


[C1] Amin, Sikandar, Müller, Philipp, Bulling, Andreas, Andriluka and Mykhaylo, Test-time Adaptation for 3D Human Pose Estimation, German Conference on Pattern Recognition (GCPR/DAGM), Münster, Germany, September 2014.

[C2] Belagiannis, Vasileios, Amin, Sikandar, Andriluka, Mykhaylo, Schiele, Bernt, Navab, Nasser, Ilic and Slobodan, 3D Pictorial Structures for Multiple Human Pose Estimation, 2014 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Columbus, Ohio, United States, June 2014.


[C1] Thomas Witzig, J. Marius Zöllner, Dejan Pangeric, Sarah Osentoski, Philip Roan, Rainer Jäkel and Rüdiger Dillmann,
Context Aware Shared Autonomy for Robotic Manipulation Tasks,

[C2] Karol Hausman, Ferenc Balint-Benczedi, Dejan Pangeric, Zoltan-Csaba Marton, Ryohei Ueda, Kei Okada and Michael Beetz,
Tracking-based Interactive Segmentation of Textureless Objects,

[C3] Amin, Sikandar, Mykhaylo Andriluka, Rohrbach, Marcus, Schiele and Bernt,
Multi-view Pictorial Structures for 3D Human Pose Estimation,
British Machine Vision Conference (BMVC), Bristol, UK, 2013.

[C4] Charmayne Mary Lee Hughes, Moritz Tenorth, Marta Bienkiewicz and Joachim Hermsdörfer,
Action sequencing and error production in stroke patients with apraxia – Behavioral modeling using Bayesian Logic Networks,
6th International Conference on Health Informatics (HEALTHINF 2013), Barcelona, Spain, February 11–14 2013.

[C5] Moritz Tenorth, Fernando De la Torre and Michael Beetz,
Learning Probability Distributions over Partially-Ordered Human Everyday Activities,

[C6] Lorenz Mösenlechner and Michael Beetz,
Fast Temporal Projection Using Accurate Physics-Based Geometric Reasoning,

[C7] Kriegel, Simon, Brucker, Manuel, Marton, Zoltan-Csaba, Bodenmuller, Tim, Suppa and Michael,
Combining object modeling and recognition for active scene exploration,

[C8] Rink, Christian, Marton, Zoltan-Csaba, Seth, Daniel, Bodenmuller, Tim, Suppa and Michael,
Feature based particle filter registration of 3D surface models and its application in robotics,

[C9] Nissler, Christian, Marton, Zoltan-Csaba, Suppa and Michael,
Sample consensus fitting of bivariate polynomials for initializing EM-based modeling of smooth 3D surfaces,


[C5] Rohrbach, Marcus, Amin, Sikandar, Andriluka, Mykhaylo, Schiele and Bernt,  
A Database for Fine Grained Activity Detection of Cooking Activities,  
2012 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), Providence,  
United States, June 2012.

[C6] Martin Schuster, Dominik Jain, Moritz Tenorth and Michael Beetz,  
Learning Organizational Principles in Human Environments,  
IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA,  

[C7] Thomas Rühr, Jürgen Sturm, Dejan Pangercic, Michael Beetz and Daniel Cremers,  
A Generalized Framework for Opening Doors and Drawers in Kitchen Environments,  
IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA,  
May 14–18 2012.

[C8] Moritz Tenorth, Alexander Clifford Perzylo, Reinhard Lafrenz and Michael Beetz,  
The RoboEarth language: Representing and Exchanging Knowledge about Actions, Objects, and Environments,  
IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA,  
May 14–18 2012.

[C9] Lars Kunze, Michael Beetz, Manabu Saito, Haseru Azuma, Kei Okada and Masayuki Inaba,  
Searching Objects in Large-scale Indoor Environments: A Decision-theoretic Approach,  
IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA,  
May 14–18 2012.

[C10] Ulrich Klank, Lorenz Mösenlechner, Alexis Maldonado and Michael Beetz,  
Robots that Validate Learned Perceptual Models,  
IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA,  
May 14–18 2012.

[C11] Ingo Kresse and Michael Beetz,  
Movement-aware Action Control – Integrating Symbolic and Control-theoretic Action Execution,  
IEEE International Conference on Robotics and Automation (ICRA), St. Paul, MN, USA,  
May 14–18 2012.

[C12] Moritz Tenorth and Michael Beetz,  
Knowledge Processing for Autonomous Robot Control,  
AAAI Spring Symposium on Designing Intelligent Robots: Reintegrating AI, Stanford, CA,  
USA, March 26–28 2012.

[C13] Michael Beetz, Moritz Tenorth, Dejan Pangercic and Benjamin Pitzer,  
Semantic Object Maps for Household Tasks,  

[C14] Michael Beetz, Lorenz Mösenlechner, Moritz Tenorth and Thomas Rühr,  
CRAM – a Cognitive Robot Abstract Machine,  
[C15] Ferenc Balint-Benczedi, Zoltan-Csaba Marton and Michael Beetz, 
Efficient Part-Graph Hashes for Object Categorization, 
5th International Conference on Cognitive Systems (CogSys), 2012.

[C16] Daniel di Marco, Moritz Tenorth, Kai Häussermann, Oliver Zweigle and Paul Levi, 
RoboEarth Action Recipe Execution, 

[C17] Moritz Tenorth and Michael Beetz, 
Exchange of Action-related Information among Autonomous Robots, 

[C18] Zoltan-Csaba Marton, Ferenc Balint-Benczedi, Florian Seidel, Lucian Cosmin Goron and 
Michael Beetz, 
Object Categorization in Clutter using Additive Features and Hashing of Part- 
graph Descriptors, 
Proceedings of Spatial Cognition (SC), Abbey Kloster Seeon, Germany, 2012.

[C19] David Gossow, David Weikersdorfer and Michael Beetz, 
Distinctive Texture Features from Perspective-Invariant Keypoints, 

[C20] David Weikersdorfer, David Gossow and Michael Beetz, 
Depth-Adaptive Superpixels, 

[C21] Christian Bersch, Dejan Pangercic, Sarah Osentoski, Karol Hausman, Zoltan-Csaba Mar- 
ton, Ryohei Ueda, Kei Okada and Michael Beetz, 
Segmentation of Textured and Textureless Objects through Interactive Per- 
ception, 
RSS Workshop on Robots in Clutter: Manipulation, Perception and Navigation in Human 
Environments, Sydney, Australia, July 9–13 2012.

[C22] Moritz Tenorth and Michael Beetz, 
A Unified Representation for Reasoning about Robot Actions, Processes, and 
their Effects on Objects, 

[C23] Daniel Nyga and Michael Beetz, 
Everything Robots Always Wanted to Know about Housework (But were 
afraid to ask), 

[C24] Dejan Pangercic, Moritz Tenorth, Benjamin Pitzer and Michael Beetz, 
Semantic Object Maps for Robotic Housework - Representation, Acquisition 
and Use, 

[C25] Alexis Maldonado, Humberto Alvarez-Heredia and Michael Beetz, 
Improving robot manipulation through fingertip perception, 
[C26] Lucian Cosmin Goron, Zoltan Csaba Marton, Gheorghe Lazea and Michael Beetz,  
Segmenting Cylindrical and Box-like Objects in Cluttered 3D Scenes,  
7th German Conference on Robotics (ROBOTIK), Munich, Germany, May 2012.

[C27] Zoltan-Csaba Marton, Florian Seidel and Michael Beetz,  
Towards Modular Spatio-temporal Perception for Task-adapting Robots,  
Postgraduate Conference on Robotics and Development of Cognition (RobotDoC-PhD),  
a satellite event of the 22nd International Conference on Artificial Neural Networks  
(ICANN), Lausanne, Switzerland, 2012.

[C28] Reinhard Klapfer, Lars Kunze and Michael Beetz,  
Pouring and Mixing Liquids — Understanding the Physical Effects of Everyday Robot Manipulation Actions,  
35th German Conference on Artificial Intelligence (KI-2012), Workshop on Human Reasoning and Automated Deduction, Saarbrücken, Germany, September 24–27 2012.

[C29] Lars Kunze, Andrei Haidu and Michael Beetz,  
Making Virtual Pancakes — Acquiring and Analyzing Data of Everyday Manipulation Tasks through Interactive Physics-based Simulations,  
Poster and Demo Track of the 35th German Conference on Artificial Intelligence (KI-2012), Saarbrücken, Germany, September 24–27 2012.

The SHERPA project: smart collaboration between humans and ground-aerial robots for improving rescuing activities in alpine environments,  
IEEE International Symposium on Safety, Security, and Rescue Robotics (SSRR), College Station, Texas, USA, Nov. 5-8 2012.

[C31] Vladyslav Usenko, Florian Seidel, Zoltan-Csaba Marton and Dejan Pangeric Michael Beetz,  
Furniture Classification using WWW CAD Models,  
IROS12 Workshop on Active Semantic Perception (ASP12), Vilamoura, Portugal, October 7 2012.

[C32] Moritz Tenorth, Koji Kamei, Satoru Satake, Takahiro Miyashita and Norihiro Hagita,  
Towards a Networked Robot Architecture for Distributed Task Execution and Knowledge Exchange,  
Third International Workshop on Standards and Common Platforms for Robotics (SCPR 2012), in conjunction with SIMPAR 2012, Tsukuba, Japan, November 5 2012.

[PhD1] Dominik Jain,  
Probabilistic Cognition for Technical Systems: Statistical Relational Models for High-Level Knowledge Representation, Learning and Reasoning,  
Technische Universität München, 2012.

[PhD2] Ulrich Klank,  
Everyday Perception for Mobile Manipulation in Human Environments,  
Technische Universität München, 2012.
[J1] Séverin Lemaignan, Raquel Ros, E. Akin Sisbot, Rachid Alami and Michael Beetz,  
*Grounding the Interaction: Anchoring Situated Discourse in Everyday Human-Robot Interaction*,  

[J2] Moritz Tenorth, Ulrich Klank, Dejan Pangercic and Michael Beetz,  
*Web-enabled Robots – Robots that Use the Web as an Information Resource*,  

[J3] Markus Waibel, Michael Beetz, Raffaello D’Andrea, Rob Janssen, Moritz Tenorth, Javier Civera, Jos Elfring, Dorian Gálvez-López, Kai Häussermann, J.M.M. Montiel, Alexander Perzylo, Björn Schießle, Oliver Zweigle and René van de Molengraft,  
*RoboEarth - A World Wide Web for Robots*,  

[J4] Oscar Martinez Mozos, Zoltan Csaba Marton and Michael Beetz,  
*Furniture Models Learned from the WWW – Using Web Catalogs to Locate and Categorize Unknown Furniture Pieces in 3D Laser Scans*,  

[J5] Zoltan Csaba Marton, Dejan Pangercic, Nico Blodow and Michael Beetz,  
*Combined 2D-3D Categorization and Classification for Multimodal Perception Systems*,  

[C1] Federico Ruiz-Ugalde, Gordon Cheng and Michael Beetz,  
*Fast adaptation for effect-aware pushing*,  

[C2] Sebastian Albrecht, Karinne Ramirez-Amaro, Federico Ruiz-Ugalde, David Weikersdorfer, Marion Leibold, Michael Ulbrich and Michael Beetz,  
*Imitating human reaching motions using physically inspired optimization principles*,  

[C3] Lars Kunze, Mihai Emanuel Dolha, Emitza Guzman and Michael Beetz,  
*Simulation-based Temporal Projection of Everyday Robot Object Manipulation*,  
Yolum, Tumer, Stone and Sonenberg(Eds.), *Proc. of the 10th Int. Conf. on Autonomous Agents and Multiagent Systems (AAMAS 2011)*, Taipei, Taiwan, IFAAMAS, May, 2–6 2011.

[C4] Lars Kunze, Tobias Roehm and Michael Beetz,  
*Towards Semantic Robot Description Languages*,  

[C5] Daniel Nyga, Moritz Tenorth and Michael Beetz,  
*How-Models of Human Reaching Movements in the Context of Everyday Manipulation Activities*,  
[C6] Ulrich Klank, Daniel Carton and Michael Beetz,

**Transparent Object Detection and Reconstruction on a Mobile Platform,**


[C7] Michael Beetz, Ulrich Klank, Alexis Maldonado, Dejan Pangercic and Thomas Rühr,

**Robotic Roommates Making Pancakes - Look Into Perception-Manipulation Loop,**


[C8] Nico Blodow, Zoltan-Csaba Marton, Dejan Pangercic, Thomas Rühr, Moritz Tenorth and Michael Beetz,

**Inferring Generalized Pick-and-Place Tasks from Pointing Gestures,**


[C9] Nico Blodow, Lucian Cosmin Goron, Zoltan-Csaba Marton, Dejan Pangercic, Thomas Rühr, Moritz Tenorth and Michael Beetz,

**Autonomous Semantic Mapping for Robots Performing Everyday Manipulation Tasks in Kitchen Environments,**


[C10] Lars Kunze, Mihai Emanuel Dolha and Michael Beetz,

**Logic Programming with Simulation-based Temporal Projection for Everyday Robot Object Manipulation,**


[C11] Zoltan-Csaba Marton, Nico Blodow and Michael Beetz,

**Advantages of Spatial-temporal Object Maps for Service Robotics,**

*IEEE Workshop on Advanced Robotics and its Social Impacts (ARSO)*, Half-Moon Bay, CA, USA, October 2-4 2011.

[C12] Dominik Jain, Klaus von Gleissenthall and Michael Beetz,

**Bayesian Logic Networks and the Search for Samples with Backward Simulation and Abstract Constraint Learning,**


[C13] Paul Maier, Dominik Jain and Martin Sachenbacher,

**Compiling AI Engineering Models for Probabilistic Inference,**


[C14] Dominik Jain,

**Knowledge Engineering with Markov Logic Networks: A Review,**

*DKB 2011: Proceedings of the Third Workshop on Dynamics of Knowledge and Belief*, 2011.
[C15] Lorenz Mösenlechner and Michael Beetz,
Parameterizing Actions to have the Appropriate Effects,

[C16] Shulei Zhu, Dejan Pangercic and Michael Beetz,
Contracting Curve Density Algorithm for Applications in Personal Robotics,

[C17] Michael Beetz, Ulrich Klank, Ingo Kresse, Alexis Maldonado, Lorenz Mösenlechner, Dejan Pangercic, Thomas Rühr and Moritz Tenorth,
Robotic Roommates Making Pancakes,

[C18] Ingo Kresse, Ulrich Klank and Michael Beetz,
Multimodal Autonomous Tool Analyses and Appropriate Application,

[C19] Manabu Saito, Haseru Chen, Kei Okada, Masayuki Inaba, Lars Kunze and Michael Beetz,
Semantic Object Search in Large-scale Indoor Environments,

[C20] Dejan Pangercic, Vladimir Haltakov and Michael Beetz,
Fast and Robust Object Detection in Household Environments Using Vocabulary Trees with SIFT Descriptors,

[C21] Asako Kanezaki, Zoltan-Csaba Marton, Dejan Pangercic, Tatsuya Harada, Yasuo Kuniyoshi and Michael Beetz,
Voxelized Shape and Color Histograms for RGB-D,

[C22] Zoltan-Csaba Marton, Dejan Pangercic and Michael Beetz,
Efficient Surface and Feature Estimation in RGBD,

[C23] William R. Murray and Dominik Jain,
Modeling Cognitive Frames for Situations with Markov Logic Networks,
[C24] Christoph Mayer and Bernd Radig,
Learning Displacement Experts from Multi-band Images for Face Model Fitting,

[C25] Barbara Gonsior, Stefan Sosnowski, Christoph Mayer, Jürgen Blume, Bernd Radig, Dirk Wollherr, and Kolja Kühnlenz,
Improving Aspects of Empathy and Subjective Performance for HRI through Mirroring Facial Expressions,

[C26] Maier, Paul, Jain, Dominik, Sachenbacher and Martin,
Diagnostic Hypothesis Enumeration vs. Probabilistic Inference for Hierarchical Automata Models,

[C27] Aitor Aldoma, Markus Vincze, Nico Blodow, David Gossow, Suat Gedikli, Radu Bogdan Rusu and Gary R. Bradski,
CAD-model recognition and 6DOF pose estimation using 3D cues,
*IEEE International Conference on Computer Vision Workshops, ICCV 2011 Workshops, Barcelona, Spain, November 6-13, 2011*, 585-592, 2011.

[PhD1] von Hoyningen-Huene and Nicolai,
Real-time Tracking of Player Identities in Team Sports,
Technische Universität München, 2011.

[PhD2] Jan Bandouch,
Observing and Interpreting Complex Human Activities in Everyday Environments,
Technische Universität München, 2011.

[PhD3] Moritz Tenorth,
Knowledge Processing for Autonomous Robots,
Technische Universität München, 2011.

[J1] Michael Beetz, Freek Stulp, Piotr Esden-Tempski, Andreas Fedrizzi, Ulrich Klank, Ingo Kresse, Alexis Maldonado and Federico Ruiz,
Generality and Legibility in Mobile Manipulation,

[J2] Wykowska, Agnieszka, Maldonado, Alexis, Beetz, Michael, Schuboe and Anna,
How Humans Optimize Their Interaction with the Environment: The Impact of Action Context on Human Perception,

[J3] Michael Beetz, Moritz Tenorth, Dominik Jain and Jan Bandouch,
Towards Automated Models of Activities of Daily Life,
[J4] Michael Beetz, Dominik Jain, Lorenz Müsenlechner and Moritz Tenorth,
Towards Performing Everyday Manipulation Activities,

[J5] Michael Beetz, Martin Buss and Bernd Radig,
Learning from Humans – Cognition-enabled Computational Models of Everyday Activity,
Künstliche Intelligenz, 2010.

[J6] Martin Buss and Michael Beetz,
CoTeSys – Cognition for Technical Systems,
Künstliche Intelligenz, 2010.

[J7] Moritz Tenorth, Dominik Jain and Michael Beetz,
Knowledge Representation for Cognitive Robots,

[J8] Freek Stulp, Hans Utz, Michael Isik and Gerd Mayer,
Implicit Coordination with Shared Belief: A Heterogeneous Robot Soccer Team Case Study,

[J9] Michael Beetz and Alexandra Kirsch,
Special Issue on Cognition for Technical Systems,
Künstliche Intelligenz, 24: 2010.

[J10] Alexandra Kirsch, Thibault Kruse, E. Akin Sisbot, Rachid Alami, Martin Lawitzky, Dražen Bršić, Sandra Hirche, Patrizia Basili and Stefan Glasauer,
Plan-based Control of Joint Human-Robot Activities,

Artificial Cognition in Production Systems,

[BC1] Nicolai v. Hoyningen-Huene and Michael Beetz,
Importance Sampling as One Solution to the Data Association Problem in Multi-target Tracking,

[C1] Moritz Tenorth, Daniel Nyga and Michael Beetz,
Understanding and Executing Instructions for Everyday Manipulation Tasks from the World Wide Web,
[C2] Moritz Tenorth and Michael Beetz,
Priming Transformational Planning with Observations of Human Activities,

[C3] Thibault Kruse, Alexandra Kirsch, E. Akin Sisbot and Rachid Alami,
Dynamic Generation and Execution of Human Aware Navigation Plans,

[C4] Dominik Jain, Andreas Barthels and Michael Beetz,
Adaptive Markov Logic Networks: Learning Statistical Relational Models with Dynamic Parameters,

[C5] S. Sosnowski, C. Mayer, K. Kühlenz and B. Radig,
Mirror my emotions! Combining facial expression analysis and synthesis on a robot,

[C6] Frank Wallhoff, Tobias Rehrl, Christoph Mayer and Bernd Radig,
Real-Time Face and Gesture Analysis for Human-Robot Interaction,

[C7] Alexandra Kirsch and Fan Cheng,
Learning Ability Models for Human-Robot Collaboration,

[C8] Dominik Jain and Michael Beetz,
Soft Evidential Update via Markov Chain Monte Carlo Inference,

[C9] Paul Maier, Dominik Jain, Stefan Waldherr and Martin Sachenbacher,
Plan Assessment for Autonomous Manufacturing as Bayesian Inference,

[C10] Nico Blodow, Zoltan-Csaba Marton, Dejan Pangercic and Michael Beetz,
Making Sense of 3D Data,

[C11] Zoltan-Csaba Marton, Dejan Pangercic, Nico Blodow, Jonathan Kleinehellefort and Michael Beetz,
General 3D Modelling of Novel Objects from a Single View,

[C12] Dejan Pangercic, Moritz Tenorth, Dominik Jain and Michael Beetz,
Combining Perception and Knowledge Processing for Everyday Manipulation,
[C13] Michael Beetz, Lorenz Mösenelechner and Moritz Tenorth,
CRAM – A Cognitive Robot Abstract Machine for Everyday Manipulation in
Human Environments,
IEEE/RSJ International Conference on Intelligent Robots and Systems, Taipei, Taiwan,
1012-1017, October 18-22 2010.

[C14] Lorenz Mösenelechner, Nikolaus Demmel and Michael Beetz,
Becoming Action-aware through Reasoning about Logged Plan Execution Tra-
ces,
IEEE/RSJ International Conference on Intelligent RObots and Systems., Taipei, Taiwan,
2231-2236, October 18-22 2010.

[C15] Thibault Kruse, Alexandra Kirsch, E. Akin Sisbot and Rachid Alami,
Exploiting Human Cooperation in Human-Centered Robot Navigation,
IEEE International Symposium in Robot and Human Interactive Communication (Ro-
Man), 2010.

[C16] Federico Ruiz-Ugalde, Gordon Cheng and Michael Beetz,
Prediction of action outcomes using an object model,
2010 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Tai-
pe, Taiwan, October 18-22 2010.

[C17] Alexis Maldonado, Ulrich Klank and Michael Beetz,
Robotic grasping of unmodeled objects using time-of-flight range data and fin-
ger torque information,
2010 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Tai-
pe, Taiwan, 2586-2591, October 18-22 2010.

[C18] Lars Kunze, Moritz Tenorth and Michael Beetz,
Putting People's Common Sense into Knowledge Bases of Household Robots,
33rd Annual German Conference on Artificial Intelligence (KI 2010), Karlsruhe, Germany,

[C19] Alexandra Kirsch and Yuxiang Chen,
A Testbed for Adaptive Human-Robot Collaboration,
33rd Annual German Conference on Artificial Intelligence (KI 2010), 2010.

[C20] Thibault Kruse and Alexandra Kirsch,
Towards Opportunistic Action Selection in Human-Robot Cooperation,
33rd Annual German Conference on Artificial Intelligence (KI 2010), 2010.

[C21] Zoltan-Csaba Marton, Dejan Pangercic, Radu Bogdan Rusu, Andreas Holzbach and Mi-
chael Beetz,
Hierarchical Object Geometric Categorization and Appearance Classification
for Mobile Manipulation,
Proceedings of the IEEE-RAS International Conference on Humanoid Robots, Nashville,
TN, USA, December 6-8 2010.

[C22] Nico Blodow, Dominik Jain, Zoltan-Csaba Marton and Michael Beetz,
Perception and Probabilistic Anchoring for Dynamic World State Logging,
10th IEEE-RAS International Conference on Humanoid Robots, Nashville, TN, USA, 160-
166, December 6-8 2010.
[C23] Moritz Tenorth, Lars Kunze, Dominik Jain and Michael Beetz,
**KNOWROB-MAP — Knowledge-Linked Semantic Object Maps**, 

[C24] Séverin Lemaignan, Raquel Ros, Lorenz Mösenlechner, Rachid Alami and Michael Beetz,
**ORO, a knowledge management module for cognitive architectures in robotics**, 

[C25] C. Mayer, S. Sosnowski, K. Kühnlenz and B. Radig,
**Towards robotic facial mimicry: system development and evaluation**, 

[C26] Lucian Cosmin Goron, Zoltan Csaba Marton, Gheorghe Lazea and Michael Beetz,
**Automatic Layered 3D Reconstruction of Simplified Object Models for Grasping**, 
*Joint 41st International Symposium on Robotics (ISR) and 6th German Conference on Robotics (ROBOTIK)*, Munich, Germany, 2010.

**A Distributed Many-Camera System for Multi-Person Tracking**, 
R. Wichert and B. de Ruyter(Eds.), *Proceedings of the First International Joint Conference on Ambient Intelligence (AmI 2010)*, Springer Lecture Notes in Computer Science, November 2010.

[R1] Alexandra Kirsch,
**Be a Robot — A Study on Everyday Activities Performed in Real and Virtual Worlds**, 
TUM-I1006, Technische Universität München, 2010.

**Multi Joint Action in CoTeSys — Setup and Challenges**, 
CoTeSys-TR-10-01, CoTeSys Cluster of Excelence: Technische Universität München &38; Ludwig-Maximilians-Universität München, Munich, Germany, June 2010.

[R3] Moritz Tenorth and Michael Beetz,
**Deliverable D5.2: The RoboEarth Language — Language Specification**, 

[J1] Radu Bogdan Rusu, Aravind Sundaresan, Benoit Morisset, Kris Hauser, Motilal Agrawal, Jean-Claude Latombe and Michael Beetz,
**Leaving Flatland: Efficient Real-Time 3D Navigation**, 
[J2] Michael Beetz, Nicolai von Hoyningen-Huene, Bernhard Kirchlechner, Suat Gedikli, Francisco Siles, Murat Durus and Martin Lames, 
*ASpOAMo: Automated Sports Game Analysis Models*,

[J3] Alexandra Kirsch, 
*Robot Learning Language – Integrating Programming and Learning for Cognitive Systems*,

[J4] Radu Bogdan Rusu, Jan Bandouch, Franziska Meier, Irfan Essa and Michael Beetz, 
*Human Action Recognition using Global Point Feature Histograms and Action Shapes*,

[J5] Christoph Mayer, Matthias Wimmer and Bernd Radig, 
*Adjusted Pixel Features for Facial Component Classification*,

[BC1] Wykowska, Agnieszka, Maldonado, Alexis, Beetz, Michael, Schuboe and Anna, 
*How Humans Optimize Their Interaction with the Environment: The Impact of Action Context on Human Perception*,

*The Cognitive Factory*,

[C1] Freek Stulp, Erhan Oztop, Peter Pastor, Michael Beetz and Stefan Schaal, 
*Compact Models of Motor Primitive Variations for Predictable Reaching and Obstacle Avoidance*,

[C2] Freek Stulp, Andreas Fedrizzi, Franziska Zacharias, Moritz Tenorth, Jan Bandouch and Michael Beetz, 
*Combining Analysis, Imitation, and Experience-based Learning to Acquire a Concept of Reachability*,

[C3] Ulrich Klank, Dejan Pangercic, Radu Bogdan Rusu and Michael Beetz, 
*Real-time CAD Model Matching for Mobile Manipulation and Grasping*,
[C4] Zoltan Csaba Marton, Radu Bogdan Rusu, Dominik Jain, Ulrich Klank and Michael Beetz, 
Probabilistic Categorization of Kitchen Objects in Table Settings with a Composite Sensor, 
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), St. Louis, 
MO, USA, 4777-4784, October 11-15 2009.

[C5] Radu Bogdan Rusu, Ioan AlexandruSucan, Brian Gerkey, Sachin Chitta, Michael Beetz 
and Lydia E. Kavraki, 
Real-time Perception-Guided Motion Planning for a Personal Robot, 
Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems 
(IROS), St. Louis, MO, USA, 4245-4252, October 11-15 2009.

[C6] Radu Bogdan Rusu, Zoltan Csaba Marton, Nico Blodow, Andreas Holzbach and Michael 
Beetz, 
Model-based and Learned Semantic Object Labeling in 3D Point Cloud Maps 
of Kitchen Environments, 
Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems 
(IROS), St. Louis, MO, USA, October 11-15 2009.

[C7] Radu Bogdan Rusu, Nico Blodow, Zoltan Csaba Marton and Michael Beetz, 
Close-range Scene Segmentation and Reconstruction of 3D Point Cloud Maps 
for Mobile Manipulation in Human Environments, 
Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems 
(IROS), St. Louis, MO, USA, October 11-15 2009.

[C8] Radu Bogdan Rusu, Andreas Holzbach, Nico Blodow and Michael Beetz, 
Fast Geometric Point Labeling using Conditional Random Fields, 
Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems 
(IROS), St. Louis, MO, USA, October 11-15 2009.

[C9] Christoph Ertelt, Thomas Rühr, Dejan Pangercic, Kristina Shea and Michael Beetz, 
Integration of Perception, Global Planning and Local Planning in the Manufacturing Domain, 

[C10] Freek Stulp, Andreas Fedrizzi and Michael Beetz, 
Action-Related Place-Based Mobile Manipulation, 
Proceedings of the International Conference on Intelligent Robots and Systems (IROS), 

[C11] Florian Friesdorf, Dejan Pangercic, Heiner Bubb and Michael Beetz, 
Mutually Augmented Cognition, 
Proceedings of the International Conference on Social Robotics (ICSR), 2009.

[C12] Radu Bogdan Rusu, Wim Meeussen, Sachin Chitta and Michael Beetz, 
Laser-based Perception for Door and Handle Identification, 
Proceedings of the International Conference on Advanced Robotics (ICAR), Munich, June 
22-26 2009.

[C13] Dejan Pangercic, Rok Tavcar, Moritz Tenorth and Michael Beetz, 
Visual Scene Detection and Interpretation using Encyclopedic Knowledge and Formal Description Logic, 
Proceedings of the International Conference on Advanced Robotics (ICAR), Munich, Germany, June 22 - 26 2009.
[C14] Andreas Fedrizzi, Lorenz Moesenlechner, Freek Stulp and Michael Beetz,
Transformational Planning for Mobile Manipulation based on Action-related
Places,

[C15] Freek Stulp, Andreas Fedrizzi and Michael Beetz,
Learning and Performing Place-based Mobile Manipulation,
Proceedings of the 8th International Conference on Development and Learning (ICDL),
1-7, 2009.

[C16] Freek Stulp, Ingo Kresse, Alexis Maldonado, Federico Ruiz, Andreas Fedrizzi and Michael
Beetz,
Compact Models of Human Reaching Motions for Robotic Control in Everyday
Manipulation Tasks,
Proceedings of the 8th International Conference on Development and Learning (ICDL),
2009.

[C17] Benoit Morisset, Radu Bogdan Rusu, Aravind Sundaresan, Kris Hauser, Motilal Agrawal,
Jean-Claude Latombe and Michael Beetz,
Leaving Flatland: Toward Real-Time 3D Navigation,
Proceedings of the IEEE International Conference on Robotics and Automation (ICRA),
Kobe, Japan, May 12-17, 2009.

[C18] Radu Bogdan Rusu, Nico Blodow and Michael Beetz,
Fast Point Feature Histograms (FPFH) for 3D Registration,
Proceedings of the IEEE International Conference on Robotics and Automation (ICRA),
Kobe, Japan, May 12-17, 2009.

[C19] Zoltan Csaba Marton, Radu Bogdan Rusu and Michael Beetz,
On Fast Surface Reconstruction Methods for Large and Noisy Point Clouds,
Proceedings of the IEEE International Conference on Robotics and Automation (ICRA),
Kobe, Japan, May 12-17 2009.

[C20] Morten Rufus Blas, Radu Bogdan Rusu, Mogens Blanke and Michael Beetz,
Fault-tolerant 3D Mapping with Application to an Orchard Robot,
Proceedings of the 7th IFAC International Symposium on Fault Detection, Supervision and
Safety of Technical Processes (SAFEPROCESS’09), Barcelona, Spain, June 30 - July 3,
2009.

[C21] Ulrich Klank, Muhammad Zeeshan Zia and Michael Beetz,
3D Model Selection from an Internet Database for Robotic Vision,

[C22] Dominik Jain, Lorenz Møsenlechner and Michael Beetz,
Equipping Robot Control Programs with First-Order Probabilistic Reasoning
Capabilities,

[C23] Nicolai von Hoyningen-Huene and Michael Beetz,
Rao-Blackwellized Resampling Particle Filter for Real-Time Player Tracking
in Sports,
AlpeshKumar Ranchordas and Helder Araujo(Eds.), Fourth International Conference on
Computer Vision Theory and Applications (VISAPP), Lisboa, Portugal, INSTICC press,
Computer Vision Group Munich

List of Publications

[C24] Andreas Andreakis, Nicolai von Hoyningen-Huene and Michael Beetz,
Incremental Unsupervised Time Series Analysis Using Merge Growing Neural
Gas,
José Carlos Príncipe and Risto Miikkulainen(Eds.), WSOMWSOM, Springer, Lecture No-

[C25] Nicolai von Hoyningen-Huene and Michael Beetz,
Robust real-time multiple target tracking,
Ninth Asian Conference on Computer Vision (ACCV), Xi’an, China, Sep. 2009.

[C26] Moritz Tenorth and Michael Beetz,
KnowRob – Knowledge Processing for Autonomous Personal Robots,

[C27] Muhammad Zeeshan Zia, Ulrich Klank and Michael Beetz,
Acquisition of a Dense 3D Model Database for Robotic Vision,
International Conference on Advanced Robotics (ICAR), 2009.

[C28] Lorenz Mösenlechner and Michael Beetz,
Using Physics- and Sensor-based Simulation for High-fidelity Temporal Pro-
jection of Realistic Robot Behavior,
19th International Conference on Automated Planning and Scheduling (ICAPS’09)., 2009.

[C29] Jan Bandouch and Michael Beetz,
Tracking Humans Interacting with the Environment Using Efficient Hierarchi-
cal Sampling and Layered Observation Models,
IEEE Int. Workshop on Human-Computer Interaction (HCI). In conjunction with IC-

[C30] Moritz Tenorth, Jan Bandouch and Michael Beetz,
The TUM Kitchen Data Set of Everyday Manipulation Activities for Motion
Tracking and Action Recognition,
IEEE International Workshop on Tracking Humans for the Evaluation of their Motion in

[C31] Michael Beetz, Jan Bandouch, Dominik Jain and Moritz Tenorth,
Towards Automated Models of Activities of Daily Life,
First International Symposium on Quality of Life Technology – Intelligent Systems for

[C32] Dominik Jain, Paul Maier and Gregor Wylezich,
Markov Logic as a Modelling Language for Weighted Constraint Satisfaction
Problems,
Eighth International Workshop on Constraint Modelling and Reformulation, in conjunc-

[C33] Andreas Leha, Dejan Pandercic, Thomas Rühr and Michael Beetz,
Optimization of Simulated Production Process Performance using Machine
Learning,

[C35] Maier, Paul, Sachenbacher, Martin, Rühr, Thomas, Kuhn and Lukas, Integrating Model-based Diagnosis and Prognosis in Autonomous Production, Proc. First International Conference on Prognostics and Health Management (PHM’09), San Diego, CA, USA, September 2009.


[C43] Alexandra Kirsch, Thibault Kruse and Lorenz Mösenlechner, 
An Integrated Planning and Learning Framework for Human-Robot Interaction, 
4th Workshop on Planning and Plan Execution for Real-World Systems (held in conjunction with ICAPS 09), 2009.

[C44] Zoltan Csaba Marton, Lucian Cosmin Goron, Radu Bogdan Rusu and Michael Beetz, 
Reconstruction and Verification of 3D Object Models for Grasping, 
Proceedings of the 14th International Symposium on Robotics Research (ISRR09), Lucerne, Switzerland, August 31 – September 3 2009.

[C45] Radu Bogdan Rusu, Andreas Holzbach, Gary Bradski and Michael Beetz, 
Detecting and Segmenting Objects for Mobile Manipulation, 
Proceedings of IEEE Workshop on Search in 3D and Video (S3DV), held in conjunction with the 12th IEEE International Conference on Computer Vision (ICCV), Kyoto, Japan, September 27 2009.

[C46] Nico Blodow, Radu Bogdan Rusu, Zoltan Csaba Marton and Michael Beetz, 
Partial View Modeling and Validation in 3D Laser Scans for Grasping, 

[C47] Radu Bogdan Rusu, Andreas Holzbach, Rosen Diankov, Gary Bradski and Michael Beetz, 
Perception for Mobile Manipulation and Grasping using Active Stereo, 

[C48] Michael Beetz, Nico Blodow, Ulrich Klank, Zoltan Csaba Marton, Dejan Pangercic and Radu Bogdan Rusu, 
CoP-Man – Perception for Mobile Pick-and-Place in Human Living Environments, 

[C49] Jun Li, Alexis Maldonado, Michael Beetz and Anna Schuboe, 
Obstacle avoidance in a pick-and-place task, 

[C50] Agnieszka Wykowska, Alexis Maldonado, Michael Beetz and Anna Schuboe, 
How humans optimize their interaction with the environment: The impact of action context on human perception., 

[C51] Florian Engstler, Jan Bandouch and Heiner Bubb, 
MeMoMan - Model Based Markerless Capturing of Human Motion, 
The 17th World Congress on Ergonomics (International Ergonomics Association, IEA), Beijing, China, 2009.

[C52] Zahid Riaz, Christoph Mayer, Matthias Wimmer, Michael Beetz and Bernd Radig, 
A Model Based approach for Expression Invariant Face Recognition, 
[C53] Zahid Riaz, Christoph Mayer, Michael Beetz and Bernd Radig,
Facial Expressions Recognition from Image Sequences,

[C54] Zahid Riaz, Christoph Mayer, Michael Beetz and Bernd Radig,
Model Based Analysis of Face Images for Facial Feature Extraction,

[C55] Christoph Mayer, Matthias Wimmer, Martin Eggers and Bernd Radig,
Facial Expression Recognition with 3D Deformable Models,

[C56] Zahid Riaz, Michael Beetz and Bernd Radig,
Image Normalization for Face Recognition using 3D Model,

[C57] Zahid Riaz, Christoph Mayer, Michael Beetz and Bernd Radig,
3D Model for Face Recognition across Facial Expressions,

[C58] Zahid Riaz, Suat Gedikli, Michael Beetz and Bernd Radig,
A Unified Features Approach to Human Face Image Analysis and Interpretation,

[C59] Zahid Riaz, Christoph Mayer, Saquib Sarfraz, Michael Beetz and Bernd Radig,
Multi-Feature Fusion in Advanced Robotics Applications,

[C60] M.S. Sarfraz, A. Saeed, M.H. Khan and Zahid Riaz,
Bayesian Prior Models for Vehicle Make and Model Recognition,

[C61] Jürgen Gast, Alexander Bannat, Tobias Rehrl, Christoph Mayer, Frank Wallhoff, Gerhard Rigoll and Bernd Radig,
Did I Get it Right: Head Gesture Analysis for Human-Machine Interaction,

[PhD1] Suat Gedikli,
Continual and Robust Estimation of Camera Parameters in Broadcasted Sports Games,
Technische Universität München, 2009.

[PhD2] Rusu and Radu Bogdan,
Semantic 3D Object Maps for Everyday Manipulation in Human Living Environments,
Technische Universität München, 2009.
[R1] Moritz Tenorth, Daniel Nyga and Michael Beetz,
Understanding and Executing Instructions for Everyday Manipulation Tasks from the World Wide Web,
IAS group, Technische Universität München, Fakultät für Informatik, 2009.

[R2] Dominik Jain, Stefan Waldherr and Michael Beetz,
Bayesian Logic Networks,
IAS Group, Fakultät für Informatik, Technische Universität München, 2009.

[J1] Radu Bogdan Rusu, Zoltan Csaba Marton, Nico Blodow, Mihai Dolha and Michael Beetz,
Towards 3D Point Cloud Based Object Maps for Household Environments,

[J2] Freek Stulp and Michael Beetz,
Refining the execution of abstract actions with learned action models,
Journal of Artificial Intelligence Research (JAIR), 32: June 2008.

[J3] Freek Stulp and Michael Beetz,
Combining Declarative, Procedural and Predictive Knowledge to Generate and Execute Robot Plans Efficiently and Robustly,

[J4] Radu Bogdan Rusu, Brian Gerkey and Michael Beetz,
Robots in the kitchen: Exploiting ubiquitous sensing and actuation,

[J5] Ulrich Klank, N. Padoy, H. Feussner and N. Navab,
Automatic feature generation in endoscopic images,

[J6] Matthias Wimmer, Freek Stulp, Sylvia Pietzsch and Bernd Radig,
Learning Local Objective Functions for Robust Face Model Fitting,

[J7] Matthias Wimmer, Zahid Riaz, Christoph Mayer and Bernd Radig,
Recognizing Facial Expressions Using Model-based Image Interpretation,

[B1] Matthias Wimmer,
Future User Interfaces Enhanced by Facial Expression Recognition – Interpreting Human Faces with Model-based Techniques,
VDM, Verlag Dr. Müller March 2008.
[C1] Zoltan Csaba Marton, Nico Blodow, Mihai Dolha, Moritz Tenorth, Radu Bogdan Rusu and Michael Beetz, 
*Autonomous Mapping of Kitchen Environments and Applications*,

[C2] Radu Bogdan Rusu, Aravind Sundaresan, Benoit Morisset, Motilal Agrawal, Michael Beetz and Kurt Konolige,
*Realtime Extended 3D Reconstruction from Stereo for Navigation*,

[C3] Radu Bogdan Rusu, Zoltan Csaba Marton, Nico Blodow and Michael Beetz,
*Interpretation of Urban Scenes based on Geometric Features*,

[C4] Paul Maier and Martin Sachenbacher,
*Constraint Optimization and Abstraction for Embedded Intelligent Systems*,

[C5] Paul Maier,
*Adaptive Abstraction of Constraint-Based Models for Self-Diagnosis and Planning*,

[C6] Martin Sachenbacher and Stefan Schwoon,
*Model-based Testing Using Quantified CSPs: A Map*,

[C7] Stefan Heinz and Martin Sachenbacher,
*Using Model Counting to Find Optimal Distinguishing Tests*,
Proc. First International Workshop on Counting Problems in CSP and SAT, and other neighbouring problems (Counting’08), 2008.

[C8] Paul Maier and Martin Sachenbacher,
*Adaptive Domain Abstraction in a Soft-Constraint Message-Passing Algorithm*,

[C9] Martin Sachenbacher and Paul Maier,
*Test Strategy Generation using Quantified CSPs*,

[C10] Martin Sachenbacher and Stefan Schwoon,
*Model-based Test Generation Using Quantified CSPs*,
[C11] Radu Bogdan Rusu, Aravind Sundaresan, Benoit Morisset, Motilal Agrawal and Michael Beetz, 
Leaving Flatland: Realtime 3D Stereo Semantic Reconstruction, 

[C12] Radu Bogdan Rusu, Zoltan Csaba Marton, Nico Blodow and Michael Beetz, 
Learning Informative Point Classes for the Acquisition of Object Model Maps, 

The Assistive Kitchen – A Demonstration Scenario for Cognitive Technical Systems, 
IEEE 17th International Symposium on Robot and Human Interactive Communication (RO-MAN), Muenchen, Germany, 1-8, 2008.

[C14] Anna Schubö, Alexis Maldonado, Sonja Stork and Michael Beetz, 
Subsequent Actions Influence Motor Control Parameters of a Current Grasping Action, 
IEEE 17th International Symposium on Robot and Human Interactive Communication (RO-MAN), Muenchen, Germany, 2008.

[C15] Freek Stulp and Michael Beetz, 
Learning Predictive Knowledge to Optimize Robot Motor Control, 

[C16] Jan Bandouch, Florian Engstler and Michael Beetz, 
Evaluation of Hierarchical Sampling Strategies in 3D Human Pose Estimation, 

[C17] Jan Bandouch, Florian Engstler and Michael Beetz, 
Accurate Human Motion Capture Using an Ergonomics-Based Anthropometric Human Model, 
Proceedings of the Fifth International Conference on Articulated Motion and Deformable Objects (AMDO), 2008.

[C18] Radu Bogdan Rusu, Jan Bandouch, Zoltan Csaba Marton, Nico Blodow and Michael Beetz, 
Action Recognition in Intelligent Environments using Point Cloud Features Extracted from Silhouette Sequences, 
IEEE 17th International Symposium on Robot and Human Interactive Communication (RO-MAN), Muenchen, Germany, 2008.

[C19] Radu Bogdan Rusu, Zoltan Csaba Marton, Nico Blodow and Michael Beetz, 
Persistent Point Feature Histograms for 3D Point Clouds, 
[C20] Radu Bogdan Rusu, Zoltan Csaba Marton, Nico Blodow, Mihai Emanuel Dolha and Michael Beetz,
*Functional Object Mapping of Kitchen Environments*,

[C21] Radu Bogdan Rusu, Nico Blodow, Zoltan Csaba Marton and Michael Beetz,
*Aligning Point Cloud Views using Persistent Feature Histograms*,

[C22] Thomas Rühr, Dejan Pangeric and Michael Beetz,
*Structured Reactive Controllers and Transformational Planning for Manufacturing*,

[C23] Dejan Pangeric, Radu Bogdan Rusu and Michael Beetz,
*3D-Based Monocular SLAM for Mobile Agents Navigating in Indoor Environments*,

*An Integrated Approach to Realize the Cognitive Machine Shop*,

[C25] Moritz Tenorth and Michael Beetz,
*Towards Practical and Grounded Knowledge Representation Systems for Autonomous Household Robots*,

[C26] Dominik Jain, Lorenz Mösenelechner and Michael Beetz,
*Equipping Robot Control Programs with First-Order Probabilistic Reasoning Capabilities*,

[C27] Lorenz Mösenelechner, Armin Müller and Michael Beetz,
*High Performance Execution of Everyday Pick-and-Place Tasks by Integrating Transformation Planning and Reactive Execution*,

[C28] Matthias Wimmer, Christoph Mayer, Freek Stulp and Bernd Radig,
*Face Model Fitting based on Machine Learning from Multi-band Images of Facial Components*,
Workshop on Non-Rigid Shape Analysis and Deformable Image Alignment, held in conjunction with CVPR, Anchorage, AK, USA, June 2008.
[C29] Matthias Wimmer, Christoph Mayer, Sylvia Pietzsch and Bernd Radig, 
Tailoring Model-based Techniques for Facial Expression Interpretation, 
The First International Conference on Advances in Computer-Human Interacti- 
on (ACHI08), Sainte Luce, Martinique, February 2008.

[C30] Matthias Wimmer, Björn Schuller, Dejan Arsic, Bernd Radig and Gerhard Rigoll, 
Low-level Fusion of Audio and Video Feature for Multi-modal Emotion Recogni- 
tion, 
3rd International Conference on Computer Vision Theory and Applications (VISAPP), 

[C31] Sylvia Pietzsch, Matthias Wimmer, Freek Stulp and Bernd Radig, 
Face Model Fitting with Generic, Group-specific, and Person-specific Objective Functions, 
3rd International Conference on Computer Vision Theory and Applications (VISAPP), 

[C32] Matthias Wimmer, Bruce A. MacDonald, Dinuka Jayamuni and Arpit Yadav, 
Facial Expression Recognition for Human-robot Interaction – A Prototype, 
Reinhard Klette and Gerald Sommer(Eds.), 2nd Workshop Robot Vision. Lecture Notes in 
2008.

[C33] Björn Schuller, Matthias Wimmer, Lorenz Mösenlechner, Christian Kern and Gerhard 
Rigoll, 
Brute-Forcing Hierarchical Functionals for Paralinguistics: a Waste of Feature Space?, 

[C34] Matthias Wimmer, Christoph Mayer and Bernd Radig, 
Robustly Classifying Facial Components Using a Set of Adjusted Pixel Features, 
Proc. of the International Conference on Face and Gesture Recognition (FGR08), 
Amsterdam, Netherlands, September 2008.

[C35] Matthias Wimmer, Shinya Fujie, Freek Stulp, Tetsuomi Kobayashi and Bernd Radig, 
An ASM Fitting Method Based on Machine Learning that Provides a Robust 
Parameter Initialization for AAM Fitting, 
Proc. of the International Conference on Automatic Face and Gesture Recognition (FGR08), 
Amsterdam, Netherlands, September 2008.

[C36] Christoph Mayer, Matthias Wimmer, Freek Stulp, Zahid Riaz, Anton Roth, Martin Eggers 
and Bernd Radig, 
A Real Time System for Model-based Interpretation of the Dynamics of Facial Expressions, 
Proc. of the International Conference on Automatic Face and Gesture Recogniti- 
on (FGR08), Amsterdam, Netherlands, September 2008.

[C37] Matthias Wimmer, Christoph Mayer, Martin Eggers and Bernd Radig, 
Are You Happy with Your First Name?, 
Proceedings of the 3rd Workshop on Emotion and Computing: Current Research and Future 
Impact, Kaiserslautern, Germany, 23-29, September 2008.
[C38] Christoph Mayer, Matthias Wimmer, Freek Stulp, Zahid Riaz, Anton Roth, Martin Eggers and Bernd Radig,
Interpreting the Dynamics of Facial Expressions in Real Time Using Model-based Techniques,

[C39] Björn Schuller, Matthias Wimmer, Dejan Arsic, Tobias Moosmayr and Gerhard Rigoll,
Detection of Security Related Affect and Behaviour in Passenger Transport,
Proc. of the 9th INTERSPEECH, Brisbane, Australia, ISCA, ASSTA, September 2008.

[C40] Matthias Wimmer, Sylvia Pietzsch, Christoph Mayer and Bernd Radig,
Robustly Estimating the Color of Facial Components Using a Set of Adjusted Pixel Features,

[C41] Matthias Wimmer, Christoph Mayer and Bernd Radig,
Recognizing Facial Expressions Using Model-based Image Interpretation,
Verbal and Nonverbal Communication Behaviours, COST Action 2102 International Workshop, Vietri sul Mare, Italy, , April 2008.

[C42] Zahid Riaz, Christoph Mayer, Matthias Wimmer and Bernd Radig,
Model Based Face Recognition Across Facial Expressions,

[C43] Zahid Riaz, Michael Beetz and Bernd Radig,
Shape Invariant Recognition of Segmented Human Faces using Eigenfaces,

[PhD1] Alexandra Kirsch,
Integration of Programming and Learning in a Control Language for Autonomous Robots Performing Everyday Activities,
Technische Universität München, 2008.

[PhD2] Armin Müller,
Transformational Planning for Autonomous Household Robots using Libraries of Robust and Flexible Plans,
Technische Universität München, 2008.

[R1] Stefan Heinz and Martin Sachenbacher,
Using Model Counting to Find Optimal Distinguishing Tests,

[J1] Martin Buss, Michael Beetz and Dirk Wollherr,
CoTeSys — Cognition for Technical Systems,
KI 2007: Advances in Artificial Intelligence,
Joachim Hertzberg, Michael Beetz and Roman Englert(Eds.), Springer-Verlag August 2007.

Nicolai v. Hoyningen-Huene, Bernhard Kirchlechner and Michael Beetz,
GrAM: Reasoning with Grounded Action Models by Combining Knowledge Representation and Data Mining,

Freek Stulp, Wolfram Koska, Alexis Maldonado and Michael Beetz,
Seamless Execution of Action Sequences,

Michael Beetz, Suat Gedikli, Jan Bandouch, Bernhard Kirchlechner, Nico von Hoyningen-Huene and Alexander Perzylo,
Visually Tracking Football Games Based on TV Broadcasts,
Proceedings of the Twentieth International Joint Conference on Artificial Intelligence (IJCAI), 2007.

Suat Gedikli, Jan Bandouch, Nico von Hoyningen-Huene, Bernhard Kirchlechner and Michael Beetz,
An Adaptive Vision System for Tracking Soccer Players from Variable Camera Settings,

Matthias Kranz, Alexis Maldonado, Benedikt Hoernler, Radu Bogdan Rusu, Michael Beetz, Gerhard Rigoll and Albrecht Schmidt,
A Knife and a Cutting Board as Implicit User Interface - Towards Context-Aware Kitchen Utilities,

Matthias Kranz, Alexis Maldonado, Radu Bogdan Rusu, Benedikt Hoernler, Gerhard Rigoll, Michael Beetz and Albrecht Schmidt,
Sensing Technologies and the Player-Middleware for Context-Awareness in Kitchen Environments,

Radu Bogdan Rusu, Alexis Maldonado, Michael Beetz and Brian Gerkey,
Extending Player/Stage/Gazebo towards Cognitive Robots Acting in Ubiquitous Sensor-equipped Environments,

Martin Buss, Michael Beetz and Dirk Wollherr,
CoTeSys — Cognition for Technical Systems,
[C9] Michael Beetz, Jan Bandouch, Alexandra Kirsch, Alexis Maldonado, Armin Müller and Radu Bogdan Rusu, 
The Assistive Kitchen — A Demonstration Scenario for Cognitive Technical Systems, 

[C10] Alexandra Kirsch and Michael Beetz, 
Training on the Job — Collecting Experience with Hierarchical Hybrid Automata, 

[C11] Armin Müller, Alexandra Kirsch and Michael Beetz, 
Transformational Planning for Everyday Activity, 

[C12] Armin Müller and Michael Beetz, 
Towards a Plan Library for Household Robots, 

[C13] Michael Beetz, Martin Buss and Dirk Wollherr, 
Cognitive Technical Systems — What Is the Role of Artificial Intelligence?, 

[C14] Radu Bogdan Rusu, Nico Blodow, Zoltan-Csaba Marton, Alina Soos and Michael Beetz, 
Towards 3D Object Maps for Autonomous Household Robots, 

[C15] Dominik Jain, Bernhard Kirchlechner and Michael Beetz, 
Extending Markov Logic to Model Probability Distributions in Relational Domains, 

[C16] Lars Kunze, Kai Lingemann, Andreas Nüchter and Joachim Hertzberg, 
Salient Visual Features to Help Close the Loop in 6D SLAM, 

[C17] Matthias Wimmer, Bernd Radig and Christoph Mayer, 
SIPBILD — Mimik- und Gestikerkennung in der Mensch-Maschine-Schnittstelle, 

[C18] Björn Schuller, Matthias Wimmer, Dejan Arsic, Gerhard Rigoll and Bernd Radig, 
Audiovisual Behavior Modeling by Combined Feature Spaces, 
[C19] Matthias Wimmer, Sylvia Pietzsch, Freek Stulp and Bernd Radig,
Learning Robust Objective Functions with Application to Face Model Fitting,

[C20] Matthias Wimmer and Bernd Radig,
Automatically Learning the Objective Function for Model Fitting,

[C21] Matthias Wimmer, Ursula Zucker and Bernd Radig,
Human Capabilities on Video-based Facial Expression Recognition,

[C22] Martin A. Tischler, Christian Peter, Matthias Wimmer and Jörg Voskamp,
Application of emotion recognition methods in automotive research,

[C23] Matthias Wimmer and Bernd Radig,
Initial Pose Estimation for 3D Models Using Learned Objective Functions,

[C24] Matthias Wimmer, Christoph Mayer, Freek Stulp and Bernd Radig,
Estimating Natural Activity by Fitting 3D Models via Learned Objective Functions,

Emotionale Aspekte in Produktevaluationen,

[C26] Matthias Wimmer, Freek Stulp and Bernd Radig,
Enabling Users to Guide the Design of Robust Model Fitting Algorithms,
Workshop on Interactive Computer Vision, held in conjunction with ICCV 2007, Rio de Janeiro, Brazil, Omnipress, 28, October 2007.

[PhD1] Freek Stulp,
Tailoring Robot Actions to Task Contexts using Action Models,
Technische Universität München, 2007.

[PhD2] Matthias Wimmer,
Model-based Image Interpretation with Application to Facial Expression Recognition,
Technische Universität München, Institute for Informatics, December 2007.
[J1] Radu Bogdan Rusu,
Acquiring Models of Everyday Activities for Robotic Control in 'Current PhD Research in Pervasive Computing',
A. Ferscha, M. Langheinrich and A. Schmidt(Eds.), Technical Reports - University of Munich, Department of Computer Science, Media Informatics Group, LMU-MI-2005-3: March 2006.

[J2] Matthias Wimmer and Bernd Radig,
Adaptive Skin Color Classifier,

[J3] Matthias Wimmer and Simone Hämmerle,
Bitte recht freundlich,

[C1] Radu Bogdan Rusu, Alexis Maldonado, Michael Beetz, Matthias Kranz, Lorenz Mösenlechner, Paul Holleis and Albrecht Schmidt,
Player/Stage as Middleware for Ubiquitous Computing,

[C2] Matthias Kranz, Radu Bogdan Rusu, Alexis Maldonado, Michael Beetz and Albrecht Schmidt,
A Player/Stage System for Context-Aware Intelligent Environments,

[C3] Freek Stulp, Mark Pfliiger and Michael Beetz,
Feature Space Generation using Equation Discovery,
Proceedings of the 29th German Conference on Artificial Intelligence (KI), 2006.

[C4] Michael Isik, Freek Stulp, Gerd Mayer and Hans Utz,
Coordination without Negotiation in Teams of Heterogeneous Robots,

[C5] Michael Beetz, Jan Bandouch, Suat Gedikli, Nico von Hoyningen-Huene, Bernhard Kirchlechner and Alexis Maldonado,
Camera-based Observation of Football Games for Analyzing Multi-agent Activities,

[C6] Freek Stulp, Michael Isik and Michael Beetz,
Implicit Coordination in Robotic Teams using Learned Prediction Models,

[C7] Freek Stulp and Michael Beetz,
Action Awareness – Enabling Agents to Optimize, Transform, and Coordinate Plans,
[C8] Armin Müller and Michael Beetz,
Designing and Implementing a Plan Library for a Simulated Household Robot,
Michael Beetz, Kanna Rajan, Michael Thielser and Radu Bogdan Rusu(Eds.), Cognitive
Robotics: Papers from the AAAI Workshop, Menlo Park, California, American Association

[C9] Markus Geipel and Michael Beetz,
Learning to shoot goals, Analysing the Learning Process and the Resulting
Policies,
Gerhard Lakemeyer, Elizabeth Sklar, Domenico Sorenti and Tomoichi Takahashi(Eds.),

[C10] Matthias Wimmer, Freek Stulp, Stephan Tschechne and Bernd Radig,
Learning Robust Objective Functions for Model Fitting in Image Understanding
Applications,
Michael J. Chantler, Emanuel Trucco and Robert B. Fisher(Eds.), Proceedings of the
17th British Machine Vision Conference (BMVC), Edinburgh, UK, BMVA, Vol. 3, 1159-

[C11] Matthias Wimmer, Bernd Radig and Michael Beetz,
A Person and Context Specific Approach for Skin Color Classification,
Proceedings of the 18th International Conference of Pattern Recognition (ICPR 2006), Los

[J1] Michael Beetz, Bernhard Kirchlechner and Martin Lames,
Computerized Real-Time Analysis of Football Games,

[J2] Michael Beetz and Henrik Grosskreutz,
Probabilistic Hybrid Action Models for Predicting Concurrent Percept-driven
Robot Behavior,

[BC1] Michael Beetz,
Towards Comprehensive Computational Models for Plan-Based Control of Auto-
nomous Robots,
Dieter Hutter and Werner Stephan(Ed.), Mechanizing Mathematical Reasoning: Essays in
Honor of Jörg H. Siekmann on the Occasion of His 60th Birthday, Springer LNCS 2605,
514-527, 2005.

[C1] Alexandra Kirsch and Michael Beetz,
Combining Learning and Programming for High-Performance Robot Controllers,
Tagungsband Autonome Mobile Systeme 2005, Springer Verlag, Reihe Informatik aktuell,
2005.

[C2] Alexandra Kirsch,
Towards High-performance Robot Plans with Grounded Action Models: Integrating Learning Mechanisms into Robot Control Languages,
[C3] Alexandra Kirsch, Michael Schweitzer and Michael Beetz,  
**Making Robot Learning Controllable: A Case Study in Robot Navigation**,  

[C4] Freek Stulp and Michael Beetz,  
**Optimized Execution of Action Chains Using Learned Performance Models of Abstract Actions**,  
Proceedings of the Nineteenth International Joint Conference on Artificial Intelligence (IJCAI), 2005.

[C5] Matthias Wimmer and Bernd Radig,  
**Adaptive Skin Color Classifier**,  

[C6] Simone Hämmerle, Matthias Wimmer, Bernd Radig and Michael Beetz,  
**Sensor-based Situated, Individualized, and Personalized Interaction in Smart Environments**,  

[J1] Robert Hanek and Michael Beetz,  

[J2] Michael Beetz, Thorsten Schmitt, Robert Hanek, Sebastian Buck, Freek Stulp, Derik Schröter and Bernd Radig,  
**The AGILO Robot Soccer Team – Experience-based Learning and Probabilistic Reasoning in Autonomous Robot Control**,  

[C1] Derik Schröter and Michael Beetz,  
**RG Mapping: Building Object-Oriented Representations of Structured Human Environments**,  
6-th Open Russian-German Workshop on Pattern Recognition and Image Understanding (OGRW), Katun/Russia, 2004.

[C2] Michael Beetz, Sven Flossmann and Thomas Stammeyer,  
**Motion and Episode Models for (Simulated) Football Games: Acquisition, Representation, and Use**,  

[C3] Michael Beetz, Alexandra Kirsch and Armin Müller,  
**RPL-LEARN: Extending an Autonomous Robot Control Language to Perform Experience-based Learning**,  
[C4] Armin Müller, Alexandra Kirsch and Michael Beetz, 
Object-oriented Model-based Extensions of Robot Control Languages, 
27th German Conference on Artificial Intelligence, 2004.

[C5] Freek Stulp, Alexandra Kirsch, Suat Gedikli and Michael Beetz, 
AGILO RoboCuppers 2004, 

[C6] Freek Stulp, Suat Gedikli and Michael Beetz, 
Evaluating Multi-Agent Robotic Systems Using Ground Truth, 
Proceedings of the Workshop on Methods and Technology for Empirical Evaluation of 

[C7] M. Beetz, F. Fischer, S. Flossmann, B. Kirchlechner, A. Unseld and C. Holzer, 
Watching Football with the Eyes of Experts: Integrated Intelligent Systems 
for the Automatic Analysis of (Simulated) Football Games, 

[C8] M. Beetz, B. Kirchlechner and F. Fischer, 
Interpretation and Processing of Position Data for the Empirical Study of the 
Behavior of Simulation League Robocup Teams, 

[C9] Hans Utz, Freek Stulp and Arndt Mühlenfeld, 
Sharing Belief in Teams of Heterogeneous Robots, 
Daniele Nardi, Martin Riedmiller and Claude Sammut(Eds.), RoboCup-2004: The Eighth 

[C10] D. Schröter and M. Beetz, 
Acquiring Modells of Rectangular Objects for Robot Maps, 
Proc. of IEEE International Conference on Robotics and Automation (ICRA), New Or- 

[C11] D. Schröter, T. Weber, M. Beetz and B. Radig, 
Detection and Classification of Gateways for the Acquisition of Structured 
Robot Maps, 

[C12] Stefan Fischer, Sven Döring, Matthias Wimmer and Antonia Krummheuer, 
Experiences with an Emotional Sales Agent, 
Elisabeth André, Laila Dybkjær, Wolfgang Minker and Paul Heisterkamp(Eds.), Affective 
Dialogue Systems, Kloster Irsee, Germany, Springer, Lecture Notes in Computer Science, 

[PhD1] Robert Hanek, 
Fitting Parametric Curve Models to Images Using Local Self-adapting Sepe- 
ration Criteria, 
Department of Informatics, Technische Universität München, 2004.

[PhD2] Thorsten Schmitt, 
Vision-based Probabilistic State Estimation for Cooperating autonomous Ro- 
bots, 
Department of Informatics, Technische Universität München, 2004.
[J1] Robert Hanek, Thorsten Schmitt, Sebastian Buck and Michael Beetz,
Towards RoboCup without color labeling,

[C1] Michael Beetz, Freek Stulp, Alexandra Kirsch, Armin Müller and Sebastian Buck,
Autonomous Robot Controllers Capable of Acquiring Repertoires of Complex
Skills,

[C2] Thorsten Schmitt and Michael Beetz,
Designing Probabilistic State Estimators for Autonomous Robot Control,

[C3] Thorsten Schmitt, Robert Hanek and Michael Beetz,
Developing Comprehensive State Estimators for Robot Soccer,

[C4] Michael Beetz, Suat Gedikli, Robert Hanek, Thorsten Schmitt and Freek Stulp,
AGILO RoboCuppers 2003: Computational Principles and Research Directions,

[PhD1] Sebastian Buck,
Experience-Based Control and Coordination of Autonomous Mobile Systems in Dynamic Environments,
Department of Informatics, Technische Universität München, 2003.

[J1] Thorsten Belker, Michael Beetz and Armin Cremers,
Learning Action Models for the Improved Execution of Navigation Plans,

[J2] Thorsten Schmitt, Robert Hanek, Michael Beetz, Sebastian Buck and Bernd Radig,
Cooperative Probabilistic State Estimation for Vision-based Autonomous Mobile Robots,

Discrete differential-geometry operators for triangulated 2-manifolds,

[B1] Michael Beetz,
Plan-based Control of Robotic Agents,

[B2] Michael Beetz, Joachim Hertzberg, Malik Ghallab and Martha Pollack,
Advances in Plan-based Control of Robotic Agents,
[BC1] Michael Beetz,
Towards integrated computational models for the plan-based control of robotic agents.,

[C1] Robert Hanek, Thorsten Schmitt, Sebastian Buck and Michael Beetz,
Towards RoboCup without Color Labeling,

[C2] Thorsten Schmitt, Michael Beetz, Robert Hanek and Sebastian Buck,
Watch their Moves: Applying Probabilistic Multiple Object Tracking to Autonomous Robot Soccer,
The Eighteenth National Conference on Artificial Intelligence, Edmonton, Canada, 2002.

[C3] Robert Hanek, Thorsten Schmitt, Sebastian Buck and Michael Beetz,
Fast Image-based Object Localization in Natural Scenes,

[C4] Michael Beetz, Sebastian Buck, Robert Hanek, Thorsten Schmitt and Bernd Radig,
The AGILO Autonomous Robot Soccer Team: Computational Principles, Experiences, and Perspectives,

[C5] Sebastian Buck, Michael Beetz and Thorsten Schmitt,
Approximating the Value Function for Continuous Space Reinforcement Learning in Robot Control,

[C6] Sebastian Buck, Michael Beetz and Thorsten Schmitt,
M-ROSE: A Multi Robot Simulation Environment for Learning Cooperative Behavior,

[C7] Sebastian Buck, Michael Beetz and Thorsten Schmitt,
Reliable Multi Robot Coordination Using Minimal Communication and Neural Prediction,

[C8] Sebastian Buck, Freek Stulp, Michael Beetz and Thorsten Schmitt,
Machine Control Using Radial Basis Value Functions and Inverse State Projection,


[PhD1] Christoph Hansen, Modellgetriebene Verfolgung formvariabler Objekte in Videobildfolgen, Department of Informatics, Technische Universität München, 2002.


[J1] Michael Beetz, Tom Arbuckle, Thorsten Belker, Maren Bennewitz, Armin Cremers, Dirk Hähnel and Dirk Schulz, 
**Enabling Autonomous Robots to Perform Complex Tasks**, 
*KI - Künstliche Intelligenz; Special Issue on Autonomous Robots*, 2000.

[J2] Sebastian Thrun, Michael Beetz, Maren Bennewitz, Armin Cremers, Frank Dellaert, Dieter Fox, Dirk Hähnel, Charles Rosenberg, Nicholas Roy, Jamieson Schulte and Dirk Schulz, 

[B1] Michael Beetz, 
**Concurrent Reactive Plans: Anticipating and Forestalling Execution Failures**, 

[C1] Robert Hanek and Thorsten Schmitt, 
**Vision-Based Localization and Data Fusion in a System of Cooperating Mobile Robots**, 

[C2] Robert Hanek, Thorsten Schmitt, Michael Klupsch and Sebastian Buck, 
**From Multiple Images to a Consistent View**, 
*The Fourth Robot World Cup Soccer Games and Conferences, RoboCup-2000 Melbourne*, 

[C3] Sebastian Buck and Martin Riedmiller, 
**Learning Situation Dependent Success Rates Of Actions In A RoboCup Scenario**, 

[C4] Sebastian Buck, Robert Hanek, Michael Klupsch and Thorsten Schmitt, 
**Agilo RoboCuppers: RoboCup Team Description**, 
*The Fourth Robot World Cup Soccer Games and Conferences, RoboCup-2000 Melbourne*, 
2000.

[C5] Rainer Malaka and Sebastian Buck, 
**Solving Nonlinear Optimization Problems Using Networks Of Spiking Neurons**, 

[C6] Michael Beetz and Thorsten Belker, 
**Environment and Task Adaptation for Robotic Agents**, 

[C7] Michael Beetz and Thorsten Belker, 
Ferryman(Ed.), *8th International Symposium on Intelligent Robotic Systems, SIRS 2000*, 
2000.
[C8] Michael Beetz, Jürgen Schumacher, Armin Cremers, Bernd Hellingrath and Christian Mazzocco,
Perspectives on Plan-based Multiagent Systems for Distributed Supply Chain Management in the Steel Industry,

[C9] Michael Beetz and Henrik Grosskreutz,
Probabilistic Hybrid Action Models for Predicting Concurrent Percept-driven Robot Behavior,

[C10] Michael Beetz,
Runtime Plan Adaptation in Structured Reactive Controllers,

[PhD1] Christof Ridder,
Interpretation von Videobildfolgen zur Beobachtung artikularer Bewegung von Personen anhand eines generischen 3D Objektmodells,

[PhD2] Michael Klupsch,
Objektorientierte Daten- und Zeitmodelle für die Echtzeit-Bildfolgenauswertung,

[PhD3] Michael Beetz,
Plan-based Control of Robotic Agents,
University of Bonn, 2000.

[C1] Thorsten Bandlow, Michael Klupsch, Robert Hanek and Thorsten Schmitt,
Fast Image Segmentation, Object Recognition and Localization in a RoboCup Scenario,

[C2] Thorsten Bandlow, Michael Klupsch, Robert Hanek and Thorsten Schmitt,
Agilo RoboCuppers: RoboCup Team Description,

[C3] Tom Arbuckle and Michael Beetz,
Controlling Image Processing: Providing Extensible, Run-time Configurable Functionality on Autonomous Robots,

[C4] Michael Beetz and Thorsten Belker,
Experience- and Model-based Transformational Learning of Symbolic Behavior Specifications,
[C5] T. Arbuckle and M. Beetz,
Extensible, Runtime-configurable Image Processing on Robots — the RECIPE system,

[C6] Michael Beetz, Maren Bennewitz and Henrik Grosskreutz,
Probabilistic, Prediction-based Schedule Debugging for Autonomous Robot Office Couriers,
Proceedings of the 23rd German Conference on Artificial Intelligence (KI 99), Bonn, Germany, Springer Verlag, 1999.

[C7] Michael Beetz,
Structured Reactive Controllers — A computational Model of Everyday Activity,

[C8] Michael Beetz, Markus Giesenschlag, Roman Englert, Eberhard Gülch and Armin Cremers,
Semi-automatic Acquisition of Symbolically-annotated 3D Models of Office Environments,

[J1] Michael Beetz, Wolfram Burgard, Dieter Fox and Armin Cremers,
Integrating Active Localization into High-level Control Systems,

[C1] M. Beetz and H. Grosskreutz,
Causal Models of Mobile Service Robot Behavior,

[C2] Michael Klupsch,
Object-Oriented Representation of Time-Varying Data Sequences in Multi-agent Systems,

[C3] Michael Klupsch, Maximilian Lückenhaus, Christoph Zierl, Ivan Laptev, Thorsten Bandlow, Marc Grimme, Ignaz Kellerer and Fabian Schwarzer,
Agilo RoboCuppers: RoboCup Team Description,

[C4] Tom Arbuckle and Michael Beetz,
RECIPE - A System for Building Extensible, Run-time Configurable, Image Processing Systems,
[C5] Michael Beetz and Maren Bennewitz,
Planning, Scheduling, and Plan Execution for Autonomous Robot Office Couriers,

[C6] Michael Beetz, Tom Arbuckle, Armin Cremers and Markus Mann,
Transparent, Flexible, and Resource-adaptive Image Processing for Autonomous Service Robots,

[C7] Michael Beetz and Hanno Peters,
Structured Reactive Communication Plans — Integrating Conversational Actions into High-level Robot Control Systems,
Proceedings of the 22nd German Conference on Artificial Intelligence (KI 98), Bremen, Germany, Springer Verlag, 1998.

[C1] M. Beetz and D. McDermott,
Expressing Transformations of Structured Reactive Plans,

[C2] M. Beetz and D. McDermott,
Fast Probabilistic Plan Debugging,

[PhD1] Stefan Lanzer,
Modellbasierte Lokalisation gestützt auf monokulare Videobilder,
Technische Universität München, 1997.

[C1] M. Beetz and D. McDermott,
Executing Structured Reactive Plans,
L. Pryor and S. Steel(Eds.), AAAI Fall Symposium: Issues in Plan Execution, 1996.

[C2] M. Beetz and D. McDermott,
Local Planning of Ongoing Activities,

[PhD1] M. Beetz,
Anticipating and Forestalling Execution Failures in Structured Reactive Plans,
Yale University, 1996.
[C1] M. Beetz and D. McDermott,
**Improving Robot Plans During Their Execution,**

[C1] M. Beetz and D. McDermott,
**Declarative Goals in Reactive Plans,**

[C1] R. Bertelsmeier and Bernd Radig,
**Kontextunterstützte Analyse von Szenen mit bewegten Objekten.,**