

1. Record Nr.	UNINA9910857796303321
Autore	Filipe Joaquim
Titolo	Robotics, Computer Vision and Intelligent Systems : 4th International Conference, ROBOVIS 2024, Rome, Italy, February 25-27, 2024, Proceedings
Pubbl/distr/stampa	Cham : , : Springer International Publishing AG, , 2024 ©2024
ISBN	3-031-59057-0
Edizione	[1st ed.]
Descrizione fisica	1 online resource (490 pages)
Collana	Communications in Computer and Information Science Series ; ; v.2077
Altri autori (Persone)	RöningJuha
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	<p>Intro -- Preface -- Organization -- Invited Speakers -- Learning with Privileged Information and Distillation for Multimodal Video Classification -- There's Plenty of Room at the Bottom: Opportunites and Challenges for Microrobotics -- Physical Models and Machine Learning for Photography and Astronomy -- Contents -- Compute Optimal Waiting Times for Collaborative Route Planning -- 1</p> <p>Introduction -- 2 Related Work -- 3 Optimal Waiting Times -- 3.1 Introductory Considerations -- 3.2 Model and Definitions -- 3.3 The Idea -- 3.4 The Algorithm -- 4 Extending the Approach for Collaborative Routing -- 4.1 Introduction -- 4.2 Critical Collisions -- 4.3 Resolving Critical Collisions -- 4.4 Putting All Together -- 5</p> <p>Evaluation -- 6 Conclusions -- References -- Robot Vision and Deep Learning for Automated Planogram Compliance in Retail -- 1</p> <p>Introduction -- 2 Images Capturing and Shelves Image Reconstruction -- 2.1 Robot Vision System and Images Capturing -- 2.2 Shelves Image Reconstruction -- 3 Planogram and Database -- 4 Object Detection -- 5 Planogram Compliance -- 6 Experimental Results -- 7 Conclusions -- References -- Park Marking Detection and Tracking Based on a Vehicle On-Board System of Fisheye Cameras -- 1 Introduction -- 2 Related Work -- 3 Methodology -- 3.1 Surround View System -- 3.2 Park Marking Detection -- 3.3 3D Ground Projection -- 3.4 Tracking and Multi-camera Fusion -- 4 Experiments -- 4.1 Dataset -- 4.2</p>

Quantitative Results -- 4.3 Qualitative Results -- 5 Conclusions -- References -- Analysis of Age Invariant Face Recognition Efficiency Using Face Feature Vectors -- 1 Introduction -- 2 Previous Work -- 3 Face Recognition Methods -- 3.1 InsightFace -- 4 Datasets -- 4.1 AgeDB -- 4.2 CASIA -- 4.3 LFW -- 5 Measurements Used in the Experiments -- 5.1 Similarity Between FFVs -- 5.2 Mean Average Precision -- 5.3 Bhattacharyya Measurements.

6 Results -- 6.1 Similarity Distributions -- 6.2 Pipeline Performance -- 6.3 Age Group Performance -- 6.4 Correlation Between Measurements -- 7 Discussion -- 8 Conclusion -- 8.1 Future Work -- References -- Uncertainty Driven Active Learning for Image Segmentation in Underwater Inspection -- 1 Introduction -- 2 Related Work -- 3 Method -- 4 Experimental Evaluation -- 5 Conclusion -- References -- Enhancing Connected Cooperative ADAS: Deep Learning Perception in an Embedded System Utilizing Fisheye Cameras -- 1 Introduction -- 2 Related Work -- 3 System Architecture -- 4 Perception -- 4.1 Embedded Computing -- 5 V2X Communication -- 6 LDM -- 7 Applications -- 8 Experiments and Results -- 8.1 Experimental Setup -- 8.2 Perception Evaluation -- 8.3 Communication Evaluation -- 8.4 System Limits -- 9 Conclusions -- References -- Weapon Detection Using PTZ Cameras -- 1 Introduction -- 2 Related Work -- 3 Tracking/Zoom System -- 4 Experiments -- 4.1 Experimental Setup -- 4.2 Model Training -- 4.3 Results -- 5 Conclusions and Future Work -- References -- Improving Semantic Mapping with Prior Object Dimensions Extracted from 3D Models -- 1 Introduction -- 2 Method Description -- 2.1 The Overall Semantic Mapping Process -- 2.2 Prior Knowledge -- 2.3 2D Geometric Association Method -- 2.4 Algorithm Description -- 3 Experimentation -- 3.1 Experimental Setup -- 3.2 Tuning the Scoring Function Weights -- 3.3 Evaluation of Polygon Simplification and Foreground Edges Selection -- 3.4 Evaluation of the Association Algorithm -- 4 Conclusion and Perspectives -- References -- Offline Deep Model Predictive Control (MPC) for Visual Navigation -- 1 Introduction -- 2 Related Work -- 3 Proposed Approach -- 3.1 Simulation Environment -- 3.2 Future Image Prediction, ViewNet -- 3.3 Control Policy with VelocityNet -- 3.4 Training VelocityNet.

3.5 Visual Trajectory Following with VelocityNet, Control Algorithm -- 4 Experimental Setup -- 4.1 Network Structure -- 4.2 Training -- 4.3 Parameters -- 5 Results Analysis -- 5.1 Linear Translation -- 5.2 Pure Rotation -- 5.3 Combined Translation and Rotation -- 5.4 Statistical Analysis -- 6 Conclusion -- References -- BiGSiD: Bionic Grasping with Edge-AI Slip Detection -- 1 Introduction -- 2 Related Work -- 3 Data Collection -- 3.1 Hardware Setting -- 3.2 Dataset -- 4 Proposed Method and Training the Model -- 4.1 Proposed Method -- 4.2 Training the Model -- 4.3 Experiments and Results -- 5 AI Edge-Device -- 5.1 Bringing AI to the Edge-Device -- 6 Conclusion -- References -- GAT-POSE: Graph Autoencoder-Transformer Fusion for Future Pose Prediction -- 1 Introduction -- 2 Related Works -- 2.1 Probabilistic Prediction -- 2.2 Deterministic Prediction -- 3 Methodology -- 3.1 Problem Formulation -- 3.2 Tokenization -- 3.3 Transformer Autoencoder with Future Masking -- 4 Experiment and Evaluation -- 4.1 Human3.6M -- 4.2 Evaluation Metrics -- 4.3 Results and Comparative Analysis -- 5 Conclusions and Future Work -- References -- UCORr: Wire Detection and Depth Estimation for Autonomous Drones -- 1 Introduction -- 2 Related Work -- 2.1 Wire Detection -- 2.2 Depth Estimation -- 3 Method -- 3.1 Motivation -- 3.2 UCORr Network Architecture -- 3.3 Loss Function -- 4 Experiments -- 4.1 Data -- 4.2 Metrics -- 4.3 Training -- 4.4 Results -- 4.5 Ablation Studies -- 5 Discussion -- 6 Conclusion -- References -- A Quality-Based Criteria

for Efficient View Selection -- 1 Introduction -- 2 Next-Best-View Selection -- 3 Selected NBV Algorithm -- 3.1 A Global Max-Flow Based Method -- 3.2 Problem Adaptation for Accuracy Improvement -- 4 Estimation of 3D Model Quality -- 4.1 From Existing 3D Quality Metrics... -- 4.2 ...to a Quality Metric for NBV.

5 Experiments on Simulated Data -- 5.1 Experimental Setup -- 5.2 Results and Analysis -- 6 Experiments on Synthetic Images -- 6.1 Experimental Setup -- 6.2 Results and Analysis -- 7 Conclusion -- References -- Multi-UAV Weed Spraying -- 1 Introduction -- 2 Problem Definition -- 3 Proposed System -- 3.1 Clustering -- 3.2 Finding the Proper Way-Points -- 3.3 Path-Planning -- 3.4 Online Collision Avoidance -- 4 Mapping -- 5 Spraying Technical Information -- 6 Experimentation -- 7 Conclusion and Future Work -- References -- Human Comfort Factors in People Navigation: Literature Review, Taxonomy and Framework -- 1 Introduction -- 2 People Navigation: Definition, Review and Classification -- 2.1 Definitions -- 2.2 Related Systematic Review -- 2.3 Taxonomy -- 3 Human Comfort Factors in People Navigation -- 3.1 Human Comfort Factors in Navigation Systems -- 3.2 Summary of Human Comfort Factors in People Navigation -- 4 Towards a People Navigation Framework -- 4.1 Human-Aware Navigation -- 4.2 Implementing Passenger Comfort Factors -- 5 Conclusion -- References -- Region Prediction for Efficient Robot Localization on Large Maps -- 1 Introduction -- 2 Background and Related Works -- 3 Methodology -- 3.1 Map Clustering -- 3.2 Region Prediction -- 3.3 Integration in RTAB-Map -- 4 Experiments and Results -- 4.1 Prediction Accuracy -- 4.2 Loop Closure Detection -- 4.3 Pose Estimation Accuracy -- 5 Conclusions and Future Works -- References -- Utilizing Dataset Affinity Prediction in Object Detection to Assess Training Data -- 1 Introduction and Related Work -- 2 Dataset Affinity Prediction -- 3 Dataset Alignment -- 4 Evaluation -- 5 Conclusion -- References -- Optimizing Mobile Robot Navigation Through Neuro-Symbolic Fusion of Deep Deterministic Policy Gradient (DDPG) and Fuzzy Logic -- 1 Introduction -- 1.1 Deep Deterministic Policy Gradient Algorithm.

1.2 Neuro-Symbolic Approach Through Fuzzy Logic in Reward Function -- 2 Methods -- 2.1 Overview of the Hybrid System Architecture of DDPG and Fuzzy Logic -- 2.2 Constructing DDPG Agent -- 2.3 Constructing Reward Function Using Fuzzy Logic -- 2.4 Agents' Training -- 3 Experiments and Results -- 3.1 DDPG Agent Training Results -- 3.2 Mobile Robot Simulation Results -- 4 Discussions -- 4.1 Overall Reward for DDPG Training -- 4.2 Mobile Robot Simulation Performance -- 4.3 Implementation of Fuzzy Logic in Reward Function -- 5 Conclusion -- References -- DAFDeTr: Deformable Attention Fusion Based 3D Detection Transformer -- 1 Introduction -- 2 Related Work -- 2.1 LiDAR-Only Approaches -- 2.2 Multi-modal Approaches -- 3 Methodology -- 3.1 Backbones -- 3.2 LiDAR Encoder -- 3.3 Query Initialization -- 3.4 LiDAR Decoder -- 3.5 Image Decoder -- 3.6 Loss -- 4 Experiments -- 4.1 Implementation Details -- 4.2 Results and Discussion -- 4.3 Ablation Studies -- 4.4 Qualitative Results -- 5 Conclusion -- References -- MDC-Net: Multimodal Detection and Captioning Network for Steel Surface Defects -- 1 Introduction -- 2 Literature Review -- 3 Methodology -- 3.1 Dataset Description -- 3.2 Dataset Preprocessing -- 3.3 Model Architecture -- 4 Implementation and Training -- 4.1 Hyperparameter Optimization -- 4.2 Reproducibility and Model Consistency -- 4.3 Loss Function and Optimization -- 5 Results and Discussion -- 6 Conclusion and Future Direction -- References -- Operational Modeling of Temporal Intervals for Intelligent Systems -- 1 Introduction -- 2 Proposed Approach -- 3

Application and Discussion -- 4 Conclusions -- References -- A Meta-MDP Approach for Information Gathering Heterogeneous Multi-agent Systems -- 1 Introduction -- 2 Background -- 2.1 Markov Decision Process -- 2.2 Partially Observable Markov Decision Process -- 3 Model -- 3.1 The Exploration POMDPs.
3.2 The Meta-MDP.
