

# **Advances in Intelligent Systems and Computing**

Volume 867

## **Series editor**

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Marcus Strand · Rüdiger Dillmann  
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# Intelligent Autonomous Systems 15

Proceedings of the 15th International  
Conference IAS-15

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ISSN 2194-5357

ISSN 2194-5365 (electronic)

Advances in Intelligent Systems and Computing

ISBN 978-3-030-01369-1

ISBN 978-3-030-01370-7 (eBook)

<https://doi.org/10.1007/978-3-030-01370-7>

Library of Congress Control Number: 2018955480

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This Springer imprint is published by the registered company Springer Nature Switzerland AG  
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

# Preface

This volume contains the papers presented at IAS-15, the 15th International Conference on Intelligent Autonomous Systems, one of the premier forums for the exchange of latest research results in the field of autonomous systems, its applications, and its impact on our society held on June 11–15, 2018, in Baden-Baden, Germany.

IAS-15 belongs to the most traditional robotics events, and we are proud to host it in Baden-Baden again. The goal of the IAS conference is to bring together leading researchers interested in all aspects of autonomy and adaptivity of artificial systems. One of the driving forces of this conference is the observation that intelligence and autonomy are best studied and demonstrated using various mobile robots acting autonomously in large rough terrain, underwater, air, or space under challenging conditions.

For the second time, the International Conference on Intelligent Autonomous Systems (IAS) is held in Baden-Baden and for the first time is organized by the three institutions DHBW, KIT, and FZI in Karlsruhe and strongly supported by the University of Padova.

The total amount of 97 papers have been submitted to IAS-15 with latest research accomplishments, innovations, and visions in the field of robotics, artificial intelligence, machine learning, and its applications. Each paper was evaluated by two to four reviewers, and finally, 78 papers have been accepted for presentation at the conference after several rebuttal iterations. Additionally, two invited talks are included in the conference proceedings.

The papers contained in the proceedings cover a wide spectrum of research in intelligent autonomous systems including multi-agent systems, motion planning, robot control, handling uncertainty with probabilistic logic, navigation, human-machine interaction, computer vision and perception as well as unmanned aerial systems and unmanned driving.

The proceedings include all accepted papers and reflect a variety of topics concerning intelligent autonomous systems and their impact to industry and society. The organizers would like to express their gratitude to all contributors in the preparation phase and during the evaluation phase and the conference. Thanks to

this additional assistance, IAS-15 could be such a success. We would especially like to thank the program committee members for their valuable support and for the preparation of the reviews, which allowed to make a proper selection of high-quality papers. The staff of the three organizing institutions took a great part in planning and organizing the conference. Thanks to VDI/VDE for supporting the organization of the conference and to the sponsoring companies Sick AG, Bosch AG, and Intel for their financial support making this event possible.

We hope that this proceedings, and especially the participation in the IAS-15 conference and its related events, inspires new ideas, fosters new research, and creates new friendships which grow into fruitful collaborations.

Finally, we thank the city of Baden-Baden for hosting IAS for the second time. Organizing IAS-15 was a wonderful experience, and we hope that the conference gives its participants as much pleasure as we had when preparing it. Enjoy the proceedings of IAS-15.

Marcus Strand  
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# Contents

<b>Path Planning, Localization and Navigation</b>	
<b>A Viterbi-like Approach for Trajectory Planning with Different Maneuvers . . . . .</b>	<b>3</b>
Jörg Roth	
<b>Improving Relaxation-Based Constrained Path Planning via Quadratic Programming . . . . .</b>	<b>15</b>
Franco Fusco, Olivier Kermorgant, and Philippe Martinet	
<b>Robust Path Planning Against Pose Errors for Mobile Robots in Rough Terrain . . . . .</b>	<b>27</b>
Yuki Doi, Yonghoon Ji, Yusuke Tamura, Yuki Ikeda, Atsushi Umemura, Yoshiharu Kaneshima, Hiroki Murakami, Atsushi Yamashita, and Hajime Asama	
<b>Stereo Vision-Based Optimal Path Planning with Stochastic Maps for Mobile Robot Navigation . . . . .</b>	<b>40</b>
Taimoor Shakeel Sheikh and Ilya M. Afanasyev	
<b>Variance Based Trajectory Segmentation in Object-Centric Coordinates . . . . .</b>	<b>56</b>
Iori Yanokura, Masaki Murooka, Shunichi Nozawa, Kei Okada, and Masayuki Inaba	
<b>MILP-Based Dual-Arm Motion Planning Considering Shared Transfer Path for Pick-Up and Place . . . . .</b>	<b>67</b>
Jun Kurosu, Ayanori Yorozu, and Masaki Takahashi	
<b>Multiple Path Planner Integration for Obstacle Avoidance: MoveIt! and Potential Field Planner Synergy . . . . .</b>	<b>78</b>
Emanuele Sansebastiano and Angel P. del Pobil	

<b>An Integrated Planning of Exploration, Coverage, and Object Localization for an Efficient Indoor Semantic Mapping . . . . .</b>	<b>86</b>
Diar Fahrudin Sasongko and Jun Miura	
<b>Unsupervised Hump Detection for Mobile Robots Based On Kinematic Measurements and Deep-Learning Based Autoencoder . . . . .</b>	<b>99</b>
Oliver Rettig, Silvan Müller, Marcus Strand, and Darko Katic	
<b>Efficient Coverage of Unstructured Environments . . . . .</b>	<b>111</b>
Elias Khsheibun, Norman Kohler, and Maren Bennewitz	
<b>Intelligent Systems</b>	
<b>Probabilistic Logic for Intelligent Systems . . . . .</b>	<b>129</b>
Thomas C. Henderson, Robert Simmons, Bernard Serbinowski, Xiuyi Fan, Amar Mitiche, and Michael Cline	
<b>Aggregating Models for Anomaly Detection in Space Systems: Results from the FCTMAS Study . . . . .</b>	<b>142</b>
Francesco Amigoni, Maurizio Ferrari Dacrema, Alessandro Donati, Christian Laroque, Michèle Lavagna, and Alessandro Riva	
<b>Detection of Motion Patterns and Transition Conditions for Automatic Flow Diagram Generation of Robotic Tasks . . . . .</b>	<b>161</b>
Guilherme de Campos Affonso, Kei Okada, and Masayuki Inaba	
<b>Least Action Sequence Determination in the Planning of Non-prehensile Manipulation with Multiple Mobile Robots . . . . .</b>	<b>174</b>
Changxiang Fan, Shouhei Shirafuji, and Jun Ota	
<b>Convolutional Channel Features-Based Person Identification for Person Following Robots . . . . .</b>	<b>186</b>
Kenji Koide and Jun Miura	
<b>Service Robot Using Estimation of Body Direction Based on Gait for Human-Robot Interaction . . . . .</b>	<b>199</b>
Ayanori Yorozu and Masaki Takahashi	
<b>Accurate Pouring with an Autonomous Robot Using an RGB-D Camera . . . . .</b>	<b>210</b>
Chau Do and Wolfram Burgard	
<b>MS3D: Mean-Shift Object Tracking Boosted by Joint Back Projection of Color and Depth . . . . .</b>	<b>222</b>
Yongheng Zhao and Emanuele Menegatti	
<b>Heterogeneous Multi-agent Routing Strategy for Robot-and-Picker-to-Good Order Fulfillment System . . . . .</b>	<b>237</b>
Hanfu Wang, Weidong Chen, and Jingchuan Wang	

## **Multiple Mobile Robot Management System for Transportation Tasks in Automated Laboratories Environment . . . . . 250**

Ali A. Abdulla, Steffen Junginger, X. Gu, Norbert Stoll,  
and Kerstin Thurow

## **Robot Design**

### **A Rolling Contact Joint Lower Extremity Exoskeleton Knee . . . . . 263**

Jonas Beil and Tamim Asfour

### **Towards a Stair Climbing Robot System Based on a Re-configurable Linkage Mechanism . . . . . 278**

Omar El-Farouk E. Labib, Sarah W. El-Safty, Silvan Mueller,  
Thomas Haalboom, and Marcus Strand

### **Can Walking Be Modeled in a Pure Mechanical Fashion . . . . . 289**

Antonio D'Angelo

### **Modular Robot that Modeled Cell Membrane Dynamics of a Cellular Slime Mold . . . . . 302**

Ryusuke Fuse, Masahiro Shimizu, Shuhei Ikemoto, and Koh Hosoda

### **Locomotion of Hydraulic Amoeba-Like Robot Utilizing Transition of Mass Distribution . . . . . 314**

Takashi Takuma and Kyotaro Hamachi

### **Common Dimensional Autoencoder for Identifying Agonist-Antagonist Muscle Pairs in Musculoskeletal Robots . . . . . 325**

Hiroaki Masuda, Shuhei Ikemoto, and Koh Hosoda

### **Analysis of Variable-Stiffness Soft Finger Joints . . . . . 334**

Daniel Cardin-Catalan, Angel P. del Pobil, and Antonio Morales

### **Method for Robot to Create New Function by Uniting with Surrounding Objects . . . . . 346**

Yukio Morooka and Ikuo Mizuuchi

## **Sensing and Actuation**

### **Configuration Depending Crosstalk Torque Calibration for Robotic Manipulators with Deep Neural Regression Models . . . . . 361**

Adrian Zwiener, Sebastian Otte, Richard Hanten, and Andreas Zell

### **Simulation of the SynTouch BioTac Sensor . . . . . 374**

Philipp Ruppel, Yannick Jonetzko, Michael Görner, Norman Hendrich,  
and Jianwei Zhang

### **Force Sensing for Multi-point Contact Using a Constrained, Passive Joint Based on the Moment-Equivalent Point . . . . . 388**

Shouhei Shirafuji and Jun Ota

<b>Simulation and Transfer of Reinforcement Learning Algorithms for Autonomous Obstacle Avoidance</b> .....	401
Max Lenk, Paula Hilsendegen, Silvan Michael Müller, Oliver Rettig, and Marcus Strand	
<b>HI-VAL: Iterative Learning of Hierarchical Value Functions for Policy Generation</b> .....	414
Roberto Capobianco, Francesco Riccio, and Daniele Nardi	
<b>Learning-Based Task Failure Prediction for Selective Dual-Arm Manipulation in Warehouse Stowing</b> .....	428
Shingo Kitagawa, Kentaro Wada, Kei Okada, and Masayuki Inaba	
<b>Learning of Motion Primitives Using Reference-Point-Dependent GP-HSMM for Domestic Service Robots</b> .....	440
Kensuke Iwata, Tomoaki Nakamura, and Takayuki Nagai	
<b>Nonlinear Model Predictive Control for Two-Wheeled Service Robots</b> .....	452
Shunichi Sekiguchi, Ayanori Yorozu, Kazuhiro Kuno, Masaki Okada, Yutaka Watanabe, and Masaki Takahashi	
<b>A Generalised Method for Adaptive Longitudinal Control Using Reinforcement Learning</b> .....	464
Shashank Pathak, Suvam Bag, and Vijay Nadkarni	
<b>Reconstructing State-Space from Movie Using Convolutional Autoencoder for Robot Control</b> .....	480
Kazuma Takahara, Shuhei Ikemoto, and Koh Hosoda	
<b>BSplines Properties with Interval Analysis for Constraint Satisfaction Problem: Application in Robotics</b> .....	490
Rawan Kalawoun, Sébastien Lengagne, François Bouchon, and Youcef Mezouar	
<b>Human Detection and Interaction</b>	
<b>Robot Vision System for Real-Time Human Detection and Action Recognition</b> .....	507
Satoshi Hoshino and Kyohei Niimura	
<b>Movement Based Classification of People with Stroke Through Automated Analysis of Three-Dimensional Motion Data</b> .....	520
John W. Kelly, Steve Leigh, Carol Giuliani, Rachael Brady, Martin J. McKeown, and Edward Grant	
<b>Real-Time Marker-Less Multi-person 3D Pose Estimation in RGB-Depth Camera Networks</b> .....	534
Marco Carraro, Matteo Munaro, Jeff Burke, and Emanuele Menegatti	

<b>People Finding Under Visibility Constraints Using Graph-Based Motion Prediction</b> . . . . .	546
AbdElMoniem Bayoumi, Philipp Karkowski, and Maren Bennewitz	
<b>Proposal and Validation of an Index for the Operator's Haptic Sensitivity in a Master-Slave System</b> . . . . .	558
Dongbo Zhou and Kotaro Tadano	
<b>Operating a Robot by Nonverbal Voice Expressed with Acoustic Features</b> . . . . .	573
Shizuka Takahashi and Ikuo Mizuuchi	
<b>Reduced Feature Set for Emotion Recognition Based on Angle and Size Information</b> . . . . .	585
Patrick Dunau, Mike Bonny, Marco F. Huber, and Jürgen Beyerer	
<b>Multimodal Path Planning Using Potential Field for Human-Robot Interaction</b> . . . . .	597
Yosuke Kawasaki, Ayanori Yorozu, and Masaki Takahashi	
<b>2D and 3D Computer Vision for Robotics</b>	
<b>Deep Learning Waterline Detection for Low-Cost Autonomous Boats</b> . . . . .	613
Lorenzo Steccanella, Domenico Bloisi, Jason Blum, and Alessandro Farinelli	
<b>Context-Aware Recognition of Drivable Terrain with Automated Parameters Estimation</b> . . . . .	626
Jan Wietrzykowski and Piotr Skrzypczyński	
<b>Crop Edge Detection Based on Stereo Vision</b> . . . . .	639
Johannes Kneip, Patrick Fleischmann, and Karsten Berns	
<b>Extracting Structure of Buildings Using Layout Reconstruction</b> . . . . .	652
Matteo Luperto and Francesco Amigoni	
<b>Unknown Object Detection by Punching: An Impacting-Based Approach to Picking Novel Objects</b> . . . . .	668
Yusuke Maeda, Hideki Tsuruga, Hiroyuki Honda, and Shota Hirono	
<b>Efficient Semantic Segmentation for Visual Bird's-Eye View Interpretation</b> . . . . .	679
Timo Sämann, Karl Amende, Stefan Milz, Christian Witt, Martin Simon, and Johannes Petzold	
<b>Concept Study for Vehicle Self-Localization Using Neural Networks for Detection of Pole-Like Landmarks</b> . . . . .	689
Achim Kampker, Jonas Hatzenbuehler, Lars Klein, Mohsen Sefati, Kai D. Kreiskoehter, and Denny Gert	

<b>Cross Domain Image Transformation Using Effective Latent Space Association</b> .....	706
Naeem Ul Islam and Sukhan Lee	
<b>Global Registration of Point Clouds for Mapping</b> .....	717
Carlos Sánchez, Simone Ceriani, Pierluigi Taddei, Erik Wolfart, and Vítor Sequeira	
<b>Cluster ICP: Towards Sparse to Dense Registration</b> .....	730
Mohamed Lamine Tazir, Tawsif Gokhool, Paul Checchin, Laurent Malaterre, and Laurent Trassoudaine	
<b>Markerless Ad-Hoc Calibration of a Hyperspectral Camera and a 3D Laser Scanner</b> .....	748
Felix Igelbrink, Thomas Wiemann, Sebastian Pütz, and Joachim Hertzberg	
<b>Predicting the Next Best View for 3D Mesh Refinement</b> .....	760
Luca Morreale, Andrea Romanoni, and Matteo Matteucci	
<b>Robotic Applications</b>	
<b>Grasping Strategies for Picking Items in an Online Shopping Warehouse</b> .....	775
Nataliya Nechyporenko, Antonio Morales, and Angel P. del Pobil	
<b>Learning Based Industrial Bin-Picking Trained with Approximate Physics Simulator</b> .....	786
Ryo Matsumura, Kensuke Harada, Yukiyasu Domae, and Weiwei Wan	
<b>Tool Exchangeable Grasp/Assembly Planner</b> .....	799
Kensuke Harada, Kento Nakayama, Weiwei Wan, Kazuyuki Nagata, Natsuki Yamanobe, and Ixchel G. Ramirez-Alpizar	
<b>Daily Assistive Robot Uses a Bag for Carrying Objects with Pre-contact Sensing Gripper</b> .....	812
Naoya Yamaguchi, Shun Hasegawa, Kei Okada, and Masayuki Inaba	
<b>Design of an Adaptive Force Controlled Robotic Polishing System Using Adaptive Fuzzy-PID</b> .....	825
Hsien-I Lin and Vipul Dubey	
<b>Efficient, Collaborative Screw Assembly in a Shared Workspace</b> .....	837
Christian Juel, Andreas Hermann, Arne Roennau, and Rüdiger Dillmann	
<b>KittingBot: A Mobile Manipulation Robot for Collaborative Kitting in Automotive Logistics</b> .....	849
Dmytro Pavlichenko, Germán Martín García, Seongyong Koo, and Sven Behnke	

**User-Friendly Intuitive Teaching Tool for Easy and Efficient Robot Teaching in Human-Robot Collaboration** . . . . . 865  
Hyunmin Do, Taeyong Choi, Dong Il Park, Hwi-su Kim,  
and Chanhun Park

**A Critical Reflection on the Expectations About the Impact of Educational Robotics on Problem Solving Capability** . . . . . 877  
Francesca Agatolio, Michele Moro, Emanuele Menegatti,  
and Monica Pivetti

**Inferring Capabilities by Experimentation** . . . . . 889  
Ashwin Khadke and Manuela Veloso

**Triggering Robot Hand Reflexes with Human EMG Data Using Spiking Neurons** . . . . . 902  
J. Camilo Vasquez Tieck, Sandro Weber, Terrence C. Stewart,  
Arne Roennau, and Rüdiger Dillmann

**A Localizability Constraint-Based Path Planning Method for Unmanned Aerial Vehicle** . . . . . 917  
Behnam Irani, Weidong Chen, and Jingchuan Wang

**Using IMU Sensor and EKF Algorithm in Attitude Control of a Quad-Rotor Helicopter** . . . . . 933  
Jongwoo An and Jangmyung Lee

**Unmanned Aerial Vehicles in Wireless Sensor Networks: Automated Sensor Deployment and Mobile Sink Nodes** . . . . . 943  
Juan Marchal Gomez, Thomas Wiedemann, and Dmitriy Shutin

**A Multi-layer Autonomous Vehicle and Simulation Validation Ecosystem Axis: ZalaZONE** . . . . . 954  
Zsolt Szalay, Zoltán Hamar, and Peter Simon

**Towards Large Scale Urban Traffic Reference Data: Smart Infrastructure in the Test Area Autonomous Driving Baden-Württemberg** . . . . . 964  
Tobias Fleck, Karam Daaboul, Michael Weber, Philip Schörner,  
Marek Wehmer, Jens Doll, Stefan Orf, Nico Sußmann,  
Christian Hubschneider, Marc René Zofka, Florian Kuhnt, Ralf Kohlhaas,  
Ingmar Baumgart, Raoul Zöllner, and J. Marius Zöllner

**Author Index** . . . . . 983