction.....	6430
<i>Fang Da, Yu Zhang</i>	
Exact-Likelihood User Intention Estimation for Scene-Compliant Shared-Control Navigation.....	6437
<i>Kavindie Katuwandeniya, Stefan H. Kiss, Lei Shi, Jaime Valls Miro</i>	
Using Arm Swing Movements to Maintain the Walking State in a Self-Balanced Lower-Limb Exoskeleton .....	6444
<i>Omar Mounir Alaoui, Fabien Expert, Guillaume Morel, Nathanaël Jarrassé</i>	
Cost-Effective Sensing for Goal Inference: A Model Predictive Approach.....	6451
<i>Ran Tian, Nan Li, Anouck Girard, Ilya Kolmanovsky, Masayoshi Tomizuka</i>	
A Data-Driven Multiple Model Framework for Intention Estimation.....	6458
<i>Yongming Qin, Makoto Kumon, Tomonari Furukawa</i>	
Monitoring the Mental State of Cooperativeness for Guiding an Elderly Person in Sit-To-Stand Assistance.....	6465
<i>John Bell, H. Harry Asada</i>	
NeRF-Supervision: Learning Dense Object Descriptors from Neural Radiance Fields.....	6496
<i>Lin Yen-Chen, Pete Florence, Jonathan T. Barron, Tsung-Yi Lin, Alberto Rodriguez, Phillip Isola</i>	
Fusion-FlowNet: Energy-Efficient Optical Flow Estimation Using Sensor Fusion and Deep Fused Spiking-Analog Network Architectures .....	6504
<i>Chankyu Lee, Adarsh Kumar Kosta, Kaushik Roy</i>	
SelfTune: Metrically Scaled Monocular Depth Estimation Through Self-Supervised Learning .....	6511
<i>Jaehoon Choi, Dongki Jung, Yonghan Lee, Deokhwa Kim, Dinesh Manocha, Donghwan Lee</i>	
Deep Bayesian ICP Covariance Estimation .....	6519
<i>Andrea De Maio, Simon Lacroix</i>	
UFODepth: Unsupervised Learning with Flow-Based Odometry Optimization for Metric Depth Estimation.....	6526
<i>Vlad Licaret, Victor Robu, Alina Marcu, Dragos Costea, Emil Slusanschi, Rahul Sukthankar, Marius Leordeanu</i>	
<i>f</i> -Cal: Aleatoric Uncertainty Quantification for Robot Perception Via Calibrated Neural Regression.....	6533
<i>Dhaivat Bhatt, Kaustubh Mani, Dishank Bansal, Krishna Murthy, Hanju Lee, Liam Paull</i>	
Monocular Depth Distribution Alignment with Low Computation.....	6548
<i>Fei Sheng, Feng Xue, Yicong Chang, Wenteng Liang, Anlong Ming</i>	
Vision-Based Ascending Staircase Detection with Interpretable Classification Model for Stair Climbing Robots.....	6564
<i>Kangneoung Lee, Vishnu Kalyanram, Chuanqi Zheng, Siddharth Sane, Kiju Lee</i>	
Temporally-Aggregating Multiple-Discontinuous-Image Saliency Prediction with Transformer-Based Attention .....	6571
<i>Pin-Jie Huang, Chi-An Lu, Kuan-Wen Chen</i>	
Convex Model Predictive Control of Single Rigid Body Model on SO(3) for Versatile Dynamic Legged Motions.....	6586
<i>Junjie Shen, Dennis Hong</i>	

Planning Natural Locomotion for Articulated Soft Quadrupeds .....	6593
<i>Mathew Jose Pollayil, Cosimo Della Santina, George Mesesan, Johannes Engelsberger, Daniel Seidel, Manolo Garabini, Christian Ott, Antonio Bicchi, Alin Albu-Schaffer</i>	
Hybrid Event Shaping to Stabilize Periodic Hybrid Orbits .....	6600
<i>James Zhu, Nathan J. Kong, George Council, Aaron M. Johnson</i>	
Humanoid Arm Motion Planning for Improved Disturbance Recovery Using Model Hierarchy Predictive Control.....	6607
<i>Charles Khazoom, Sangbae Kim</i>	
Design of KAIST HOUND, a Quadruped Robot Platform for Fast and Efficient Locomotion with Mixed-Integer Nonlinear Optimization of a Gear Train.....	6614
<i>Young-Ha Shin, Seungwoo Hong, Sangyoung Woo, Jonghun Choe, Harim Son, Gijeong Kim, Joon-Ha Kim, Kangkyu Lee, Jemin Hwangbo, Hae-Won Park</i>	
Rapid and Reliable Quadruped Motion Planning with Omnidirectional Jumping .....	6621
<i>Matthew Chignoli, Savva Morozov, Sangbae Kim</i>	
Nonprehensile Object Transportation with a Legged Manipulator .....	6628
<i>Viviana Morlando, Mario Selvaggio, Fabio Ruggiero</i>	
A Novel Model of Interaction Dynamics Between Legged Robots and Deformable Terrain .....	6635
<i>Anthony Vanderkop, Navinda Kottege, Thierry Peynot, Peter Corke</i>	
DURableVS: Data-Efficient Unsupervised Recalibrating Visual Servoing Via Online Learning in a Structured Generative Model.....	6674
<i>Nishad Gothoskar, Miguel Lazaro-Gredilla, Yasemin Bekiroglu, Abhishek Agarwal, Joshua B. Tenenbaum, Vikash K. Mansinghka, Dileep George</i>	
Visual Perception of Robot Appearance Attributes in the Peripheral Field of View Depends on Human Observer Eye-Movement Behaviors.....	6736
<i>Kolja Kühnlenz, Barbara Kühnlenz</i>	
Admittance Control Based Human-In-The-Loop Optimization for Hip Exoskeleton Reduces Human Exertion During Walking.....	6743
<i>Varun Nalam, Xikai Tu, Minhan Li, Jennie Si, He Helen Huang</i>	
Go with the Flow: Energy Minimising Periodic Trajectories for UVMS.....	6763
<i>Wilhelm J. Marais, Stefan B. Williams, Oscar Pizarro</i>	
ROZZ: Property-Based Fuzzing for Robotic Programs in ROS.....	6786
<i>Kai-Tao Xie, Jia-Ju Bai, Yong-Hao Zou, Yu-Ping Wang</i>	
Enhancing Data-Driven Reachability Analysis Using Temporal Logic Side Information .....	6793
<i>Amr Alanwar, Frank J. Jiang, Maryam Sharifi, Dimos V. Dimarogonas, Karl H. Johansson</i>	
Formal Verification of Stochastic Systems with ReLU Neural Network Controllers .....	6800
<i>Shiqi Sun, Yan Zhang, Xusheng Luo, Panagiotis Vlantis, Miroslav Pajic, Michael M. Zavlanos</i>	
Recursive Feasibility Guided Optimal Parameter Adaptation of Differential Convex Optimization Policies for Safety-Critical Systems .....	6807
<i>Hardik Parwana, Dimitra Panagou</i>	

Automated Testing with Temporal Logic Specifications for Robotic Controllers Using Adaptive Experiment Design .....	6814
<i>Craig Innes, Subramanian Ramamoorthy</i>	
Back to the Future: Efficient, Time-Consistent Solutions in Reach-Avoid Games.....	6830
<i>Dennis R. Anthony, Duy P. Nguyen, David Fridovich-Keil, Jaime F. Fisac</i>	
Multi-Robot Persistent Environmental Monitoring Based on Constraint-Driven Execution of Learned Robot Tasks .....	6853
<i>Gennaro Notomista, Claudio Pacchierotti, Paolo Robuffo Giordano</i>	
Free-Space Ellipsoid Graphs for Multi-Agent Target Monitoring .....	6860
<i>Aaron Ray, Alyssa Pierson, Daniela Rus</i>	
ROS2SWARM - A ROS 2 Package for Swarm Robot Behaviors .....	6875
<i>Tanja Katharina Kaiser, Marian Johannes Begemann, Tavia Plattenteich, Lars Schilling, Georg Schildbach, Heiko Hamann</i>	
MOSAIX: A Swarm of Robot Tiles for Social Human-Swarm Interaction .....	6882
<i>Merihan Alhafnawi, Edmund R. Hunt, Severin Lemaignan, Paul O'Dowd, Sabine Hauert</i>	
Multi-Operator Control of Connectivity-Preserving Robot Swarms Using Supervisory Control Theory .....	6889
<i>Genki Miyauchi, Yuri K. Lopes, Roderich Groß</i>	
Distributed Three Dimensional Flocking of Autonomous Drones .....	6904
<i>Dario Albani, Tiziano Manoni, Martin Saska, Eliseo Ferrante</i>	
Learning to Swarm with Knowledge-Based Neural Ordinary Differential Equations .....	6912
<i>Tom Z. Jiahao, Lishuo Pan, M. Ani Hsieh</i>	
DORA: Distributed Online Risk-Aware Explorer.....	6919
<i>David Viefmaure, Samuel Arseneault, Pierre-Yves Lajoie, Giovanni Beltrame</i>	
HandoverSim: A Simulation Framework and Benchmark for Human-To-Robot Object Handovers .....	6941
<i>Yu-Wei Chao, Chris Paxton, Yu Xiang, Wei Yang, Balakumar Sundaralingam, Tao Chen, Adithyavairavan Murali, Maya Cakmak, Dieter Fox</i>	
Model Predictive Control with Gaussian Processes for Flexible Multi-Modal Physical Human Robot Interaction.....	6948
<i>Kevin Haninger, Christian Hegeler, Luka Peternel</i>	
Model Predictive Control for Fluid Human-To-Robot Handovers.....	6956
<i>Wei Yang, Balakumar Sundaralingam, Chris Paxton, Ireteayo Akinola, Yu-Wei Chao, Maya Cakmak, Dieter Fox</i>	
Control Scheme for Sideways Walking on a User-Driven Treadmill .....	6963
<i>Sanghun Pyo, Hoyoung Kim, Jungwon Yoon</i>	
A Quantitative Analysis of Activities of Daily Living: Insights into Improving Functional Independence with Assistive Robotics.....	6999
<i>Laura Petrich, Jun Jin, Masood Dehghan, Martin Jagersand</i>	
Opto-Electrotactile Feedback Enabled Text-Line Tracking Control for a Finger-Wearable Reading Aid for the Blind.....	7007
<i>Mehdi Rahimi, Yantao Shen, Cong Peng, Zhiming Liu, Fang Jiang</i>	

Admittance Model Optimization for Gait Balance Assistance of a Robotic Walker: Passive Model-Based Mechanical Assessment.....	7014
<i>Shunki Itadera, Gordon Cheng</i>	
A Divide-And-Merge Point Cloud Clustering Algorithm for LiDAR Panoptic Segmentation .....	7029
<i>Yiming Zhao, Xiao Zhang, Xinming Huang</i>	
Segmentation and Shape Estimation of Multiple Deformed Cloths Using a CNN-Based Landmark Detector and Clustering.....	7043
<i>Daiki Sonogawa, Koichi Ogawara</i>	
Enhanced Prototypical Learning for Unsupervised Domain Adaptation in LiDAR Semantic Segmentation .....	7058
<i>Eojindl Yi, Juyoung Yang, Junmo Kim</i>	
ShapeMap 3-D: Efficient Shape Mapping Through Dense Touch and Vision.....	7073
<i>Sudharshan Suresh, Zilin Si, Joshua G. Mangelson, Wenzhen Yuan, Michael Kaess</i>	
Design and Evaluation of Object Classifiers for Probabilistic Decision-Making in Autonomous Systems.....	7089
<i>Hamad Ullah, Weisi Fan, Tichakorn Wongpiromsarn</i>	
Dynamic Underactuated Manipulator Using a Flexible Body with a Structural Anisotropy .....	7117
<i>Akihiro Maruo, Akihide Shibata, Mitsuru Higashimori</i>	
A Novel Hydrogel-Based Connection Mechanism for Soft Modular Robots .....	7124
<i>Antonio López-Díaz, Jesús De La Morena, Francisco Ramos, Ester Vázquez, Andrés S. Vázquez</i>	
Printable Origami Bistable Structures for Foldable Jumpers .....	7131
<i>Tung D. Ta, Zekun Chang, Koya Narumi, Takuya Umedachi, Yoshihiro Kawahara</i>	
Towards a Microfluidic Microcontroller Circuit Library for Soft Robots.....	7138
<i>Elizabeth Gallardo Hevia, Louis De La Rochefoucauld, Robert J. Wood</i>	
Task-Specific Design Optimization and Fabrication for Inflated-Beam Soft Robots with Growable Discrete Joints .....	7145
<i>Ioannis Exarchos, Karen Wang, Brian H. Do, Fabio Stroppa, Margaret M. Coad, Allison M. Okamura, C. Karen Liu</i>	
Repeated Jumping with the REBOund: Self-Righting Jumping Robot Leveraging Bistable Origami-Inspired Design.....	7189
<i>Yuchen Sun, Joanna Wang, Cynthia Sung</i>	
Kinematic Transfer Learning of Sampling Distributions for Manipulator Motion Planning .....	7211
<i>Peter Lehner, Máximo A. Roa, Alin Albu-Schäffer</i>	
Human-Guided Motion Planning in Partially Observable Environments .....	7226
<i>Carlos Quintero-Peña, Constantinos Chamzas, Zhanyi Sun, Vaibhav Unhelkar, Lydia E. Kavraki</i>	
Learning to Retrieve Relevant Experiences for Motion Planning .....	7233
<i>Constantinos Chamzas, Aedan Cullen, Anshumali Shrivastava, Lydia E. Kavraki</i>	
Fast Footstep Planning on Uneven Terrain Using Deep Sequential Models.....	7241
<i>Hersh Sanghvi, Camillo Jose Taylor</i>	

Realtime Trajectory Smoothing with Neural Nets .....	7248
<i>Shohei Fujii, Quang-Cuong Pham</i>	
HR-Planner: A Hierarchical Highway Tactical Planner Based on Residual Reinforcement Learning .....	7263
<i>Haoran Wu, Yueyuan Li, Hanyang Zhuang, Chunxiang Wang, Ming Yang</i>	
Safe Multi-Agent Motion Planning Via Filtered Reinforcement Learning .....	7270
<i>Abraham P. Vinod, Sleiman Sifaoui, Ankush Chakrabarty, Rien Quirynen, Nobuyuki Yoshikawa, Stefano Di Cairano</i>	
Efficient Object Manipulation to an Arbitrary Goal Pose: Learning-Based Anytime Prioritized Planning.....	7277
<i>Kechun Xu, Hongxiang Yu, Renlang Huang, Dashun Guo, Yue Wang, Rong Xiong</i>	
Interactive Human-In-The-Loop Coordination of Manipulation Skills Learned from Demonstration .....	7292
<i>Meng Guo, Mathias Bürger</i>	
APF-RL: Safe Mapless Navigation in Unknown Environments .....	7299
<i>Kemal Bektas, H. Isil Bozma</i>	
A Double Branch Next-Best-View Network and Novel Robot System for Active Object Reconstruction.....	7306
<i>Yiheng Han, Irvin Haoze Zhan, Wang Zhao, Yong-Jin Liu</i>	
Towards Optimal Correlational Object Search.....	7313
<i>Kaiyu Zheng, Rohan Chitnis, Yoonchang Sung, George Konidaris, Stefanie Tellex</i>	
Reactive Informative Planning for Mobile Manipulation Tasks Under Sensing and Environmental Uncertainty .....	7320
<i>Mariliza Tzes, Vasileios Vasilopoulos, Yiannis Kantaros, George J. Pappas</i>	
Receding Horizon Tracking of an Unknown Number of Mobile Targets Using a Bearings-Only Sensor.....	7327
<i>James D. Turner, James McMahon, Michael M. Zavlanos</i>	
On the Role of Hyperdimensional Computing for Behavioral Prioritization in Reactive Robot Navigation Tasks.....	7335
<i>Alisha Menon, Anirudh Natarajan, Laura I. Galindez Olascoaga, Youbin Kim, Braeden Benedict, Jan M. Rabaey</i>	
A Hierarchical Deliberative-Reactive System Architecture for Task and Motion Planning in Partially Known Environments .....	7342
<i>Vasileios Vasilopoulos, Sebastian Castro, William Vega-Brown, Daniel E. Koditschek, Nicholas Roy</i>	
Automatic Biopsy Tool Presence and Episode Recognition in Robotic Bronchoscopy Using a Multi-Task Vision Transformer Network.....	7349
<i>Mingyi Zheng, Menglong Ye, Hedyeh Rafii-tari</i>	
NeuroErgo: A Deep Neural Network Method to Improve Postural Optimization for Ergonomic Human-Robot Collaboration .....	7372
<i>Atieh Merikh Nejadasl, Omid Gheibi, Greet Van De Perre, Bram Vanderborght</i>	
Incorporating Rich Social Interactions into MDPs.....	7395
<i>Ravi Tejwani, Yen-Ling Kuo, Tianmin Shu, Bennett Stankovits, Dan Gutfreund, Joshua B. Tenenbaum, Boris Katz, Andrei Barbu</i>	



Developing the Bottom-Up Attentional System of a Social Robot .....	7402
<i>Randy Gomez, Álvaro Páez, Yu Fang, Serge Thill, Luis Merino, Eric Nichols, Keisuke Nakamura, Heike Brock</i>	
Let Them Have Bubbles! Filling Gaps in Toy-Like Behaviors for Child-Robot Interaction .....	7417
<i>Ameer Helmi, Samantha Noregaard, Natasha Giuliotti, Samuel W. Logan, Naomi T. Fitter</i>	
Communicating Robot Conventions Through Shared Autonomy .....	7423
<i>Ananth Jonnavittula, Dylan P. Losey</i>	
Bidirectional Communication Control for Human-Robot Collaboration .....	7430
<i>Davide Ferrari, Federico Benzi, Cristian Secchi</i>	
Learning Latent Actions Without Human Demonstrations .....	7437
<i>Shaunak A. Mehta, Sagar Parekh, Dylan P. Losey</i>	
Design by Robot: A Human-Robot Collaborative Framework for Improving Productivity of a Floor Cleaning Robot.....	7444
<i>M. A. Viraj J. Muthugala, S. M. Bhagya P. Samarakoon, Mohan Rajesh Elara</i>	
Learning Design and Construction with Varying-Sized Materials Via Prioritized Memory Resets .....	7469
<i>Yunfei Li, Tao Kong, Lei Li, Yi Wu</i>	
Augmenting Reinforcement Learning with Behavior Primitives for Diverse Manipulation Tasks.....	7477
<i>Soroush Nasiriany, Huihan Liu, Yuke Zhu</i>	
Off Environment Evaluation Using Convex Risk Minimization.....	7485
<i>Pulkit Katdare, Shuijing Liu, Katherine Driggs Campbell</i>	
RAPID-RL: A Reconfigurable Architecture with Preemptive-Exits for Efficient Deep- Reinforcement Learning .....	7492
<i>Adarsh Kumar Kosta, Malik Aqeel Anwar, Priyadarshini Panda, Arijit Raychowdhury, Kaushik Roy</i>	
Concurrent Policy Blending and System Identification for Generalized Assistive Control .....	7499
<i>Luke Bhan, Marcos Quinones-Grueiro, Gautam Biswas</i>	
ASHA: Assistive Teleoperation Via Human-In-The-Loop Reinforcement Learning .....	7505
<i>Sean Chen, Jensen Gao, Siddharth Reddy, Glen Berseth, Anca D. Dragan, Sergey Levine</i>	
Latent Imagination Facilitates Zero-Shot Transfer in Autonomous Racing.....	7513
<i>Axel Brunnbauer, Luigi Berducci, Andreas Brandstätter, Mathias Lechner, Ramin Hasani, Daniela Rus, Radu Grosu</i>	
Graph-Based Cluttered Scene Generation and Interactive Exploration Using Deep Reinforcement Learning .....	7521
<i>K. Niranjan Kumar, Irfan Essa, Sehoon Ha</i>	
Validate on Sim, Detect on Real - Model Selection for Domain Randomization .....	7528
<i>Gal Leibovich, Guy Jacob, Shadi Endrawis, Gal Novik, Aviv Tamar</i>	
Promoting Quality and Diversity in Population-Based Reinforcement Learning Via Hierarchical Trajectory Space Exploration.....	7544
<i>Jiayu Miao, Tianze Zhou, Kun Shao, Ming Zhou, Weinan Zhang, Jianye Hao, Yong Yu, Jun Wang</i>	

EDPLVO: Efficient Direct Point-Line Visual Odometry .....	7559
<i>Lipu Zhou, Guoquan Huang, Yinian Mao, Shengze Wang, Michael Kaess</i>	
Incremental Abstraction in Distributed Probabilistic SLAM Graphs .....	7566
<i>Joseph Ortiz, Talfan Evans, Edgar Sucar, Andrew J. Davison</i>	
Interval-Based Visual-Inertial LiDAR SLAM with Anchoring Poses .....	7589
<i>Aaronkumar Ehambram, Raphael Voges, Claus Brenner, Bernardo Wagner</i>	
Self-Supervised Ego-Motion Estimation Based on Multi-Layer Fusion of RGB and Inferred Depth .....	7605
<i>Zijie Jiang, Hajime Taira, Naoyuki Miyashita, Masatoshi Okutomi</i>	
HD Ground - A Database for Ground Texture Based Localization.....	7628
<i>Jan Fabian Schmid, Stephan F. Simon, Raaghav Radhakrishnan, Simone Frintrop, Rudolf Mester</i>	
The Visual-Inertial- Dynamical Multirotor Dataset .....	7635
<i>Kunyi Zhang, Tiankai Yang, Ziming Ding, Sheng Yang, Teng Ma, Mingyang Li, Chao Xu, Fei Gao</i>	
Design and Analysis of a Long-Range Magnetic Actuated and Guided Endoscope for Uniport VATS .....	7650
<i>Jixiu Li, Tao Zhang, Truman Cheng, Yehui Li, Heng Zhang, Yisen Huang, Calvin Sze Hang Ng, Philip Wai Yan Chiu, Zheng Li</i>	
On a New 10-Millimeter Surgical Robot Wrist.....	7657
<i>Mark E. Rosheim</i>	
3D Perception Based Imitation Learning Under Limited Demonstration for Laparoscope Control in Robotic Surgery.....	7664
<i>Bin Li, Ruofeng Wei, Jiaqi Xu, Bo Lu, Chi Hang Yee, Chi Fai Ng, Pheng-Ann Heng, Qi Dou, Yun-Hui Liu</i>	
Safe Endoscope Holding in Minimally Invasive Surgery: Zero Stiffness and Adaptive Weight Compensation.....	7671
<i>Jesus Mago, François Louveau, Marie-Aude Vitrani, Guillaume Morel</i>	
Human-Robot Shared Control for Surgical Robot Based on Context-Aware Sim-To-Real Adaptation .....	7694
<i>Dandan Zhang, Zicong Wu, Junhong Chen, Ruiqi Zhu, Adnan Munawar, Bo Xiao, Yuan Guan, Hang Su, Wuzhou Hong, Yao Guo, Gregory S. Fischer, Benny Lo, Guang-Zhong Yang</i>	
ColibriDoc: An Eye-In-Hand Autonomous Trocar Docking System.....	7717
<i>Shervin Dehghani, Michael Sommersperger, Junjie Yang, Mehrdad Salehi, Benjamin Busam, Kai Huang, Peter Gehlbach, Iulian Iordachita, Nassir Navab, M. Ali Nasseri</i>	
Deep Curiosity Driven Multicamera 3D Viewpoint Adjustment for Robot-Assisted Minimally Invasive Surgery .....	7724
<i>Yun-Hsuan Su, Heidi Zhang, Wenfan Jiang, Khanh Ngo, Kevin Huang</i>	
Automated Linear and Non-Linear Path Planning for Neurosurgical Interventions .....	7731
<i>Steffen Peikert, Christian Kunz, Nikola Fischer, Michal Hlavác, Andrej Pala, Max Schneider, Franziska Mathis-Ullrich</i>	
ComOpT: Combination and Optimization for Testing Autonomous Driving Systems.....	7738
<i>Changwen Li, Chih-Hong Cheng, Tiantian Sun, Yuhang Chen, Rongjie Yan</i>	

Learning Interactive Driving Policies Via Data-Driven Simulation.....	7745
<i>Tsun-Hsuan Wang, Alexander Amini, Wilko Schwarting, Igor Gilitschenski, Sertac Karaman, Daniela Rus</i>	
Deep Drifting: Autonomous Drifting of Arbitrary Trajectories Using Deep Reinforcement Learning.....	7753
<i>Fabian Domberg, Carlos Castelar Wemmers, Hiren Patel, Georg Schildbach</i>	
Perception-Friendly Video Enhancement for Autonomous Driving Under Adverse Weather Conditions .....	7760
<i>Younkwan Lee, Yeongmin Ko, Yechan Kim, Moongu Jeon</i>	
Fast Point Clouds Upsampling with Uncertainty Quantification for Autonomous Vehicles.....	7776
<i>Younghwa Jung, Seung-Woo Seo, Seong-Woo Kim</i>	
CRAT-Pred: Vehicle Trajectory Prediction with Crystal Graph Convolutional Neural Networks and Multi-Head Self-Attention.....	7799
<i>Julian Schmidt, Julian Jordan, Franz Gritschneider, Klaus Dietmayer</i>	
Causal-Based Time Series Domain Generalization for Vehicle Intention Prediction .....	7806
<i>Yeping Hu, Xiaogang Jia, Masayoshi Tomizuka, Wei Zhan</i>	
MultiPath++: Efficient Information Fusion and Trajectory Aggregation for Behavior Prediction .....	7814
<i>Balakrishnan Varadarajan, Ahmed Hefny, Avikalp Srivastava, Khaled S. Refaat, Nigamaa Nayakanti, Andre Cornman, Kan Chen, Bertrand Douillard, Chi Pang Lam, Dragomir Anguelov, Benjamin Sapp</i>	
An Adaptive PID Autotuner for Multicopters with Experimental Results .....	7846
<i>John Spencer, Joonghyun Lee, Juan Augusto Paredes, Ankit Goel, Dennis Bernstein</i>	
When Being Soft Makes You Tough: A Collision-Resilient Quadcopter Inspired by Arthropods' Exoskeletons.....	7854
<i>Ricardo De Azambuja, Hassan Fouad, Yann Bouteiller, Charles Sol, Giovanni Beltrame</i>	
Star-Convex Constrained Optimization for Visibility Planning with Application to Aerial Inspection .....	7861
<i>Tianyu Liu, Qianhao Wang, Xingguang Zhong, Zhepei Wang, Chao Xu, Fu Zhang, Fei Gao</i>	
Robot Grasping Through a Joint-Initiative Supervised Autonomy Framework.....	7868
<i>Abbas Sidaoui, Naseem Daher, Daniel Asmar</i>	
Improved Task Planning Through Failure Anticipation in Human-Robot Collaboration .....	7875
<i>Silvia Izquierdo-Badiola, Gerard Canal, Carlos Rizzo, Guillem Alenyà</i>	
Adaptive Impedance Controller for Human-Robot Arbitration Based on Cooperative Differential Game Theory .....	7881
<i>Paolo Franceschi, Nicola Pedrocchi, Manuel Beschi</i>	
On-Chip Continuous Pairing, Separation and Electrofusion of Cells Using a Microdroplet.....	7917
<i>Naotomo Tottori, Sora Sadamichi, Shinya Sakuma, Tomomi Tsubouchi, Yoko Yamanishi</i>	
Robotic Cell Manipulation for Blastocyst Biopsy .....	7923
<i>Guanqiao Shan, Zhuoran Zhang, Changsheng Dai, Hang Liu, Xian Wang, Wenkun Dou, Yu Sun</i>	
Acoustic and Magnetic Hybrid Actuated Immune Cell Robot for Target and Kill Cancer Cells.....	7936
<i>Xue Bai, Wei Zhang, Yuguo Dai, Yueying Wang, Hongyan Sun, Lin Feng</i>	

Optimizing Multi-Robot Placements for Wire Arc Additive Manufacturing.....	7942
<i>Prahar M. Bhatt, Andrzej Nycz, Satyandra K. Gupta</i>	
Map-Based Visual-Inertial Localization: A Numerical Study.....	7973
<i>Patrick Geneva, Guoquan Huang</i>	
Crossview Mapping with Graph-Based Geolocalization on City-Scale Street Maps.....	7980
<i>Zhichao Ye, Chong Bao, Xinyang Liu, Hujun Bao, Zhaopeng Cui, Guofeng Zhang</i>	
DynamicFilter: An Online Dynamic Objects Removal Framework for Highly Dynamic Environments.....	7988
<i>Tingxiang Fan, Bowen Shen, Hua Chen, Wei Zhang, Jia Pan</i>	
LT-Mapper: A Modular Framework for LiDAR-Based Lifelong Mapping.....	7995
<i>Giseop Kim, Ayoung Kim</i>	
Memory-Efficient Gaussian Fitting for Depth Images in Real Time .....	8003
<i>Peter Zhi Xuan Li, Sertac Karaman, Vivienne Sze</i>	
A Single Correspondence is Enough: Robust Global Registration to Avoid Degeneracy in Urban Environments.....	8010
<i>Hyungtae Lim, Suyong Yeon, Soohyun Ryu, Yonghan Lee, Youngji Kim, Jaeseong Yun, Euigon Jung, Donghwan Lee, Hyun Myung</i>	
Panoptic Multi-TSDFs: A Flexible Representation for Online Multi-Resolution Volumetric Mapping and Long-Term Dynamic Scene Consistency .....	8018
<i>Lukas Schmid, Jeffrey Delmerico, Johannes L. Schönberger, Juan Nieto, Marc Pollefeys, Roland Siegwart, Cesar Cadena</i>	
FD-SLAM: 3-D Reconstruction Using Features and Dense Matching .....	8040
<i>Xingrui Yang, Yuhang Ming, Zhaopeng Cui, Andrew Calway</i>	
AirDOS: Dynamic SLAM Benefits from Articulated Objects.....	8047
<i>Yuheng Qiu, Chen Wang, Wenshan Wang, Mina Henein, Sebastian Scherer</i>	
DRG: A Dynamic Relation Graph for Unified Prior-Online Environment Modeling in Urban Autonomous Driving.....	8054
<i>Rowan Dempster, Mohammad Al-Sharman, Yeshu Jain, Jeffery Li, Derek Rayside, William Melek</i>	
Enhancing Flexibility and Adaptability in Conjoined Human-Robot Industrial Tasks with a Minimalist Physical Interface.....	8061
<i>Juan M. Gandarias, Pietro Balatti, Edoardo Lamon, Marta Lorenzini, Arash Ajoudani</i>	
A Novel Multimodal Human-Exoskeleton Interface Based on EEG and sEMG Activity for Rehabilitation Training.....	8076
<i>Kecheng Shi, Rui Huang, Fengjun Mu, Zhinan Peng, Ke Huang, Yizhe Qin, Xiao Yang, Hong Cheng</i>	
Predicting the Effects of Oscillator-Based Assistance on Stride-To-Stride Variability of Parkinsonian Walkers.....	8083
<i>Virginie Otlet, Renaud Ronsse</i>	
On Wearable, Lightweight, Low-Cost Human Machine Interfaces for the Intuitive Collection of Robot Grasping and Manipulation Data .....	8090
<i>Che-Ming Chang, Jayden Chapman, Ke Wang, Patrick Jarvis, Minas Liarokapis</i>	

Adaptive Semi-Supervised Intent Inference to Control a Powered Hand Orthosis for Stroke .....	8097
<i>Jingxi Xu, Cassie Meeker, Ava Chen, Lauren Winterbottom, Michaela Fraser, Sangwoo Park, Lynne M. Weber, Mitchell Miya, Dawn Nilsen, Joel Stein, Matei Ciocarlie</i>	
MyoSim: Fast and Physiologically Realistic MuJoCo Models for Musculoskeletal and Exoskeletal Studies .....	8104
<i>Huawei Wang, Vittorio Caggiano, Guillaume Durandau, Massimo Sartori, Vikash Kumar</i>	
Multimodal Hydrostatic Actuators for Wearable Robots: A Preliminary Assessment of Mass-Saving and Energy-Efficiency Opportunities .....	8112
<i>Jeff Denis, Alex Lecavalier, Jean-Sébastien Plante, Alexandre Girard</i>	
Depth Distribution Split Labeling for Rubble Recognition of Crushing Machine .....	8150
<i>Takahiro Ikeda, Satoshi Ueki, Kazuma Shinkai, Hironao Yamada</i>	
Inside LineRanger: Mechanism Design to Optimize Operation and Performances of Powerline Inspection Robot.....	8157
<i>Pierre-Luc Richard, François Morin, Marco Lepage, Philippe Hamelin, Ghislain Lambert, Alex Sartor, Camille Hébert, Nicolas Pouliot</i>	
Crawling Locomotion Enabled by a Novel Actuated Rover Chassis .....	8164
<i>Arthur Bouton, Yang Gao</i>	
Trajectory Planning for Sensors and Payloads Moving Through Mixed and Uncertain Media .....	8171
<i>Camilo Ordóñez, David Jay, Christian Hubicki</i>	
GPS-Denied Global Visual-Inertial Ground Vehicle State Estimation Via Image Registration .....	8178
<i>Yehonathan Litman, Daniel McGann, Eric Dexheimer, Michael Kaess</i>	
Experiments in Adaptive Replanning for Fast Autonomous Flight in Forests .....	8185
<i>Laura Jarín-Lipschitz, Xu Liu, Yuezhan Tao, Vijay Kumar</i>	
Active Learning for Testing and Evaluation in Field Robotics: A Case Study in Autonomous, Off-Road Navigation.....	8217
<i>Jason M. Gregory, Daniel Sahu, Eli Lancaster, Felix Sanchez, Trevor Rocks, Brian Kaukeinen, Jonathan Fink, Satyandra K. Gupta</i>	
Modelling and Control of a Variable-Length Flexible Beam on Inspection Ground Robot.....	8224
<i>Giancarlo D'Ago, Marie Lefebvre, Luca Rosario Buonocore, Fabio Ruggiero, Mario Di Castro, Vincenzo Lippiello</i>	
Confidence-Based Robot Navigation Under Sensor Occlusion with Deep Reinforcement Learning .....	8231
<i>Hyeongyeol Ryu, Minsung Yoon, Daehyung Park, Sung-Eui Yoon</i>	
Hybrid Physical Metric for 6-DoF Grasp Pose Detection .....	8238
<i>Yuhao Lu, Beixing Deng, Zhenyu Wang, Peiyuan Zhi, Yali Li, Shengjin Wang</i>	
Learning Multi-Step Robotic Manipulation Policies from Visual Observation of Scene and Q-Value Predictions of Previous Action.....	8245
<i>Sulabh Kumra, Shirin Joshi, Ferat Sahin</i>	
ReorientBot: Learning Object Reorientation for Specific-Posed Placement.....	8252
<i>Kentaro Wada, Stephen James, Andrew J. Davison</i>	
LEGS: Learning Efficient Grasp Sets for Exploratory Grasping .....	8259
<i>Letian Fu, Michael Danielczuk, Ashwin Balakrishna, Daniel S. Brown, Jeffrey Ichnowski, Eugen Solowjow, Ken Goldberg</i>	

Learning Latent Graph Dynamics for Visual Manipulation of Deformable Objects.....	8266
<i>Xiao Ma, David Hsu, Wee Sun Lee</i>	
Learning Visual Shape Control of Novel 3D Deformable Objects from Partial-View Point Clouds.....	8274
<i>Bao Thach, Brian Y. Cho, Alan Kuntz, Tucker Hermans</i>	
Real2Sim2Real: Self-Supervised Learning of Physical Single-Step Dynamic Actions for Planar Robot Casting.....	8282
<i>Vincent Lim, Huang Huang, Lawrence Yunliang Chen, Jonathan Wang, Jeffrey Ichnowski, Daniel Seita, Michael Laskey, Ken Goldberg</i>	
Cluttered Food Grasping with Adaptive Fingers and Synthetic-Data Trained Object Detection .....	8290
<i>Avinash Ummadisingu, Kuniyuki Takahashi, Naoki Fukaya</i>	
Visuotactile-RL: Learning Multimodal Manipulation Policies with Deep Reinforcement Learning.....	8298
<i>Johanna Hansen, Francois Hogan, Dmitriy Rivkin, David Meger, Michael Jenkin, Gregory Dudek</i>	
Reducing Tactile Sim2Real Domain Gaps Via Deep Texture Generation Networks.....	8305
<i>Tudor Jianu, Daniel Fernandes Gomes, Shan Luo</i>	
Grasp Pose Selection Under Region Constraints for Dirty Dish Grasps Based on Inference of Grasp Success Probability Through Self-Supervised Learning .....	8312
<i>Shumpei Wakabayashi, Shingo Kitagawa, Kento Kawaharazuka, Takayuki Murooka, Kei Okada, Masayuki Inaba</i>	
Constrained Variable Impedance Control Using Quadratic Programming.....	8319
<i>Zhehao Jin, Dongdong Qin, Andong Liu, Wen-An Zhang, Li Yu</i>	
Variable Stiffness Control Via External Torque Estimation Using LSTM .....	8325
<i>Jaesug Jung, Seungbin You, Donghyeon Kim, Jaeheung Park</i>	
Mixed Control for Whole-Body Compliance of a Humanoid Robot.....	8331
<i>Xiaozhu Ju, Jiajun Wang, Gang Han, Mingguo Zhao</i>	
A Memory-Based SO(3) Parameterization: Theory and Application to 6D Impedance Control with Radially Unbounded Potential Function.....	8338
<i>Jinyeong Jeong, Hrishik Mishra, Christian Ott, Min Jun Kim</i>	
A Model Free Robot Control Method for Dragging an Object on a Planar Surface by Applying Top Contact Forces .....	8361
<i>Savvas Sampaziotis, Zoe Doulgeri</i>	
Unfreezing Social Navigation: Dynamical Systems Based Compliance for Contact Control in Robot Navigation .....	8368
<i>Diego Paez-Granados, Vaibhav Gupta, Aude Billard</i>	
Easing Reliance on Collision-Free Planning with Contact-Aware Control.....	8375
<i>Tao Pang, Russ Tedrake</i>	
Autonomous Ultrasound Scanning Using Bayesian Optimization and Hybrid Force Control.....	8396
<i>Raghav Goel, FNU Abhimanyu, Kirtan Patel, John Galeotti, Howie Choset</i>	
Trajectory Prediction for Autonomous Driving with Topometric Map.....	8403
<i>Jiaolong Xu, Liang Xiao, Dawei Zhao, Yiming Nie, Bin Dai</i>	

See Yourself in Others: Attending Multiple Tasks for Own Failure Detection.....	8409
<i>Boyang Sun, Jiaxu Xing, Hermann Blum, Roland Siegwart, Cesar Cadena</i>	
I Know What You Draw: Learning Grasp Detection Conditioned on a Few Freehand Sketches .....	8417
<i>Haitao Lin, Chilam Cheang, Yanwei Fu, Xiangyang Xue</i>	
Implicit LiDAR Network: LiDAR Super-Resolution Via Interpolation Weight Prediction.....	8424
<i>Youngsun Kwon, Minhyuk Sung, Sung-Eui Yoon</i>	
Incremental Few-Shot Object Detection for Robotics.....	8447
<i>Yiting Li, Haiyue Zhu, Sichao Tian, Fan Feng, Jun Ma, Chek Sing Teo, Cheng Xiang, Prahlad Vadakkepat, Tong Heng Lee</i>	
CLA-NeRF: Category-Level Articulated Neural Radiance Field.....	8454
<i>Wei-Cheng Tseng, Hung-Ju Liao, Lin Yen-Chen, Min Sun</i>	
Learning to Infer Kinematic Hierarchies for Novel Object Instances .....	8461
<i>Hameed Abdul-Rashid, Miles Freeman, Ben Abbatematteo, George Konidakis, Daniel Ritchie</i>	
Self-Supervised Camera Self-Calibration from Video .....	8468
<i>Jiading Fang, Igor Vasiljevic, Vitor Guizilini, Rares Ambrus, Greg Shakhnarovich, Adrien Gaidon, Matthew R. Walter</i>	
Learning 6-DoF Object Poses to Grasp Category-Level Objects by Language Instructions.....	8476
<i>Chilam Cheang, Haitao Lin, Yanwei Fu, Xiangyang Xue</i>	
Multiple Consistency Supervision Based Semi-Supervised OCT Segmentation Using Very Limited Annotations .....	8483
<i>Ye Lu, Yutian Shen, Xiaohan Xing, Max Q.-H. Meng</i>	
Decoupling of Inertia Effect in Angular Momentum of a Humanoid and Its Application to Resolved Viscoelasticity Control.....	8490
<i>Zewen He, Ko Yamamoto</i>	
Using Eye Gaze to Forecast Human Pose in Everyday Pick and Place Actions .....	8497
<i>Haziq Razali, Yiannis Demiris</i>	
On the Reliability of Inverse Optimal Control .....	8504
<i>Jessica Colombel, David Daney, François Charpillet</i>	
DanceHAT: Generate Stable Dances for Humanoid Robots with Adversarial Training.....	8511
<i>Buqing Nie, Yue Gao</i>	
Design and Development for Humanoid-Vehicle Transformer Platform with Plastic Resin Structure and Distributed Redundant Sensors.....	8526
<i>Tasuku Makabe, Naoki Hiraoka, Shintaro Noda, Tomoki Anzai, Kohei Kimura, Mirai Hattori, Hiroya Sato, Fumihito Sugai, Yohei Kakiuchi, Kei Okada, Masayuki Inaba</i>	
A Robotic Lower Limb with Eight DoFs and Whole-Foot Tactile Perception for Anthropomorphic Behavior Performance* .....	8533
<i>Funing Hou, Jixiao Liu, Kuo Liu, Dicai Chen, Shijie Guo</i>	
Introducing RH5 Manus: A Powerful Humanoid Upper Body Design for Dynamic Movements .....	8540
<i>Melya Boukheddimi, Shivesh Kumar, Heiner Peters, Dennis Mronga, Rohan Budhiraja, Frank Kirchner</i>	

Design and Control of a Miniature Bipedal Robot with Proprioceptive Actuation for Dynamic Behaviors.....	8547
<i>Yeting Liu, Junjie Shen, Jingwen Zhang, Xiaoguang Zhang, Taoyuanmin Zhu, Dennis Hong</i>	
Human Navigational Intent Inference with Probabilistic and Optimal Approaches.....	8562
<i>Pedram Agand, Mahdi Taherahmadi, Angelica Lim, Mo Chen</i>	
Watch and Learn: Learning to Control Feedback Linearizable Systems from Expert Demonstrations .....	8577
<i>Alimzhan Sultangazin, Luigi Pannocchi, Lucas Fraile, Paulo Tabuada</i>	
Attentive One-Shot Meta-Imitation Learning from Visual Demonstration.....	8584
<i>Vishal Bhutani, Anima Majumder, Madhu Vankadari, Samrat Dutta, Aaditya Asati, Swagat Kumar</i>	
Learning Sensorimotor Primitives of Sequential Manipulation Tasks from Visual Demonstrations .....	8591
<i>Junchi Liang, Bowen Wen, Kostas Bekris, Abdeslam Boularias</i>	
Maximum Likelihood Constraint Inference on Continuous State Spaces .....	8598
<i>Kaylene C. Stocking, D. Livingston McPherson, Robert P. Matthew, Claire J. Tomlin</i>	
Learning Stable Dynamical Systems for Visual Servoing.....	8636
<i>Antonio Paolillo, Matteo Saveriano</i>	
Robot Skill Adaptation Via Soft Actor-Critic Gaussian Mixture Models .....	8651
<i>Iman Nematollahi, Erick Rosete-Beas, Adrian Röfer, Tim Welschehold, Abhinav Valada, Wolfram Burgard</i>	
Learning Periodic Tasks from Human Demonstrations.....	8658
<i>Jingyun Yang, Junwu Zhang, Connor Settle, Akshara Rai, Rika Antonova, Jeannette Bohg</i>	
Abnormal Occupancy Grid Map Recognition Using Attention Network.....	8666
<i>Fuqin Deng, Hua Feng, Mingjian Liang, Qi Feng, Ningbo Yi, Yong Yang, Yuan Gao, Junfeng Chen, Tin Lun Lam</i>	
Uncertainty from Motion for DNN Monocular Depth Estimation .....	8673
<i>Sounya Sudhakar, Vivienne Sze, Sertac Karaman</i>	
Depth Completion Using Geometry-Aware Embedding.....	8680
<i>Wenchao Du, Hu Chen, Hongyu Yang, Yi Zhang</i>	
Prediction of Depth Camera Missing Measurements Using Deep Learning for Next Best View Planning.....	8711
<i>Riccardo Monica, Jacopo Aleotti</i>	
Message Passing Framework for Vision Prediction Stability in Human Robot Interaction.....	8726
<i>Youngkyoon Jang, Yiannis Demiris</i>	
Unsupervised Depth Completion and Denoising for RGB-D Sensors .....	8734
<i>Lei Fan, Yunxuan Li, Chen Jiang, Ying Wu</i>	
PA-AWCNN: Two-Stream Parallel Attention Adaptive Weight Network for RGB-D Action Recognition .....	8741
<i>Lu Yao, Sheng Liu, Chaonan Li, Siyu Zou, Shengyong Chen, Diyi Guan</i>	
Variable Rate Compression for Raw 3D Point Clouds.....	8748
<i>Md Ahmed Al Muzaddid, William J. Beksi</i>	



Stable and Efficient Shapley Value-Based Reward Reallocation for Multi-Agent Reinforcement Learning of Autonomous Vehicles.....	8765
<i>Songyang Han, He Wang, Sanbao Su, Yuanyuan Shi, Fei Miao</i>	
A Framework for Real-World Multi-Robot Systems Running Decentralized GNN-Based Policies .....	8772
<i>Jan Blumenkamp, Steven Morad, Jennifer Gielis, Qingbiao Li, Amanda Prorok</i>	
Coverage Control in Multi-Robot Systems Via Graph Neural Networks .....	8787
<i>Walker Gosrich, Siddharth Mayya, Rebecca Li, James Paulos, Mark Yim, Alejandro Ribeiro, Vijay Kumar</i>	
Multi-Target Encirclement with Collision Avoidance Via Deep Reinforcement Learning Using Relational Graphs .....	8794
<i>Tianle Zhang, Zhen Liu, Zhiqiang Pu, Jianqiang Yi</i>	
Decentralized Global Connectivity Maintenance for Multi-Robot Navigation: A Reinforcement Learning Approach.....	8801
<i>Minghao Li, Yingrui Jie, Yang Kong, Hui Cheng</i>	
Multi-Robot Cooperative Pursuit Via Potential Field-Enhanced Reinforcement Learning.....	8808
<i>Zheng Zhang, Xiaohan Wang, Qingrui Zhang, Tianjiang Hu</i>	
Learning Scalable Policies Over Graphs for Multi-Robot Task Allocation Using Capsule Attention Networks .....	8815
<i>Steve Paull, Payam Ghassemi, Souma Chowdhury</i>	
Task Allocation with Load Management in Multi-Agent Teams .....	8823
<i>Haochen Wu, Amin Ghadami, Alparslan Emrah Bayrak, Jonathon M. Smereka, Bogdan I. Epureanu</i>	
The ThreeDWorld Transport Challenge: A Visually Guided Task-And-Motion Planning Benchmark Towards Physically Realistic Embodied AI.....	8847
<i>Chuang Gan, Siyuan Zhou, Jeremy Schwartz, Seth Alter, Abhishek Bhandwaldar, Dan Gutfreund, Daniel L. K. Yamins, James J. Dicarlo, Josh McDermott, Antonio Torralba, Joshua B. Tenenbaum</i>	
Online Adaptive Identification and Switching of Soft Contact Model Based on ART-II Method.....	8855
<i>Yi Liu, Di Wu, Fengtao Han, Jing Guo, Zhaoshui He, Chao Liu</i>	
A Proprioceptive Haptic Device Design for Teaching Bimanual Manipulation .....	8862
<i>Choongin Lee, Taeyoon Lee, Jae-Kyung Min, Albert Wang, Sungpyo Lee, Jaesung Oh, Chang-Woo Park, Keunjun Choi</i>	
A Wearable Fingertip Cutaneous Haptic Device with Continuous Omnidirectional Motion Feedback.....	8869
<i>Peizhi Zhang, Mitsuhiro Kamezaki, Yutaro Hattori, Shigeki Sugano</i>	
Rendering Virtual Inertia in Haptic Interfaces: Analysis and Limitations .....	8876
<i>Jorge Juan Gil, Axier Ugartemendia, Iñaki Díaz</i>	
Interactive Robotic Grasping with Attribute-Guided Disambiguation .....	8914
<i>Yang Yang, Xibai Lou, Changhyun Choi</i>	
Autonomous Exploration Development Environment and the Planning Algorithms.....	8921
<i>Chao Cao, Hongbiao Zhu, Fan Yang, Yukun Xia, Howie Choset, Jean Oh, Ji Zhang</i>	

Event-Triggered Tracking Control Scheme for Quadrotors with External Disturbances: Theory and Validations.....	8929
<i>Pengcheng Gao, Gang Wang, Yunfeng Ji, Qingdu Li, Jianwei Zhang, Yantao Shen, Peng Li</i>	
PredictionNet: Real-Time Joint Probabilistic Traffic Prediction for Planning, Control, and Simulation .....	8936
<i>Alexey Kamenev, Lirui Wang, Ollin Boer Bohan, Ishwar Kulkarni, Bilal Kartal, Artem Molchanov, Stan Birchfield, David Nistér, Nikolai Smolyanskiy</i>	
Graph Neural Network Based Relation Learning for Abnormal Perception Information Detection in Self-Driving Scenarios .....	8943
<i>Kefan Jin, Hongye Wang, Changxing Liu, Yu Zhai, Ling Tang</i>	
Domain Generalization for Vision-Based Driving Trajectory Generation .....	8950
<i>Yunkai Wang, Dongkun Zhang, Yuxiang Cui, Zexi Chen, Wei Jing, Junbo Chen, Rong Xiong, Yue Wang</i>	
StopNet: Scalable Trajectory and Occupancy Prediction for Urban Autonomous Driving .....	8957
<i>Jinkyu Kim, Reza Mahjourian, Scott Ettinger, Mayank Bansal, Brandyn White, Ben Sapp, Dragomir Anguelov</i>	
FusionNet: Coarse-To-Fine Extrinsic Calibration Network of LiDAR and Camera with Hierarchical Point-Pixel Fusion.....	8964
<i>Guangming Wang, Jiahao Qiu, Yanfeng Guo, Hesheng Wang</i>	
Cyclops: Open Platform for Scale Truck Platooning .....	8971
<i>Hyeongyu Lee, Jaegeun Park, Changjin Koo, Jong-Chan Kim, Yongsoon Eun</i>	
Runtime Safety Assurance for Learning-Enabled Control of Autonomous Driving Vehicles .....	8978
<i>Shengduo Chen, Yaowei Sun, Dachuan Li, Qiang Wang, Qi Hao, Joseph Sifakis</i>	
Looking for Trouble: Informative Planning for Safe Trajectories with Occlusions .....	8985
<i>Barry Gilhuly, Armin Sadeghi, Peyman Yedemellat, Kasra Rezaee, Stephen L. Smith</i>	
A Deep Concept Graph Network for Interaction-Aware Trajectory Prediction.....	8992
<i>Yutong Ban, Xiao Li, Guy Rosman, Igor Gilitschenski, Ozanan Meireles, Sertac Karaman, Daniela Rus</i>	
Real-Time Trajectory Planning for Autonomous Driving with Gaussian Process and Incremental Refinement .....	8999
<i>Jie Cheng, Yingbing Chen, Qingwen Zhang, Lu Gan, Chengju Liu, Ming Liu</i>	
Scalable Gradient Ascent for Controllers in Constrained POMDPs.....	9085
<i>Kyle Hollins Wray, Kenneth Czuprynski</i>	
A Model Predictive-Based Motion Planning Method for Safe and Agile Traversal of Unknown and Occluding Environments .....	9092
<i>Jacob Higgins, Nicola Bezzo</i>	
GOHOME: Graph-Oriented Heatmap Output for Future Motion Estimation .....	9107
<i>Thomas Gilles, Stefano Sabatini, Dzmityr Tsishkou, Bogdan Stanciulescu, Fabien Moutarde</i>	
Translating Images into Maps .....	9200
<i>Avishkar Saha, Oscar Mendez, Chris Russell, Richard Bowden</i>	
SMAC-Seg: LiDAR Panoptic Segmentation Via Sparse Multi-Directional Attention Clustering.....	9207
<i>Enxu Li, Ryan Razani, Yixuan Xu, Bingbing Liu</i>	

Superpoint-Guided Semi-Supervised Semantic Segmentation of 3D Point Clouds .....	9214
<i>Shuang Deng, Qiulei Dong, Bo Liu, Zhanyi Hu</i>	
Efficient and Robust Semantic Mapping for Indoor Environments .....	9221
<i>Daniel Seichter, Patrick Langer, Tim Wengefeld, Benjamin Lewandowski, Dominik Höchemer, Horst-Michael Gross</i>	
Towards Broad Learning Networks on Unmanned Mobile Robot for Semantic Segmentation.....	9228
<i>Jiehao Li, Yingpeng Dai, Junzheng Wang, Xiaohang Su, Ruijun Ma</i>	
Vision-Based Large-Scale 3D Semantic Mapping for Autonomous Driving Applications .....	9235
<i>Qing Cheng, Niclas Zeller, Daniel Cremers</i>	
Prototype-Voxel Contrastive Learning for LiDAR Point Cloud Panoptic Segmentation .....	9243
<i>Minzhe Liu, Qiang Zhou, Hengshuang Zhao, Jianing Li, Yuan Du, Kurt Keutzer, Li Du, Shanghang Zhang</i>	
Perception Engine Using a Multi-Sensor Head to Enable High-Level Humanoid Robot Behaviors .....	9251
<i>Bhavayansh Mishra, Duncan Calvert, Brendon Ortolano, Max Asselmeier, Luke Fina, Stephen McCrory, Hakki Erhan Sevil, Robert Griffin</i>	
Audio-Visual Grounding Referring Expression for Robotic Manipulation.....	9258
<i>Yefei Wang, Kaili Wang, Yi Wang, Di Guo, Huaping Liu, Fuchun Sun</i>	
TridentNetV2: Lightweight Graphical Global Plan Representations for Dynamic Trajectory Generation .....	9265
<i>David Paz, Hao Xiang, Andrew Liang, Henrik I. Christensen</i>	
Hierarchical Representations and Explicit Memory: Learning Effective Navigation Policies on 3D Scene Graphs Using Graph Neural Networks .....	9272
<i>Zachary Ravichandran, Lisa Peng, Nathan Hughes, J. Daniel Griffith, Luca Carlone</i>	
Tactile Classification of Object Materials for Virtual Reality Based Robot Teleoperation .....	9288
<i>Bukeikhan Omarali, Francesca Palermo, Kaspar Althoefer, Maurizio Valle, Ildar Farkhatdinov</i>	
Semi-Autonomous Teleoperation Via Learning Non-Prehensile Manipulation Skills.....	9295
<i>Sangbeom Park, Yoonbyung Chai, Sunghyun Park, Jeongeun Park, Kyungjae Lee, Sungjoon Choi</i>	
Towards 6DoF Bilateral Teleoperation of an Omnidirectional Aerial Vehicle for Aerial Physical Interaction.....	9302
<i>Mike Allenspach, Nicholas Lawrance, Marco Tognon, Roland Siegwart</i>	
Comparison of Haptic and Augmented Reality Visual Cues for Assisting Tele- Manipulation .....	9309
<i>Tsung-Chi Lin, Achyuthan Unni Krishnan, Zhi Li</i>	
Immersive Virtual Walking System Using an Avatar Robot.....	9325
<i>Kengkij Promsutipong, Jose V. Salazar Lucas, Ankit A. Ravankar, Seyed Amir Tafrishi, Yasuhisa Hirata</i>	
Blending Primitive Policies in Shared Control for Assisted Teleoperation.....	9332
<i>Guilherme Maeda</i>	
Maximal Manipulation Framework Using Quadratic Programming for a Teleoperated Robotic System with Articulated Bodies .....	9339
<i>Donghyeon Lee, Dongwoo Ko, Wan Kyun Chung, Keehoon Kim</i>	

Augmenting Imitation Experience Via Equivariant Representations .....	9383
<i>Dhruv Sharma, Alihusein Kuwajerwala, Florian Shkurti</i>	
Depth-Aware Vision-And-Language Navigation Using Scene Query Attention Network .....	9390
<i>Sinan Tan, Mengmeng Ge, Di Guo, Huaping Liu, Fuchun Sun</i>	
Visual Navigation Using Sparse Optical Flow and Time-To-Transit.....	9397
<i>Chiara Boretti, Philippe Bich, Yanyu Zhang, John Baillieul</i>	
Indoor Localization for Quadrotors Using Invisible Projected Tags.....	9404
<i>Jinjie Li, Liang Han, Zhang Ren</i>	
Complex Terrain Navigation Via Model Error Prediction .....	9411
<i>Adam Polevoy, Craig Knuth, Katie M. Popek, Kapil D. Katyal</i>	
An Observer Cascade for Velocity and Multiple Line Estimation .....	9418
<i>André Mateus, Pedro U. Lima, Pedro Miraldo</i>	
An In-Depth Experimental Study of Sensor Usage and Visual Reasoning of Robots Navigating in Real Environments .....	9425
<i>Assem Sadek, Guillaume Bono, Boris Chidlovskii, Christian Wolf</i>	
Asynchronous Optimisation for Event-Based Visual Odometry.....	9432
<i>Daqi Liu, Alvaro Parra, Yasir Latif, Bo Chen, Tat-Jun Chin, Ian Reid</i>	
Deep Visual Navigation Under Partial Observability.....	9439
<i>Bo Ai, Wei Gao, Vinay, David Hsu</i>	
TERP: Reliable Planning in Uneven Outdoor Environments Using Deep Reinforcement Learning .....	9447
<i>Kasun Weerakoon, Adarsh Jagan Sathyamoorthy, Utsav Patel, Dinesh Manocha</i>	
Integrating Point and Line Features for Visual-Inertial Initialization.....	9470
<i>Hong Liu, Junyin Qiu, Weibo Huang</i>	
Periodic SLAM: Using Cyclic Constraints to Improve the Performance of Visual-Inertial SLAM on Legged Robots.....	9477
<i>Hans Kumar, J. Joe Payne, Matthew Travers, Aaron M. Johnson, Howie Choset</i>	
Tightly-Coupled GNSS-Aided Visual-Inertial Localization .....	9484
<i>Woosik Lee, Patrick Geneva, Yulin Yang, Guoquan Huang</i>	
Continuous-Time Spline Visual-Inertial Odometry .....	9492
<i>Jiawei Mo, Junaed Sattar</i>	
Object-Based Visual-Inertial Navigation System on Matrix Lie Group.....	9499
<i>Jae Hyung Jung, Chan Gook Park</i>	
FEJ2: A Consistent Visual-Inertial State Estimator Design .....	9506
<i>Chuchu Chen, Yulin Yang, Patrick Geneva, Guoquan Huang</i>	
Constrained Visual-Inertial Localization with Application and Benchmark in Laparoscopic Surgery .....	9513
<i>Regine Hartwig, Daniel Ostler, Jean-Claude Rosenthal, Hubertus Feußner, Dirk Wilhelm, Dirk Wollherr</i>	
Bidirectional Soft Robotic Catheter for Arrhythmia Treatment.....	9579
<i>Chi Cong Nguyen, Timotius Teh, Mai Thanh Thai, Phuoc Thien Phan, Trung Thien Hoang, Harrison Low, James Davies, Emanuele Nicotra, Nigel H. Lovell, Thanh Nho Do</i>	

Magnetically Steerable Asymmetric Magnetized Soft Continuum Robot (AMSCR) for Minimally Invasive Surgery .....	9586
<i>Joowon Park, Hyoryong Lee, Hyunchul Choi, Sunwoo Sohn, Hyeonwoo Kee, Joohack Lee, Gyungrae Cha, Sukho Park</i>	
Fixed and Sliding FBG Sensors-Based Triaxial Tip Force Sensing for Cable-Driven Continuum Robots.....	9593
<i>Zecai Lin, Huanghua Liu, Xiaojie Ai, Weidong Chen, Anzhu Gao, Zhenglong Sun, Yun Zou, Guang-Zhong Yang, Hao Wu, Huan Jia</i>	
Telerobotically Controlled Magnetic Soft Continuum Robots for Neurovascular Interventions .....	9600
<i>Yoonho Kim, Emily Genevriere, Pablo Harker, Jaehun Choe, Marcin Balicki, Aman B. Patel, Xuanhe Zhao</i>	
Design and Quasistatic Modelling of Hybrid Continuum Multi-Arm Robots.....	9607
<i>Zisos Mitros, S. M. Hadi Sadati, Sotirios Nousias, Lyndon Da Cruz, Christos Bergeles</i>	
Capacitive Proximity Sensor for Non-Contact Endoscope Localization.....	9614
<i>Christian Marzi, Hosam Alagi, Olivia Rau, Jochen Hampe, Jan Gerrit Korvink, Björn Hein, Franziska Mathis-Ullrich</i>	
Learning to Localize, Grasp, and Hand Over Unmodified Surgical Needles .....	9637
<i>Albert Wilcox, Justin Kerr, Brijen Thananjeyan, Jeffrey Ichnowski, Minh Hwang, Samuel Paradis, Danyal Fer, Ken Goldberg</i>	
Resolution-Optimal Motion Planning for Steerable Needles .....	9652
<i>Mengyu Fu, Kiril Solovey, Oren Salzman, Ron Alterovitz</i>	
Motion Primitives-Based Navigation Planning Using Deep Collision Prediction .....	9660
<i>Huan Nguyen, Sondre Holm Fyhn, Paolo De Petris, Kostas Alexis</i>	
Optimizing Terrain Mapping and Landing Site Detection for Autonomous UAVs.....	9668
<i>Pedro F. Proença, Jeff Delaune, Rol, Brockers</i>	
Towards Sensor Autonomy in Sub-Gram Flying Insect Robots: A Lightweight and Power-Efficient Avionics System.....	9675
<i>Yash P. Talwekar, Andrew Adie, Vikram Iyer, Sawyer B. Fuller</i>	
Exploration with Global Consistency Using Real-Time Re-Integration and Active Loop Closure .....	9682
<i>Yichen Zhang, Boyu Zhou, Luqi Wang, Shaojie Shen</i>	
Self-Supervised Monocular Multi-Robot Relative Localization with Efficient Deep Neural Networks .....	9689
<i>Shushuai Li, Christophe De Wagter, Guido C. H. E. De Croon</i>	
Post-Stall Navigation with Fixed-Wing UAVs Using Onboard Vision .....	9696
<i>Adam Polevoy, Max Basescu, Luca Scheuer, Joseph Moore</i>	
Evaluation of Runtime Monitoring for UAV Emergency Landing .....	9703
<i>Joris Guerin, Kevin Delmas, Jérémie Guiochet</i>	
Fully Automatic and Real-Time Microrobot Detection and Tracking Based on Ultrasound Imaging Using Deep Learning.....	9763
<i>Karim Botros, Mohammad Alkhatib, David Folio, Antoine Ferreira</i>	
The Feedback Trajectory Control of a SMA-Driven Miniature Jumping Robot.....	9769
<i>Lingqi Tang, Xuelin Wu, Peng Liu, Yao Li, Bing Li</i>	

An Indeterministic Vision-Based State Observer for Growing Magnetic Microrobot Motion Status Estimation.....	9776
<i>Zhiyong Sun, Yu Cheng, Chao Zhou, Erkang Cheng, Gengliang Chen, Lixin Dong, Bo Song</i>	
A Beetle-Claw Inspired Miniature Mesh Climbing Robot.....	9783
<i>Hong Wang, Yao Li, Bing Li</i>	
Fabrication of PEDOT:PSS Based Soft Sensor for Feedback Control of Modular Bio-Actuator .....	9790
<i>Eunhye Kim, Masaru Takeuchi, Takuto Nomura, Yasuhisa Hasegawa, Qiang Huang, Toshio Fukuda</i>	
Data-Driven Control for a Milli-Scale Spiral-Type Magnetic Swimmer Using MPC .....	9823
<i>Haoran Zhao, Yitong Lu, Aaron T. Becker, Julien Leclerc</i>	
Characterizing Error in Noncommutative Geometric Gait Analysis .....	9845
<i>Caprin Bass, Suresh Ramasamy, Ross L. Hatton</i>	
Adaptive Tracking Control for Industrial Robot Manipulators with Unknown Inner Loop Architecture* .....	9860
<i>Joseph Jean-Baptiste Mvogo Ahanda, Achille Melingui, Othman Lakhali, Bernard Essimbi Zobo, Hela Kadri, Rochdi Merzouki</i>	
Model-Driven Reinforcement Learning and Action Dimension Extension Method for Efficient Asymmetric Assembly .....	9867
<i>Yuhang Gai, Jiuming Guo, Dan Wu, Ken Chen</i>	
Automatic Classification and Disassembly of Fasteners in Industrial 3D CAD-Scenarios.....	9874
<i>Michele F. Adesso, Robert Hegewald, Nicola Wolpert, Elmar Schömer, Bianca Maier, Benjamin A. Epple</i>	
Learning Insertion Primitives with Discrete-Continuous Hybrid Action Space for Robotic Assembly Tasks.....	9881
<i>Xiang Zhang, Shiyu Jin, Changhao Wang, Xinghao Zhu, Masayoshi Tomizuka</i>	
An Assembly Sequence Planning Framework for Complex Data Using General Voronoi Diagram.....	9896
<i>Sebastian Dorn, Nicola Wolpert, Elmar Schömer</i>	
Improving Standing Balance Performance Through the Assistance of a Mobile Collaborative Robot.....	10017
<i>Francisco J. Ruiz-Ruiz, Alberto Giammarino, Marta Lorenzini, Juan M. Gandarias, Jesús H. Gómez-De-Gabriel, Arash Ajoudani</i>	
Aerial-Ground Robots Collaborative 3D Mapping in GNSS-Denied Environments .....	10041
<i>Yufeng Yue, Chunyang Zhao, Yuanzhe Wang, Yi Yang, Danwei Wang</i>	
Graph-Based Multi-Sensor Fusion for Consistent Localization of Autonomous Construction Robots .....	10048
<i>Julian Nubert, Shehryar Khattak, Marco Hutter</i>	
R-PCC: A Baseline for Range Image-Based Point Cloud Compression .....	10055
<i>Sukai Wang, Jianhao Jiao, Peide Cai, Lujia Wang</i>	
Consensus in Operational Space for Robotic Manipulators with Task and Input Constraints .....	10148
<i>Muhammad Ali Murtaza, Seth Hutchinson</i>	
SafePicking: Learning Safe Object Extraction Via Object-Level Mapping .....	10202
<i>Kentaro Wada, Stephen James, Andrew J. Davison</i>	

Active Extrinsic Contact Sensing: Application to General Peg-In-Hole Insertion .....	10241
<i>Sangwoon Kim, Alberto Rodriguez</i>	
Pouring by Feel: An Analysis of Tactile and Proprioceptive Sensing for Accurate Pouring .....	10248
<i>Pedro Piacenza, Daewon Lee, Volkan Isler</i>	
Robot Learning Physical Object Properties from Human Visual Cues: A Novel Approach to Infer the Fullness Level in Containers .....	10375
<i>Nuno Ferreira Duarte, Mirko Rakovic, José Santos-Victor</i>	
Ex-DoF: Expansion of Action Degree-Of-Freedom with Virtual Camera Rotation for Omnidirectional Image .....	10382
<i>Kosuke Tahara, Noriaki Hirose</i>	
Development and Analysis of a Biped Robot with Prismatic Compliance .....	10398
<i>Takumi Kamioka, Hirofumi Shin, Ryo Yamaguchi, Masaaki Muromachi</i>	
Learning Controller Gains on Bipedal Walking Robots Via User Preferences .....	10405
<i>Noel Csomay-Shanklin, Maegan Tucker, Min Dai, Jenna Reher, Aaron D. Ames</i>	
Online Non-Linear Centroidal MPC for Humanoid Robot Locomotion with Step Adjustment .....	10412
<i>Giulio Romualdi, Stefano Dafarra, Giuseppe L'Erario, Ines Sorrentino, Silvio Traversaro, Daniele Pucci</i>	
A Universal Footstep Planning Methodology for Continuous Walking in Challenging Terrain Applicable to Different Types of Legged Robots.....	10420
<i>Alexander Stumpf, Oskar Von Stryk</i>	
Sim-To-Real Learning of Footstep-Constrained Bipedal Dynamic Walking.....	10428
<i>Helei Duan, Ashish Malik, Jeremy Dao, Aseem Saxena, Kevin Green, Jonah Siekmann, Alan Fern, Jonathan Hurst</i>	
Bipedal Walking on Constrained Footholds: Momentum Regulation Via Vertical COM Control .....	10435
<i>Min Dai, Xiaobin Xiong, Aaron Ames</i>	
Online Learning of Centroidal Angular Momentum Towards Enhancing DCM-Based Locomotion.....	10442
<i>Robert Schuller, George Mesesan, Johannes Engelsberger, Jinh Lee, Christian Ott</i>	
Sim-To-Real Learning for Bipedal Locomotion Under Unsensed Dynamic Loads.....	10449
<i>Jeremy Dao, Kevin Green, Helei Duan, Alan Fern, Jonathan Hurst</i>	
Bayesian Optimization Meets Hybrid Zero Dynamics: Safe Parameter Learning for Bipedal Locomotion Control .....	10456
<i>Lizhi Yang, Zhongyu Li, Jun Zeng, Koushil Sreenath</i>	
A Benchmark Comparison of Learned Control Policies for Agile Quadrotor Flight.....	10504
<i>Elia Kaufmann, Leonard Bauersfeld, Davide Scaramuzza</i>	
OSCAR: Data-Driven Operational Space Control for Adaptive and Robust Robot Manipulation .....	10519
<i>Josiah Wong, Viktor Makoviychuk, Anima Anandkumar, Yuke Zhu</i>	
Kinematics Learning of Massive Heterogeneous Serial Robots.....	10535
<i>Dengpeng Xing, Wannian Xia, Bo Xu</i>	
Integrating Deep Reinforcement and Supervised Learning to Expedite Indoor Mapping.....	10542
<i>Elchanan Zwecher, Eran Iceland, Sean R. Levy, Shmuel Y. Hayoun, Oren Gal, Ariel Barel</i>	

Learning to Optimize in Model Predictive Control .....	10549
<i>Jacob Sacks, Byron Boots</i>	
GPU-Accelerated Policy Optimization Via Batch Automatic Differentiation of Gaussian Processes for Real-World Control .....	10557
<i>Abdolreza Taheri, Joni Pajarinen, Reza Ghabcheloo</i>	
Next Steps: Learning a Disentangled Gait Representation for Versatile Quadruped Locomotion .....	10564
<i>Alexander L. Mitchell, Wolfgang Merkt, Mathieu Geisert, Siddhant Gangapurwala, Martin Engelcke, Oiwi Parker Jones, Ioannis Havoutis, Ingmar Posner</i>	
Targeted Attack on Deep RL-Based Autonomous Driving with Learned Visual Patterns .....	10571
<i>Prasanth Buddareddygar, Travis Zhang, Yezhou Yang, Yi Ren</i>	
Forward Models that Integrate High-Dimensional and Localized Sensing of Peripheral Muscle Behavior Enable Task-Independent Prediction of Lower-Limb Joint Torque and Position Future States .....	10578
<i>Kaitlin G. Rabe, Nicholas P. Fey</i>	
TP-AE: Temporally Primed 6D Object Pose Tracking with Auto-Encoders .....	10616
<i>Linfang Zheng, Aleš Leonardis, Tze Ho Elden Tse, Nora Horanyi, Hua Chen, Wei Zhang, Hyung Jin Chang</i>	
Meta-Confidence Estimation for Stereo Matching .....	10624
<i>Seungryong Kim, Matteo Poggi, Sunok Kim, Kwanghoon Sohn, Stefano Mattocchia</i>	
CenterSnap: Single-Shot Multi-Object 3D Shape Reconstruction and Categorical 6D Pose and Size Estimation .....	10632
<i>Muhammad Zubair Irshad, Thomas Kollar, Michael Laskey, Kevin Stone, Zsolt Kira</i>	
Flow Supervised Neural Radiance Fields for Static-Dynamic Decomposition .....	10641
<i>Quei-An Chen, Akihiro Tsukada</i>	
SAFIT: Segmentation-Aware Scene Flow with Improved Transformer .....	10648
<i>Yukang Shi, Kaisheng Ma</i>	
AirLoop: Lifelong Loop Closure Detection .....	10664
<i>Dasong Gao, Chen Wang, Sebastian Scherer</i>	
R <sup>3</sup> LIVE: A Robust, Real-Time, RGB-Colored, LiDAR-Inertial-Visual Tightly-Coupled State Estimation and Mapping Package .....	10672
<i>Jiarong Lin, Fu Zhang</i>	
Multi-Agent Path Finding with Prioritized Communication Learning .....	10695
<i>Wenhao Li, Hongjun Chen, Bo Jin, Wenzhe Tan, Hongyuan Zha, Xiangfeng Wang</i>	
Distributed Timed Elastic Band (DTEB) Planner: Trajectory Sharing and Collision Prediction for Multi-Robot Systems .....	10702
<i>Yiu Ming Chung, Hazem Youssef, Moritz Roidl</i>	
Optimizing Space Utilization for More Effective Multi-Robot Path Planning .....	10709
<i>Shuai D. Han, Jingjin Yu</i>	
Robust-By-Design Plans for Multi-Robot Pursuit-Evasion .....	10716
<i>Trevor Olsen, Nicholas M. Stiffler, Jason M. O'Kane</i>	



Leveraging Smooth Attention Prior for Multi-Agent Trajectory Prediction .....	10723
<i>Zhangjie Cao, Erdem Biyik, Guy Rosman, Dorsa Sadigh</i>	
Optimal and Bounded-Suboptimal Multi-Goal Task Assignment and Path Finding.....	10731
<i>Xinyi Zhong, Jiaoyang Li, Sven Koenig, Hang Ma</i>	
Fast and Optimal Trajectory Planning for Multiple Vehicles in a Nonconvex and Cluttered Environment: Benchmarks, Methodology, and Experiments .....	10746
<i>Yakun Ouyang, Bai Li, Youmin Zhang, Tankut Acarman, Yuqing Guo, Tantan Zhang</i>	
Prioritized Planning for Cooperative Range-Only Localization in Multi-Robot Networks .....	10753
<i>Alan Papalía, Nicole Thumma, John Leonard</i>	
Multi-UAV Disaster Environment Coverage Planning with Limited-Endurance .....	10760
<i>Hongyu Song, Jincheng Yu, Jiantao Qiu, Zhixiao Sun, Kuijun Lang, Qing Luo, Yuan Shen, Yu Wang</i>	
Load-Sensitive Data Acquisition for a Tactile Sensor System of Multi-Fingered Robotic Hands.....	10767
<i>Ryusuke Ishizaki, Shun Ogiwara, Fumiya Hamatsu, Tomoyuki Sakurai, Hirofumi Shin, Takahide Yoshiike</i>	
Design of a Biomimetic Tactile Sensor for Material Classification .....	10774
<i>Kevin Dai, Xinyu Wang, Allison M. Rojas, Evan Harber, Yu Tian, Nicholas Paiva, Joseph Gnehm, Evan Schindewolf, Howie Choset, Victoria A. Webster-Wood, Lu Li</i>	
GelSlim 3.0: High-Resolution Measurement of Shape, Force and Slip in a Compact Tactile-Sensing Finger .....	10781
<i>Ian H. Taylor, Siyuan Dong, Alberto Rodriguez</i>	
Capacitive Tactile Sensor Using Mutual Capacitance Sensing Method for Increased Resolution.....	10788
<i>Jean-Christophe Sicotte-Brisson, Alexandre Bernier, Jennifer Kwiatkowski, Vincent Duchaine</i>	
SpecTac: A Visual-Tactile Dual-Modality Sensor Using UV Illumination .....	10844
<i>Qi Wang, Yipai Du, Michael Yu Wang</i>	
Parametric Path Optimization for Wheeled Robots Navigation .....	10883
<i>Zhiqiang Jian, Songyi Zhang, Jiahui Zhang, Shitao Chen, Nanning Zheng</i>	
Autonomous Vehicle Parking in Dynamic Environments: An Integrated System with Prediction and Motion Planning .....	10890
<i>Jessica Leu, Yebin Wang, Masayoshi Tomizuka, Stefano Di Cairano</i>	
Smoothing Away from the Edge for Mesh Estimation in Urban Outdoor Environments .....	10898
<i>Jason Pilbrough, Paul Amayo</i>	
Retriever: Point Cloud Retrieval in Compressed 3D Maps .....	10925
<i>Louis Wiesmann, Rodrigo Marcuzzi, Cyrill Stachniss, Jens Behley</i>	
Design and Tests of a Novel Adjustable-Stiffness Force Sensor.....	10933
<i>Xiantao Sun, Xiaoyu Xiong, Wenjie Chen, Yali Zhi, Weihai Chen, Yan Jin</i>	
A Low-Cost, Easy-To-Manufacture, Flexible, Multi-Taxel Tactile Sensor and Its Application to In-Hand Object Recognition .....	10939
<i>Tessa J. Pannen, Steffen Puhlmann, Oliver Brock</i>	

Soft-Jig: A Flexible Sensing Jig for Simultaneously Fixing and Estimating Orientation of Assembly Parts .....	10945
<i>Tatsuya Sakuma, Takuya Kiyokawa, Jun Takamatsu, Takahiro Wada, Tsukasa Ogasawara</i>	
Expanding the Design Space for Electrically-Driven Soft Robots Through Handed Shearing Auxetics .....	10951
<i>Ian Good, Tosh Brown-Moore, Aditya Patil, Daniel Revier, Jeffrey Ian Lipton</i>	
Multi-Dimensional Proprioception and Stiffness Tuning for Soft Robotic Joints .....	10973
<i>Zhonggui Fang, Chaoyi Huang, Yaxi Wang, Jiahao Xu, Jiyong Tan, Bin Li, Zichen Wang, Yige Wu, Anlun Huang, Juan Yi, Sicong Liu, Zheng Wang</i>	
Gaussian Belief Trees for Chance Constrained Asymptotically Optimal Motion Planning .....	11029
<i>Qi Heng Ho, Zachary N. Sunberg, Morteza Lahijanian</i>	
KinoJGM: A Framework for Efficient and Accurate Quadrotor Trajectory Generation and Tracking in Dynamic Environments .....	11036
<i>Yanran Wang, James O'Keefe, Qiuchen Qian, David Boyle</i>	
Non-Gaussian Risk Bounded Trajectory Optimization for Stochastic Nonlinear Systems in Uncertain Environments .....	11044
<i>Weiqiao Han, Ashkan Jasour, Brian Williams</i>	
Belief Space Planning: A Covariance Steering Approach .....	11051
<i>Dongliang Zheng, Jack Ridderhof, Panagiotis Tsiotras, Ali-Akbar Agha-Mohammadi</i>	
D2A-BSP: Distilled Data Association Belief Space Planning with Performance Guarantees Under Budget Constraints .....	11058
<i>Moshe Shienman, Vadim Indelman</i>	
Informative Planning for Worst-Case Error Minimisation in Sparse Gaussian Process Regression .....	11066
<i>Jennifer Wakulicz, Ki Myung Brian Lee, Chanyeol Yoo, Teresa Vidal-Calleja, Robert Fitch</i>	
Metareasoning for Safe Decision Making in Autonomous Systems .....	11073
<i>Justin Svegliato, Connor Basich, Sandhya Saisubramanian, Shlomo Zilberstein</i>	
Deliberation in Autonomous Robotic Surgery: A Framework for Handling Anatomical Uncertainty .....	11080
<i>Eleonora Tagliabue, Daniele Meli, Diego Dall'Alba, Paolo Fiorini</i>	
CCO-VOXEL: Chance Constrained Optimization Over Uncertain Voxel-Grid Representation for Safe Trajectory Planning .....	11087
<i>Sudarshan S Harithas, Rishabh Dev Yadav, Deepak Singh, Arun Kumar Singh, K Madhava Krishna</i>	
Stein Variational Probabilistic Roadmaps .....	11094
<i>Alexander Lambert, Brian Hou, Rosario Scalise, Siddhartha S. Srinivasa, Byron Boots</i>	
Is it Worth to Reason About Uncertainty in Occupancy Grid Maps During Path Planning? .....	11102
<i>Jacopo Banfi, Lindsey Woo, Mark Campbell</i>	
CPGNet: Cascade Point-Grid Fusion Network for Real-Time LiDAR Semantic Segmentation .....	11117
<i>Xiaoyan Li, Gang Zhang, Hongyu Pan, Zhenhua Wang</i>	
Fast Road Segmentation Via Uncertainty-Aware Symmetric Network .....	11124
<i>Yicong Chang, Feng Xue, Fei Sheng, Wenteng Liang, Anlong Ming</i>	

RangeBird: Multi View Panoptic Segmentation of 3D Point Clouds with Neighborhood Attention.....	11131
<i>Fabian Duerr, Hendrik Weigel, Jürgen Beyerer</i>	
Semantically Grounded Object Matching for Robust Robotic Scene Rearrangement .....	11138
<i>Walter Goodwin, Sagar Vaze, Ioannis Havoutis, Ingmar Posner</i>	
TraSeTR: Track-To-Segment Transformer with Contrastive Query for Instance-Level Instrument Segmentation in Robotic Surgery .....	11186
<i>Zixu Zhao, Yueming Jin, Pheng-Ann Heng</i>	
I Know You Can't See Me: Dynamic Occlusion-Aware Safety Validation of Strategic Planners for Autonomous Vehicles Using Hypergames .....	11202
<i>Maximilian Kahn, Atrisha Sarkar, Krzysztof Czarnecki</i>	
Mean Reflected Mass: A Physically Interpretable Metric for Safety Assessment and Posture Optimization in Human-Robot Interaction.....	11209
<i>Thomas Steinecker, Alexander Kurdas, Nico Mansfeld, Mazin Hamad, Robin Jeanne Kirschner, Saeed Abdolshah, Sami Haddadin</i>	
Intrusion Distance and Reaction Time Estimation for Safe and Efficient Industrial Robots.....	11216
<i>Aquib Rashid, Ibrahim Al Naser, Shuxiao Hou, Mohamad Bdiwi, Matthias Putz, Steffen Ihlenfeldt</i>	
A Continuous Learning Approach for Probabilistic Human Motion Prediction .....	11222
<i>Jie Xu, Shihong Wang, Xingyu Chen, Jiahao Zhang, Xuguang Lan, Nanning Zheng</i>	
Safety Assurances for Human-Robot Interaction Via Confidence-Aware Game-Theoretic Human Models.....	11229
<i>Ran Tian, Liting Sun, Andrea Bajcsy, Masayoshi Tomizuka, Anca D. Dragan</i>	
Roboethics as a Design Challenge: Lessons Learned from the Roboethics to Design and Development Competition.....	11244
<i>Jimin Rhim, Cheng Lin, Alexander Werner, Brandon Dehart, Vivian Qiang, Shalaleh Rismani, Ajung Moon</i>	
Multi-Arm Payload Manipulation Via Mixed Reality .....	11251
<i>Florian Kennel-Maushart, Roi Poranne, Stelian Coros</i>	
Effectiveness of Augmented Reality for Human Swarm Interactions .....	11258
<i>Sarjana Oradiambalam Sachidanandam, Sara Honarvar, Yancy Diaz-Mercado</i>	
Effects of Interfaces on Human-Robot Trust: Specifying and Visualizing Physical Zones .....	11265
<i>Marisa Hudspeth, Sogol Balali, Cindy Grimm, Ross T. Sowell</i>	
Towards Safe, Realistic Testbed for Robotic Systems with Human Interaction .....	11280
<i>Bhoram Lee, Jonathan Brookshire, Rhys Yahata, Supun Samarasekera</i>	
Object Memory Transformer for Object Goal Navigation .....	11288
<i>Rui Fukushima, Kei Ota, Asako Kanezaki, Yoko Sasaki, Yusuke Yoshiyasu</i>	
Uncertainty-Driven Planner for Exploration and Navigation.....	11295
<i>Georgios Georgakis, Bernadette Bucher, Anton Arapin, Karl Schmeckpeper, Nikolai Matni, Kostas Daniilidis</i>	
Visual Representation Learning for Preference-Aware Path Planning.....	11303
<i>Kavan Singh Sikand, Sadegh Rabiee, Adam Uccello, Xuesu Xiao, Garrett Warnell, Joydeep Biswas</i>	

Design and Experimental Investigation of a Vibro-Impact Self-Propelled Capsule Robot with Orientation Control.....	11381
<i>Jiajia Zhang, Jiyuan Tian, Dibin Zhu, Yang Liu, Shyam Prasad</i>	
A Novel Triad Twisted String Actuator for Controlling a Two Degrees of Freedom Joint: Design and Experimental Validation .....	11388
<i>Damian Crosby, Joaquin Carrasco, William Heath, Andrew Weightman</i>	
dSEDA: A Differential Series Elastic Damped Actuator .....	11395
<i>Simone Monteleone, Francesca Negrello, Giorgio Grioli, Manuel G. Catalano</i>	
Experimental Validation of the Usage of Kinematic Singularities to Produce Periodic High-Powered Motion .....	11402
<i>Chang Liu, Mark Plecnik</i>	
A Passively Adaptable Toroidal Continuously Variable Transmission Combined with Twisted String Actuator .....	11409
<i>Wonseok Shin, Sungbin Park, Gunhee Park, Jung Kim</i>	
Design Exploration and Experimental Characterization of a 6 Degrees-Of-Freedom Robotic Manipulator Powered by Cable-Driven Semi-Localized Magnetorheological Actuators .....	11416
<i>Mathieu Gervais, Louis-Philippe Lebel, Jean-Sébastien Plante</i>	
A Continuum Robot Surface of Woven, McKibben Muscles Embedded in and Giving Shape to Rooms.....	11432
<i>Grace Tan, Harrison Hidalgo, Hsin-Liu Kao, Ian D. Walker, Keith E. Green</i>	
Hydraulic Servo Booster for Serially Configured Modular Robots .....	11438
<i>Sang-Ho Hyon, Tomoro Kai</i>	
A Magnetorheological Fluid-Based Damper Towards Increased Biomimeticism in Soft Robotic Actuators* .....	11445
<i>Ravesh Sukhmandan, Kevin Dai, Victoria Webster-Wood</i>	
Multi-Agent Dynamic Ergodic Search with Low-Information Sensors .....	11480
<i>Howard Coffin, Ian Abraham, Guillaume Sartoretti, Tyler Dillstrom, Howie Choset</i>	
Self-Supervised Online Learning for Safety-Critical Control Using Stereo Vision .....	11487
<i>Ryan K. Cosner, Ivan D. Jimenez Rodriguez, Tamas G. Molnar, Wyatt Ubellacker, Yisong Yue, Aaron D. Ames, Katherine L. Bouman</i>	
Combining Planning and Learning of Behavior Trees for Robotic Assembly .....	11511
<i>Jonathan Styrud, Matteo Iovino, Mikael Norrlöf, Mårten Björkman, Christian Smith</i>	
RE:BT-Espresso: Improving Interpretability and Expressivity of Behavior Trees Learned from Robot Demonstrations .....	11518
<i>Adam Wathieu, Thomas R. Groechel, Haemin Jenny Lee, Chloe Kuo, Maja J. Mataric</i>	
Reinforcement Learning as a Method for Tuning CPG Controllers for Underwater Multi-Fin Propulsion.....	11533
<i>Anthony Drago, Gabe Carryon, James Tangorra</i>	
A Colored Petri Net Model for Control Problem of Border Crossing Under Constraints .....	11548
<i>Hela Kadri, Simon Collart-Dutilleul, Philippe Bon, Rochdi Merzouki</i>	

## Author Index