

Contents

Best Paper Award for Scientific Contribution

- On Recognizing Transparent Objects in Domestic Environments
Using Fusion of Multiple Sensor Modalities 3
Alexander Hagg, Frederik Hegger, and Paul G. Plöger

Best Paper Award for Engineering Contribution

- Ball Localization for Robocup Soccer Using Convolutional
Neural Networks 19
Daniel Speck, Pablo Barros, Cornelius Weber, and Stefan Wermter

Oral Presentations

- Kick Motions for the NAO Robot Using Dynamic Movement Primitives 33
Arne Böckmann and Tim Laue
- Learning a Humanoid Kick with Controlled Distance 45
*Abbas Abdolmaleki, David Simões, Nuno Lau, Luis Paulo Reis,
and Gerhard Neumann*
- Boundedness Approach to Gait Planning for the Flexible Linear
Inverted Pendulum Model 58
Leonardo Lanari, Oliver Urbann, Seth Hutchinson, and Ingmar Schwarz
- A Closed-Loop Gait for Humanoid Robots Combining LIPM
with Parameter Optimization. 71
Andreas Seekircher and Ubbo Visser
- Opponent-Aware Ball-Manipulation Skills for an Autonomous
Soccer Robot 84
Philip Cooksey, Juan Pablo Mendoza, and Manuela Veloso
- Distributed Averages of Gradients (DAG): A Fast Alternative
for Histogram of Oriented Gradients 97
*M. Hossein Mirabdollah, Mahmoud A. Mohamed,
and Bärbel Mertsching*
- Classifying the Strategies of an Opponent Team Based on a Sequence
of Actions in the RoboCup SSL 109
Yusuke Adachi, Masahide Ito, and Tadashi Naruse

A 3D Face Modelling Approach for Pose-Invariant Face Recognition in a Human-Robot Environment	121
<i>Michael Grupp, Philipp Kopp, Patrik Huber, and Matthias Rättsch</i>	
UT Austin Villa RoboCup 3D Simulation Base Code Release	135
<i>Patrick MacAlpine and Peter Stone</i>	
Progress in RoboCup Revisited: The State of Soccer Simulation 2D	144
<i>Thomas Gabel, Egbert Falkenberg, and Eicke Godehardt</i>	
An Integration Challenge to Bridge the Gap Among Industry-Inspired RoboCup Leagues.	157
<i>Sebastian Zug, Tim Niemueller, Nico Hochgeschwender, Kai Seidensticker, Martin Seidel, Tim Friedrich, Tobias Neumann, Ulrich Karras, Gerhard K. Kraetzschmar, and Alexander Ferrein</i>	
Dynaban, an Open-Source Alternative Firmware for Dynamixel Servo-Motors	169
<i>Rémi Fabre, Quentin Rouxel, Grégoire Passault, Steve N’Guyen, and Olivier Ly</i>	
Poster Presentations	
RoCKIn and the European Robotics League: Building on RoboCup Best Practices to Promote Robot Competitions in Europe.	181
<i>Pedro U. Lima, Daniele Nardi, Gerhard K. Kraetzschmar, Rainer Bischoff, and Matteo Matteucci</i>	
Simulation Based Selection of Actions for a Humanoid Soccer-Robot	193
<i>Heinrich Mellmann, Benjamin Schlotter, and Christian Blum</i>	
Robust Tracking of Multiple Soccer Robots Using Random Finite Sets	206
<i>Pablo Cano and Javier Ruiz-del-Solar</i>	
Adaptive Field Detection and Localization in Robot Soccer	218
<i>Yongbo Qian and Daniel D. Lee</i>	
Real-Time Visual Tracking and Identification for a Team of Homogeneous Humanoid Robots	230
<i>Hafez Farazi and Sven Behnke</i>	
Effective Multi-robot Spatial Task Allocation Using Model Approximations	243
<i>Okan Aşık and H. Levent Akın</i>	
Using Monte Carlo Search with Data Aggregation to Improve Robot Soccer Policies	256
<i>Francesco Riccio, Roberto Capobianco, and Daniele Nardi</i>	

Cooperative Sensing for 3D Ball Positioning in the RoboCup Middle Size League.	268
<i>Wouter Kuijpers, António J.R. Neves, and René van de Molengraft</i>	
Object Learning and Grasping Capabilities for Robotic Home Assistants	279
<i>S. Hamidreza Kasaei, Nima Shafii, Luís Seabra Lopes, and Ana Maria Tomé</i>	
RGB-D-Based Features for Recognition of Textureless Objects.	294
<i>Santosh Thoduka, Stepan Pavezka, Alexander Moriarty, and Gerhard K. Kraetzschmar</i>	
Prioritized Role Assignment for Marking	306
<i>Patrick MacAlpine and Peter Stone</i>	
MRS�aserMap: Local Multiresolution Grids for Efficient 3D Laser Mapping and Localization	319
<i>David Droeschel and Sven Behnke</i>	
Robust Collision Avoidance for Autonomous Mobile Robots in Unknown Environments.	327
<i>Muhammad Mujahed, Dirk Fischer, and Bärbel Mertsching</i>	
Robots as Individuals in the Humanoid League.	339
<i>Maike Paetzel, Jacky Baltes, and Reinhard Gerndt</i>	
RAFCON: A Graphical Tool for Task Programming and Mission Control . . .	347
<i>Sebastian G. Brunner, Franz Steinmetz, Rico Belder, and Andreas Dömel</i>	
Communication-Less Cooperation Between Soccer Robots.	356
<i>Wei Dai, Qinghua Yu, Junhao Xiao, and Zhiqiang Zheng</i>	
Decentralized Reinforcement Learning Applied to Mobile Robots	368
<i>David L. Leottau, Aashish Vatsyayan, Javier Ruiz-del-Solar, and Robert Babuška</i>	
Searching Objects in Known Environments: Empowering Simple Heuristic Strategies.	380
<i>Ramon Izquierdo-Cordova, Eduardo F. Morales, L. Enrique Sucar, and Rafael Murrieta-Cid</i>	
A Deep Learning Approach for Object Recognition with NAO Soccer Robots	392
<i>Dario Albani, Ali Youssef, Vincenzo Suriani, Daniele Nardi, and Domenico Daniele Bloisi</i>	

Impact Force Reduction Using Variable Stiffness with an Optimal Approach for Falling Robots	404
<i>Juan Calderon, Gustavo A. Cardona, Martin Llofriu, Muhaimen Shamsi, Fallon Williams, Wilfrido Moreno, and Alfredo Weitzenfeld</i>	
Robust Multi-modal Detection of Industrial Signal Light Towers	416
<i>Victor Mataré, Tim Niemueller, and Gerhard Lakemeyer</i>	
Selecting the Best Player Formation for Corner-Kick Situations Based on Bayes’ Estimation.	428
<i>Jordan Henrio, Thomas Henn, Tomoharu Nakashima, and Hidehisa Akiyama</i>	
Standard Rescue Tasks Based on the Japan Virtual Robotics Challenge	440
<i>Masaru Shimizu, Masayuki Okugawa, Katsuji Oogane, Yoshikazu Ohtsubo, Tetsuya Kimura, Tomoichi Takahashi, and Satoshi Tadokoro</i>	
Virtually Adapted Reality and Algorithm Visualization for Autonomous Robots.	452
<i>Danny Zhu and Manuela Veloso</i>	
Champion Papers	
RoboCup 2016 Best Humanoid Award Winner Team Baset Adult-Size	467
<i>Mojtaba Hosseini, Vahid Mohammadi, Farhad Jafari, and Esfandiar Bamdad</i>	
RoboCup 2016 Humanoid TeenSize Winner NimbRo: Robust Visual Perception and Soccer Behaviors.	478
<i>Hafez Farazi, Philipp Allgeuer, Grzegorz Ficht, André Brandenburger, Dmytro Pavlichenko, Michael Schreiber, and Sven Behnke</i>	
Rhoban Football Club: RoboCup Humanoid Kid-Size 2016 Champion Team Paper	491
<i>Julien Allali, Louis Deguillaume, Rémi Fabre, Loic Gondry, Ludovic Hofer, Olivier Ly, Steve N’Guyen, Grégoire Passault, Antoine Pirrone, and Quentin Rouxel</i>	
B-Human 2016 – Robust Approaches for Perception and State Estimation Under More Natural Conditions	503
<i>Thomas Röfer, Tim Laue, and Jesse Richter-Klug</i>	
UT Austin Villa: RoboCup 2016 3D Simulation League Competition and Technical Challenges Champions	515
<i>Patrick MacAlpine and Peter Stone</i>	

Disruptive Innovations in RoboCup 2D Soccer Simulation League:
 From Cyberoos'98 to Gliders2016. 529
Mikhail Prokopenko and Peter Wang

Tech United Eindhoven Middle Size League Winner 2016. 542
*Ferry Schoenmakers, Koen Meessen, Yanick Douven, Harrie van de Loo,
 Dennis Bruijnen, Wouter Aangenant, Bob van Ninhuijs, Matthias Briegel,
 Patrick van Brakel, Jordy Senden, Robin Soetens, Wouter Kuijpers,
 Joris Reijrink, Camiel Beeren, Marjon van 't Klooster, Lotte de Koning,
 and René van de Molengraft*

iRAP Robot: World RoboCup Rescue Championship 2016 and Best
 in Class Mobility Award 554
Amornphun Phunopas, Aran Blattler, and Noppadol Pudchuen

RoboCup Rescue Simulation System 2016 Champion Team Paper 565
Pooya Deldar Gohardani, Siavash Mehrabi, and Peyman Ardestani

ToBI – Team of Bielefeld: Enhancing Robot Behaviors and the Role
 of Multi-robotics in RoboCup@Home 577
*Sebastian Meyer zu Borgsen, Timo Korthals, Florian Lier,
 and Sven Wachsmuth*

Improvements for a Robust Production in the RoboCup Logistics
 League 2016 589
*Tim Niemueller, Tobias Neumann, Christoph Henke, Sebastian Schönitz,
 Sebastian Reuter, Alexander Ferrein, Sabina Jeschke,
 and Gerhard Lakemeyer*

Staying on Top at RoboCup@Work 2016 601
*Torben Carstensen, Jan Carstensen, Andrej Dick, Sven Falkenhain,
 Jens Hübner, Robin Kammel, Alexander Wentz, Simon Aden,
 Jan Friederichs, and Jens Kotlarski*

Team Delft’s Robot Winner of the Amazon Picking Challenge 2016. 613
*Carlos Hernandez, Mukunda Bharatheesha, Wilson Ko, Hans Gaiser,
 Jethro Tan, Kanter van Deurzen, Maarten de Vries, Bas Van Mil,
 Jeff van Egmond, Ruben Burger, Mihai Morariu, Jihong Ju,
 Xander Germann, Ronald Ensing, Jan Van Frankenhuyzen,
 and Martijn Wisse*

First International HARTING Open Source Prize Winner:
 The igus Humanoid Open Platform 625
*Philipp Allgeuer, Grzegorz Ficht, Hafez Farazi, Michael Schreiber,
 and Sven Behnke*

International Harting Open Source Award 2016: Fawkes
for the RoboCup Logistics League 634
*Tim Niemueller, Tobias Neumann, Christoph Henke, Sebastian Schönitz,
Sebastian Reuter, Alexander Ferrein, Sabina Jeschke,
and Gerhard Lakemeyer*

Author Index 643



<http://www.springer.com/978-3-319-68791-9>

RoboCup 2016: Robot World Cup XX
Behnke, S.; Sheh, R.; Sariel, S.; Lee, D.D. (Eds.)
2017, XVIII, 645 p. 313 illus., Softcover
ISBN: 978-3-319-68791-9