

Journal Articles

- [J1] R. Giubilato, M. Vayugundla, M. Schuster, W. Stürzl, A. Wedler, R. Triebel and S. Debei, **Relocalization With Submaps: Multi-Session Mapping for Planetary Rovers Equipped With Stereo Cameras**, *IEEE Robotics and Automation Letters*, 5(2): 580-587, 2020.
- [J2] P. Lutz, M. G. Müller, M. Maier, S. Stoneman, T. Tomic, I. von Bargaen, M. J. Schuster, F. Steidle, A. Wedler, W. Stürzl and R. Triebel, **ARDEAA n MAV with skills for future planetary missions**, *Journal of Field Robotics (JFR)*, 2020.
- [J3] M. Sundermeyer, Z. Marton, M. Durner and R. Triebel, **Augmented Autoencoders: Implicit 3D Orientation Learning for 6D Object Detection**, *International Journal of Computer Vision*, 2019.
- [J4] H. Grimmett, R. Triebel, R. Paul and I. Posner, **Introspective classification for robot perception**, *The International Journal of Robotics Research (IJRR)*, 2015.
- [J5] L. Spinello, R. Triebel and R. Siegwart, **Multiclass Multimodal Detection and Tracking in Urban Environments**, *International Journal of Robotics Research*, 2010.
- [J6] R. Kümmerle, R. Triebel, P. Pfaff and W. Burgard, **Monte Carlo localization in outdoor terrains using multilevel surface maps**, *Journal of Field Robotics*, 25(6-7): 346-359, 2008.
- [J7] O. M. Mozos, R. Triebel, P. Jensfelt, A. Rottmann and W. Burgard, **Supervised semantic labeling of places using information extracted from sensor data**, *Journal on Robotics and Autonomous Systems (RAS)*, 55(5): 391-402, 2007.
- [J8] P. Pfaff, R. Triebel and W. Burgard, **An Efficient Extension to Elevation Maps for Outdoor Terrain Mapping and Loop Closing**, *International Journal of Robotics Research (IJRR)*, 26(2): 217-230, 2007.
- [J9] H. Andreasson, R. Triebel and A. Lilienthal, **Non-iterative Vision-based Interpolation of 3D Laser Scans**, *Autonomous Robots and Agents*, 76: 83-90, 2007.

Conference and Workshop Papers

- [C1] A. Fontan-Villacampa, J. Civera and R. Triebel, **Information-Driven Direct RGB-D Odometry**, *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2020, **Oral Presentation**.

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- [C2] M. Sundermeyer, M. Durner, E. Y. Puang, Z.-C. Marton, N. Vaskevicius, K. O. Arras and R. Triebel,
Multi-path Learning for Object Pose Estimation Across Domains,
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020.
- [C3] J. Wenger, H. Kjellström and R. Triebel,
Non-Parametric Calibration for Classification,
International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.
- [C4] J. Lee, R. Balachandran, Y. Sarkisov, M. D Stefano, A. Coelho, K. Shinde, M. J. Kim, R. Triebel and K. Kondak,
Visual-Inertial Telepresence for Aerial Manipulation,
International Conference on Robotics and Automation (ICRA), 2020.
- [C5] J Lee, M Humt, J Feng and R Triebel,
Estimating Model Uncertainty of Neural Networks in Sparse Information Form,
International Conference on Machine Learning (ICML), 2020.
- [C6] J Liu, I Chiotellis, R Triebel and D Cremers,
Effective Version Space Reduction for Convolutional Neural Networks,
European Conference on Machine Learning and Data Mining (ECML-PKDD), 2020.
- [C7] M Denninger and R Triebel,
3D Scene Reconstruction from a Single Viewport,
European Conference on Computer Vision (ECCV), 2020.
- [C8] M Sewtz, T Bodenmüller and R Triebel,
Robust MUSIC-Based Sound Source Localization in Reverberant and Echoic Environments,
International Conference on Intelligent Robots and Systems (IROS), 2020.
- [C9] CL Gentil, M Vayugundla, R Giubilato, W Stürzl, TA. Vidal-Calleja and R Triebel,
Gaussian Process Gradient Maps for Loop-Closure Detection in Unstructured Planetary Environments,
International Conference on Intelligent Robots and Systems (IROS), 2020.
- [C10] W Boerdijk, M Sundermeyer, M Durner and R Triebel,
Self-Supervised Object-in-Gripper Segmentation from Robotic Motions,
Conference on Robot Learning (CoRL), 2020.
- [C11] F Schiel, A Hagenhuber, J Vogel and R Triebel,
Incremental learning of EMG-based control commands using Gaussian Processes,
Conference on Robot Learning (CoRL), 2020.
- [C12] M Stoiber, M Pfanne, K Strobl, R Triebel and A Albu-Schaeffer,
A Sparse Gaussian Approach to Region-Based 6DoF Object Tracking,
Asian Conference on Computer Vision, 2020, **Oral Presentation.**
- [C13] L Meyer, K Strobl and R Triebel,
Robust Vision-Based Pose Correction for a Robotic Manipulator using Active Markers,
17th International Symposium on Experimental Robotics (ISER), 2020.

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- [C14] E.Y. Puang, P. Lehner, Z.C. Marton, M. Durner, R. Triebel and A. Albu-Schäffer,
Visual Repetition Sampling for Robot Manipulation Planning,
International Conference on Robotics and Automation (ICRA), 2019.
- [C15] F. Steidle, W. Stürzl and R. Triebel,
Visual-inertial sensor fusion with a bio-inspired polarization compass for navigation of MAVs,
11th International Micro Air Vehicle Competition and Conference (IMAV), 2019.
- [C16] J. Feng, M. Durner, Z.-C. Marton, F. Balint-Benczedi and R. Triebel,
Introspective Robot Perception using Smoothed Predictions from Bayesian Neural Networks,
International Symposium on Robotics Research (ISRR), 2019.
- [C17] M. Brucker, M. Durner, R. Ambrus, Z.-C. Marton, A. Wendt, P. Jensfelt, K.O. Arras and R. Triebel,
Semantic Labeling of Indoor Environments from 3D RGB Maps,
International Conference on Robotics and Automation (ICRA), 2018.
- [C18] M. Sundermeyer, Z. Marton, M. Durner, M. Brucker and R. Triebel,
Implicit 3D Orientation Learning for 6D Object Detection from RGB Images,
European Conference on Computer Vision (ECCV), September 2018, **Best Paper Award**.
- [C19] M. Denninger and R. Triebel,
Persistent Anytime Learning of Objects from Unseen Classes,
International Conference on Intelligent Robots and Systems (IROS), Madrid, Spain, Oct. 2018, **Best Cognitive Robotics Paper Finalist**.
- [C20] I. Grixá, P. Schulz, W. Stürzl and R. Triebel,
Appearance-Based Along-Route Localization for Planetary Missions,
International Conference on Intelligent Robots and Systems (IROS), Madrid, Spain, Oct. 2018.
- [C21] I. Chiotellis, F. Zimmermann, D. Cremers and R. Triebel,
Incremental Semi-Supervised Learning from Streams for Object Classification,
International Conference on Intelligent Robots and Systems (IROS), Madrid, Spain, Oct. 2018.
- [C22] M. Brucker, M. Durner, Z.-C. Marton, F. Balint-Benczedi, M. Sundermeyer and R. Triebel,
6DoF Pose Estimation for Industrial Manipulation based on Synthetic Data,
International Symposium on Experimental Robotics (ISER), Buenos Aires, Argentina, Nov. 2018.
- [C23] C. Nissler, M. Durner, Z.-C. Marton and R. Triebel,
Simultaneous Calibration and Mapping,
International Symposium on Experimental Robotics (ISER), Buenos Aires, Argentina, Nov. 2018.
- [C24] M. Ullrich, H. Ali, M. Durner, ZC Marton and R. Triebel,
Selecting CNN Features for Online Learning of 3D Objects,
International Conference on Intelligent Robots and Systems (IROS), 2017.

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- [C25] C Nissler, ZC Marton, H Kisner, U Thomas and R Triebel,
A Method for Hand-Eye and Camera-to-Camera Calibration for Limited Fields of View,
International Conference on Intelligent Robots and Systems (IROS), 2017.
- [C26] TS Wang, ZC Marton, M Brucker and R Triebel,
How Robots Learn to Classify New Objects Trained from Small Data Sets,
Conference on Robot Learning (CoRL), 2017.
- [C27] M Durner, S Kriegel, S Riedel, M Brucker, ZC Marton, F Balint-Benczedi and R Triebel,
Experience-based Optimization of Robotic Perception,
International Conference on Advanced Robotics (ICAR), 2017.
- [C28] A. Narr, R. Triebel and D. Cremers,
Stream-based Active Learning for Efficient and Adaptive Classification of 3D Objects,
International Conference on Robotics and Automation (ICRA), May 2016.
- [C29] I. Chiotellis, R. Triebel, T. Windheuser and D. Cremers,
Non-Rigid 3D Shape Retrieval via Large Margin Nearest Neighbor Embedding,
European Conference on Computer Vision (ECCV), October 2016.
- [C30] S. Sharifzadeh, I. Chiotellis, R. Triebel and D. Cremers,
Learning to Drive using Inverse Reinforcement Learning and Deep Q-Networks,
NIPS Workshops, December 2016.
- [C31] D. Mund, R. Triebel and D. Cremers,
Active Online Confidence Boosting for Efficient Object Classification,
Proc. IEEE International Conference on Robotics and Automation (ICRA), 2015.
- [C32] R. Triebel, K. Arras, R. Alami, L. Beyer, S. Breuers, R. Chatila, M. Chetouani, D. Cremers, V. Evers, M. Fiore, H. Hung, O. A. I Ramirez, M. Joose, H. Khambhaita, T. Kucner, B. Leibe, A. J. Lilienthal, T. Linder, M. Lohse, M. Magnusson, B. Okal, L. Palmieri, U. Rafi, M. van Rooij and L. Zhang,
SPENCER: A Socially Aware Service Robot for Passenger Guidance and Help in Busy Airports,
Proc. Field and Service Robotics (FSR), 2015.
- [C33] Y. Tao, R. Triebel and D. Cremers,
Semi-supervised Online Learning for Efficient Classification of Objects in 3D Data Streams,
International Conference on Intelligent Robots and Systems (IROS), sept 2015.
- [C34] F. Stark, C. Hazirbas, R. Triebel and D. Cremers,
CAPTCHA Recognition with Active Deep Learning,
GCPR Workshop on New Challenges in Neural Computation, Aachen, Germany, 2015.
- [C35] T. Windheuser, M. Vestner, E. Rodola, R. Triebel and D. Cremers,
Optimal Intrinsic Descriptors for Non-Rigid Shape Analysis,
British Machine Vision Conference (BMVC), 2014.

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- [C36] R. Triebel, J. Stühmer, M. Souiai and D. Cremers,
Active Online Learning for Interactive Segmentation Using Sparse Gaussian Processes,
German Conference on Pattern Recognition, 2014.
- [C37] S. Debnath, S. S. Baishya, R. Triebel, V. Dutt and D. Cremers,
Environment-adaptive Learning: How Clustering Helps to Obtain Good Training Data,
Carsten Lutz and Michael Thielscher(Eds.), *KI 2014: Advances in Artificial Intelligence*, Springer, 68-79, 2014.
- [C38] P. Furgale, U. Schwesinger, M. Rufli, W. Derendarz, H. Grimmert, P. Mühlfellner, S. Wonneberger, J. Timpner, S. Rottmann, B. Li, B. Schmidt, T. N Nguyen, E. Cardarelli, S. Cattani, S. Brüning, S. Horstmann, M. Stellmacher, H. Mielenz, K. Köser, M. Beermann, C. Häne, L. Heng, G. H. Lee, F. Fraundorfer, R. Iser, R. Triebel, I. Posner, P. Newman, L. Wolf, M. Pollefeys, S. Brosig, J. Effertz, C. Pradalier and R. Siegwart,
Toward Automated Driving in Cities using Close-to-Market Sensors,
Proc. of IEEE Intelligent Vehicles Symposium, 2013.
- [C39] H. Grimmert, R. Paul, R. Triebel and I. Posner,
Knowing When We Dont Know: Introspective Classification for Mission-Critical Decision Making,
IEEE International Conference on Robotics and Automation (ICRA), 2013.
- [C40] R. Triebel, H. Grimmert and I. Posner,
Confidence Boosting: Improving the Introspectiveness of a Boosted Classifier for Efficient Learning,
Autonomous Learning Workshop at ICRA, 2013.
- [C41] R. Triebel, H. Grimmert, R. Paul and I. Posner,
Introspective Active Learning for Scalable Semantic Mapping,
Workshop on Active Learning in Robotics: Exploration, Curiosity, and Interaction at Robotics: Science and Systems, 2013.
- [C42] R. Triebel, H. Grimmert, R. Paul and I. Posner,
Driven Learning for Driving: How Introspection Improves Semantic Mapping,
The International Symposium on Robotics Research (ISRR), 2013.
- [C43] R. Paul, R. Triebel, D. Rus and P. Newman,
Semantic Categorization of Outdoor Scenes with Uncertainty Estimates using Multi-Class Gaussian Process Classification,
Proc. of the International Conference on Intelligent Robots and Systems (IROS), 2012.
- [C44] R. Triebel, R. Paul, D. Rus and P. Newman,
Parsing Outdoor Scenes from Streamed 3D Laser Data Using Online Clustering and Incremental Belief Updates,
Robotics Track of AAAI Conference on Artificial Intelligence, 2012.
- [C45] J. Shin, R. Triebel and R. Siegwart,
Unsupervised 3D Object Discovery and Categorization for Mobile Robots,
Proc. of the International Symposium on Robotics Research (ISRR), 2011.

- [C46] J. Maye, R. Triebel, L. Spinello and R. Siegwart,
Bayesian On-line Learning of Driving Behaviors,
International Conference on Robotics and Automation (ICRA), 2011.
- [C47] R. Kaestner, N. Engelhard, R. Triebel and R. Siegwart,
A Bayesian Approach to Learning 3D Representations of Dynamic Environ-
ments,
Proc. of The 12th International Symposium on Experimental Robotics (ISER), Berlin,
Springer Press, 2010.
- [C48] L. Spinello, R. Triebel, D. Vasquez, K. Arras and R. Siegwart,
Exploiting Repetitive Object Patterns for Model Compression and Completi-
on,
European Conference on Computer Vision, 2010.
- [C49] R. Triebel, J. Shin and R. Siegwart,
Segmentation and Unsupervised Part-based Discovery of Repetitive Objects,
Robotics: Science and Systems, 2010.
- [C50] L. Spinello, K. O. Arras, R. Triebel and R. Siegwart,
A Layered Approach to People Detection in 3D Range Data,
special track on Physically Grounded AI of AAAI, 2010.
- [C51] J. Shin, R. Triebel and R. Siegwart,
Unsupervised Discovery of Repetitive Objects,
International Conference on Robotics and Automation (ICRA), 2010.
- [C52] J. Maye, L. Spinello, R. Triebel and R. Siegwart,
Inferring the Semantics of Direction Signs in Public Places,
International Conference on Robotics and Automation (ICRA), 2010.
- [C53] L. Spinello, A. Macho, R. Triebel and R. Siegwart,
Detecting Pedestrians at Very Small Scales,
Proc. of the International Conference on Intelligent Robots and Systems (IROS), 2009.
- [C54] L. Spinello, R. Triebel and R. Siegwart,
Multiclass Multimodal Detection and Tracking in Urban Environments,
Proc. of Field and Service Robotics (FSR), 2009.
- [C55] D. Engel, L. Spinello, R. Triebel, C. Curio, R. Siegwart and H. Bülthoff,
Medial Features for Superpixel Segmentation,
Proc. of the IAPR Conference on Machine Vision Applications (MVA), 2009.
- [C56] L. Spinello, R. Triebel and R. Siegwart,
Multimodal Detection and Tracking of Pedestrians in Urban Environments
with Explicit Ground Plane Extraction,
Proc. of the International Conference on Intelligent Robots and Systems (IROS), 2008.
- [C57] L. Spinello, R. Triebel and R. Siegwart,
Multimodal People Detection and Tracking in Crowded Scenes,
Proc. of the Twenty-Third Conference on Artificial Intelligence (AAAI), 2008.

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- [C58] R. Triebel, O. M. Mozos and W. Burgard,
Collective Classification for Labeling of Places and Objects in 2D and 3D Range Data,
Proc. of the 31th Annual Conference of the German Classification Society on Data Analysis, Machine Learning, and Applications, 2007.
- [C59] R. Kümmerle, P. Pfaff, R. Triebel and W. Burgard,
Active Monte Carlo Localization in Outdoor Terrains using Multi-Level Surface Maps,
Fachgespräche Autonome Mobile Systeme (AMS), 2007.
- [C60] R. Triebel and W. Burgard,
Recovering the Shape of Objects in 3D Point Clouds with Partial Occlusions,
Proc. of the 6th International Conference on Field and Service Robotics (FSR), 2007.
- [C61] P. Pfaff, R. Triebel, C. Stachniss, P. Lamon, W. Burgard and R. Siegwart,
Towards Mapping of Cities,
International Conference on Robotics and Automation (ICRA), 2007.
- [C62] R. Triebel, R. Schmidt, O. M. Mozos and W. Burgard,
Instance-based AMN Classification for Improved Object Recognition in 2D and 3D Laser Range Data,
Proc. of the International Joint Conference on Artificial Intelligence (IJCAI), 2007.
- [C63] R. Triebel, P. Pfaff and W. Burgard,
Multi-Level Surface Maps for Outdoor Terrain Mapping and Loop Closing,
Proc. of the International Conference on Intelligent Robots and Systems (IROS), 2006.
- [C64] R. Triebel, K. Kersting and W. Burgard,
Robust 3D Scan Point Classification using Associative Markov Networks,
International Conference on Robotics and Automation (ICRA), 2006.
- [C65] H. Andreasson, R. Triebel and A. Lilienthal,
Vision-based Interpolation of 3D Laser Scans,
Proc. International Conference on Autonomous Robots and Agents (ICARA), 2006.
- [C66] H. Andreasson, R. Triebel and W. Burgard,
Improving Plane Extraction from 3D Data by Fusing Laser Data and Vision,
Proc. of the International Conference on Intelligent Robots and Systems (IROS), 2005.
- [C67] R. Triebel and W. Burgard,
Improving Simultaneous Localization and Mapping in 3D Using Global Constraints,
Proc. of the Twentieth National Conference on Artificial Intelligence (AAAI), 2005.
- [C68] R. Triebel, W. Burgard and F. Dellaert,
Using Hierarchical EM to Extract Planes from 3D Range Scans,
International Conference on Robotics and Automation (ICRA), 2005.
- [C69] R. Triebel, B. Frank, J. Meyer and W. Burgard,
First steps towards a robotic system for flexible volumetric mapping of indoor environments,
Proc. of the 5th IFAC/EURON Symposium on Intelligent Autonomous Vehicles (IAV), 2004.

- [C70] S. Thrun, D. Hähnel, D. Ferguson, M. Montemerlo, R. Triebel, W. Burgard, C. Baker, Z. Omohundro, S. Thayer and W. Whittaker,
A system for volumetric robotic mapping of underground mines,
Proc. of the IEEE International Conference on Robotics and Automation (ICRA), 2003.
- [C71] D. Hähnel, R. Triebel, W. Burgard and S. Thrun,
Map Building with Mobile Robots in Dynamic Environments,
Proc. of the IEEE International Conference on Robotics and Automation (ICRA), 2003.