# Cyrill **Stachniss**


PROFESSOR · PHOTOGRAMMETRY & ROBOTICS

*University of Bonn · Photogrammetry & Robotics · Nussallee 15 · 53115 Bonn · Germany*

+49 228 73 2714 | cyrill.stachniss@igg.uni-bonn.de | www.ipb.uni-bonn.de | YouTube | GScholar


## Research Interests

| | |
|---|---|
| **Main Areas** | Robotics; photogrammetry — perception and state estimation; navigation; simultaneous localization and mapping; semantic scene interpretation; learning |
| **Applications** | autonomous cars; agricultural robotics; service robotics |

## Education

**Habilitation and venia legendi in Computer Science** — *University of Freiburg*

THESIS: *Spatial Modeling and Robot Navigation* — *11/2009*

**Dr. rer. nat. (Ph.D.) in Computer Science – *summa cum laude* / mit Auszeichnung** — *University of Freiburg*

THESIS: *Exploration and Mapping with Mobile Robots* — *04/2006*

**Diplom (M.Sc.) in Computer Science – *summa cum laude* / mit Auszeichnung** — *University of Freiburg*

THESIS: *Goal-directed Obstacle Avoidance for Mobile Robots in Dynamic Environments* — *08/2002*

**Vordiplom in Computer Science and in Physics** — *University of Marburg*

DEGREE IN COMPUTER SCIENCE: 03/200; DEGREE IN PHYSICS: 11/1999 — *1999/2000*

## Academic Positions

**Full Professor (W3) and head of the Photogrammetry & Robotics Lab** — *University of Bonn*

PHOTOGRAMMETRY & ROBOTICS LAB, INSTITUTE OF GEODESY AND GEOINFORMATION, UNIVERSITY OF BONN — *since 04/2014*

**Visiting Professor in Engineering (in parallel to the appointment at Bonn University)** — *University of Oxford*

DEPARTMENT OF ENGINEERING SCIENCE, UNIVERSITY OF OXFORD — *02/2022-02/2025*

**Lecturer (Privatdozent und Akademischer Rat, A13)** — *University of Freiburg*

LAB FOR AUTONOMOUS INTELLIGENT SYSTEMS, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF FREIBURG — *10/2010-03/2014*

**Deputy professorship (Lehrstuhlvertretung, W3)** — *University of Freiburg*

LAB FOR AUTONOMOUS INTELLIGENT SYSTEMS, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF FREIBURG — *10/2009-09/2010*

**Guest lecturer** — *University of Zaragoza*

DIPARTIMENTO INFORMÁTICA E INGENIERÍA DE SISTEMAS, UNIVERSITY OF ZARAGOZA — *Spring 2009*

**Akademischer Rat (A13)** — *University of Freiburg*

LAB FOR AUTONOMOUS INTELLIGENT SYSTEMS, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF FREIBURG — *10/2007-09/2009*

**Postdoc** — *University of Freiburg*

LAB FOR AUTONOMOUS INTELLIGENT SYSTEMS, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF FREIBURG — *10/2006-09/2007*

**Senior researcher** — *ETH Zurich*

AUTONOMOUS SYSTEMS LAB, DEP. OF MECHANICAL AND PROCESS ENGINEERING, ETH ZURICH — *05/2006-10/2006*

**Ph.D. student and research associate** — *University of Freiburg*

LAB FOR AUTONOMOUS INTELLIGENT SYSTEMS, DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF FREIBURG — *12/2002-04/2006*

## Citation Indices

**h-index: 83** · **i10-index: 268** · **Number of citations: 36 658** · all indices determined using GoogleScholar on Nov 29

## Honors & Awards

**IROS 2024 Best Agri-Robotics Paper Award** for *BonnBeetClouds3D: A Dataset Towards Point Cloud-Based Organ-Level Phenotyping of Sugar Beet Plants Under Real Field Conditions* — 2024

**Finalist – IROS 2024 Best Agri-Robotics Paper Award** for *Spatio-Temporal Consistent Mapping of Growing Plants for Agricultural Robots in the Wild* — 2024

**IROS 2024 Workshop on "Agricultural Robotics for Sustainable Futures" Best Paper Award** for *BonnBeetClouds3D: A Dataset Towards Point Cloud-Based Organ-Level Phenotyping of Sugar Beet Plants Under Real Field Conditions* — 2024

**IROS 2024 Workshop on "Label Efficient Learning Paradigms for Autonomoy at Scale" Best Paper Award** for *Active Learning of Robot Vision Using Adaptive Path PLanning* — 2024

**Second Place – IROS 2024 Workshop on "AI and Robotics For Future Farming" Best Paper Award** for *AdaCropFollow: Self-Supervised Online Adaptation for Visual Under-Canopy Navigation* — 2024

**Finalist – ICRA 2024 Best Service Robotics Paper Award** for *Efficient and Accurate Transformer-Based 3D Shape Completion and Reconstruction of Fruits for Agricultural Robots* — 2024

**IEEE Robotics and Automation Letters Best Paper Award for 2023** for *KISS-ICP: In Defense of Point-to-Point ICP – Simple, Accurate, and Robust Registration If Done the Right Way* — 2024

**IEEE Robotics and Automation Letters Honorable Mention for 2023** for *High Precision Leaf Instance Segmentation in Point Clouds Obtained Under Real Field Conditions* — 2024

**ICRA 2023 Best Automation Paper Award** for *Target-Aware Implicit Mapping for Agricultural Crop Inspection* — 2023

**Finalist – IROS 2022 Best Agri-Robotics Paper Award** for *Contrastive 3D Shape Completion and Reconstruction for Agricultural Robots using RGB-D Frames* — 2022

**IEEE Robotics & Automation Magazine Best Paper Award for 2021** for *Building an Aerial-Ground Robotics System for Precision Farming: An Adaptable Solution* — 2022

**ICRA Outstanding Automation Paper Award** for *Precise 3D Reconstruction of Plants from UAV Imagery Combining Bundle Adjustment and Template Matching* — 2022

**Best Result on the Segmenting and Tracking Every Point and Pixel Workshop at ICCV 2021** for *Contrastive Instance Association for 4D Panoptic Segmentation* — 2021

**Faculty Award 2021 for Geodesy** for *Adaptive Robust Kernels for Non-Linear Least Squares Problems* (N. Chebrolu et al., RAL) — 2021

**IROS 2020 – Best Agri-Robotics Paper Award** for *Unsupervised Domain Adaptation for Transferring Plant Classification Systems to New Field Environments, Crops, and Robots* — 2020

**Finalist – RSS 2020 Best Systems Paper Award** for *OverlapNet: Loop Closing for LiDAR-based SLAM* — 2020

**Faculty Award 2019 for Geodesy** for *A General Framework for Flexible Multi-cue Photometric Point Cloud Registration* (I. Bogoslavskyi et al., ICRA) — 2019

**Best Demo Award of the ICRA 2018 Workshop** on Multimodal Robot Perception: Perception, Inference, and Learning for Joint Semantic, Geometric, and Physical Understanding — 2018

**Finalist – ICRA 2018 Best Service Paper Award** for *Real-Time Semantic Segmentation of Crop and Weed for Precision Agriculture Robots Leveraging Background Knowledge in CNN* — 2018

**Finalist – IROS 2017 Best Application Paper Award** for *Semi-Supervised Online Visual Crop and Weed Classification in Precision Farming Exploiting Plant Arrangement* — 2017

**ICRA 2017 Best Automation Paper Award** for *UAV-Based Crop and Weed Classification for Smart Farming* — 2017

**Finalist – ICRA 2015 Best Service Robotics Paper Award** for *Robot, Organize my Shelves! Tidying up Objects by Predicting User Preferences* — 2015

**Faculty Teaching Award (Fakultätslehrpreis)** for the lecture *Robot Mapping* taught in winter term 2012/13 — 2013

**IEEE RAS Early Career Award** for my contributions to mobile robot exploration and SLAM — 2013

**ICRA 2013 Best Associate Editor Award** — 2013

**Finalist – ICRA 2013 Best Student Paper** for *Robust Map Optimization Using Dynamic Covariance Scaling* — 2013

**Robotics: Science and Systems Early Career Spotlight** — 2012

**Microsoft Research Faculty Fellow** — 2010

**EURON Georges Giralt Award** for the best robotics thesis in Europe defended in 2006 — 2008

**Wolfgang-Gentner Award** for my Ph.D. thesis *Exploration and Mapping with Mobile Robots* — 2006

**Finalist – ICRA 2005 Best Student Paper** for *Supervised Learning of Places from Range Data using AdaBoost* — 2005

**ICASE-IROS 2004 Best Paper Award on Application Award‘** for *Grid-based FastSLAM and Exploration with Active Loop Closing* — 2005

**Förderpreis des Vereins Deutscher Ingenieure (VDI)** for my Master's thesis — 2003

# Research Projects

## Research Project Coordination Activities

**Spokesperson** of the DFG Cluster of Excellence EXC 2070 PhenoRob *2019-2025*
**Spokesperson** of the DFG Research Unit FOR 1505 Mapping on Demand *2015-2019*
**Coordinator** of the EC funded FP7 project ROVINA *2013-2016*
**Vice-Coordinator** of the EC funded FP7 project EUROPA2 *2013-2014*
**Vorstandsmitglied** (member of the board of directors) of the SFB-TR 8 “Spatial Cognition” *2013-2014*
**Vice-Coordinator and scientific project manager** of the FP7 project First-MM *2010-2013*
**Vice-Coordinator and scientific project manager** of the FP7 project EUROPA *2009-2012*

## Principal Investigator of Funded Research Projects

**RIG** – Robotics Institute Germany *2024-2028*
Principal investigator, funded by the Federal Ministry of Education and Research (BMBF).

**Lamarr Institute** – Lamarr Institute for Machine Learning and Artificial Intelligence *since 2022*
Principal investigator, institutionally funded by the Federal Ministry of Education and Research (BMBF) and the State of North Rhine-Westphalia as part of the German government’s AI strategy.

**Exploiting Repeated Data Acquisitions for Improved Long-term Monitoring Capabilities,** project within the DFG AI Research Unit FOR 5351 AID4Crops – Automation and AI for Monitoring and Decision Making of Horticultural Crops *2023-2027*
Principal investigator, funded by the DFG, STA 1051/5-1.

**DIGIFOREST** – Digital Analytics and Robotics for Sustainable Forestry *2022-2026*
Principal investigator, funded by the European Commission within Horizon Europe.

**DFG Cluster of Excellence EXC 2070 PhenoRob** – Robotics and Phenotyping for Sustainable Crop Production *2019-2025*
Spokesperson and principal investigator, funded by the DFG, EXC 2070

**Harmony** – Enhancing Healthcare with Assistive Robotic Mobile Manipulation *2021-2024*
Principal investigator, funded by the European Commission within H2020.

**RegisTer** – Einsatz von Künstlicher Intelligenz und optischen Sensoren bei der Sortenbeschreibung des Bundessortenamtes in der Register- und Wertprüfung im Rahmen der Sortenzulassung bei Zuckerrüben *2021-2024*
Principal investigator, funded by the Bundesanstalt für Landwirtschaft und Ernährung (BLE).

**Determining Plant Performance Indicators with Agricultural Robots** *2019-2020*
Principal investigator, funded by the Robert Bosch GmbH.

**Exploration for Micro Aerial Vehicles,** project within the Research Unit FOR 1505 Mapping on Demand *2016-2019*
Principal investigator, funded by the DFG.

**Incremental Mapping from Image Sequences,** project within the Research Unit FOR 1505 Mapping on Demand *2015-2018*
Principal investigator, funded by the DFG.

**Robust Direct Georeferencing of Lightweight UAV,** project within the Research Unit FOR 1505 Mapping on Demand *2015-2018*
2nd principal investigator (Mitantragsteller), funded by the DFG.

**Flourish** – Aerial Data Collection and Analysis, and Automated Ground Intervention for Precision Farming *2015-2018*
Principal investigator, funded by the European Commission within H2020.

**RobDREAM** – Optimising Robote Performance While Dreaming *2015-2018*
Principal investigator, funded by the European Commission within H2020.

**EUROPA2** – European Robotic Pedestrian Assistant 2.0. *2013-2016*
Vice-coordinator and principal investigator, funded by the European Commission within FP7.

**ROVINA** – Mobile Robots for Exploration, Digital Preservation and Visualization of Archaeological Sites *2013-2016*
Coordinator and principal investigator, funded by the European Commission within FP7.

**AdvancedEDC** – Advanced Intracortical Neural Probes with Electronic Depth Control. *2014-2015*
Principal investigator, funded by the DFG with in the Cluster of Excellence BrainLinks—BrainTools.

**STAMINA** – Sustainable and Reliable Robotics for Part Handling in Manufacturing Automation *2013-2014*
Principal investigator, funded by the European Commission within FP7, participation ended with the move to the University of Bonn in 2014.

**Industry project** on the automatic evaluation of an obstacle detection systems for cars. *2012*
Principal investigator, funded by ifm automotive GmbH.

**MultiBot** – Cooperative Human-Robot Exploration *2011-2014*
Principal investigator (Mitantragsteller), within the 3rd phase of the SFB/TR 8 Spatial Cognition, funded by the DFG.

**TAPAS** – Robotics-enabled Logistics and Assistive Services for the Transformable Factory of the Future *2010-2014*
Principal investigator, funded by the European Commission within FP7.

**First-MM** – Flexible Skill Acquisition and Intuitive Robot Tasking for Mobile Manipulation in the Real World *2009-2013*
Vice-coordinator and principal investigator, funded by the European Commission within FP7.

**EUROPA** – European Robotic Pedestrian Assistant *2009-2012*
Vice-coordinator and principal investigator, funded by the European Commission within FP7.

**Industry project** on service robotics in industrial applications *2012*
Principal investigator, funded by MT Robotik AG.

**MultiBot** – Coorporative Multi-Robot Exploration *2007-2010*
Principal investigator (Mitantragsteller), within the 2nd phase of the SFB/TR 8 Spatial Cognition, funded by the DFG.

**RAWSEEDS** – Robotics Advancements through Web-publishing of Sensorial and Elaborated Extensive Data Sets *2007-2009*
Principal investigator, funded by the European Commission within FP7.

**Industry project** on navigation and service robotics *2007-2009*
Principal investigator, funded by Toyota Europe.

**Industry project** on robust simultaneous localization and mapping *2006*
Principal investigator, funded by Toyota Europe.

## Co-Founded Companies

**Pheno-Inspect GmbH** located in Oberhausen, Germany *since 2020*

**Escarda Technologies GmbH** located in Berlin, Germany *since 2019*

**DeepUp GmbH / DeepUp Beteiligungs UG** located in Bonn, Germany; successful exit in 2023 *2019-2023*

## Consultancy Activities for Companies

**Several advisory actvities under NDA** *N/A*

**KUKA Roboter / KUKA Laboratories, Augsburg, Germany** *2008-2014*

**Numovis Inc., Menlo Park, CA, USA** *2010-2011*

**MT Robotik AG, Zwingen, Switzerland** *2008-2010*

## Further Academic Activities

**Center for Robotics** – Spokesperson and Founding Member of the Center for Robotics in Bonn *since 2024*

**Evaluation Commission** – Chair of the Evaluation Commission (EPG) for Study Programs *since 2024*

**Ph.D. Student Admission Commission** – Member of the Faculty Commission for admitting Ph.D. students *since 2023*

**Study Commission** – Chair (Vorsitzender) of the Study Commission of the Institute of Geodesy and Geoinformation *since 2020*

**Research Commission** – Member of the Research Commission (Forschungskommission) of the Faculty of Agriculture *since 2019*

**Tenure Track Evaluation Commission** – Member of the Tenure Track Commission of the Faculty of Agriculture *since 2019*

**Recruitment Committees** – I have been a member in approx. 12 internal and 12 external recuitement committees (Berufungskommissionen) *since 2014*

**42 Wolfsburg Fellow** – Follow of the 42 Wolfsburg Software Engineering School within the track Software Engineering Automotive & Mobility Ecosystems *2021-2023*

**ISPRS WG II/1** – Chair of the Working Group II/1 on Image Orientation of the Intl. Society for Photogrammetry and Remote Sensing *2017-2021*

**Transdisciplinary Research Area (TRA)** – Set up of the TRA “Innovation and Technology for Sustainable Future” within the Excellence Stragey of the University of Bonn together with Joachim von Braun. Subsequenlty, member of the Steering Committee of the TRA. *2017-2020*

**Institute of Geodesy and Geoinformation** – Deputy managing director *2015-2017*

## External Ph.D. Committee Memberships

**ETH Zurich,** Switzerland *2018, 2019, 2021, 2024, 2025*
**University of Illinois Urbana-Champaign,** US *2024/25*
**La Sapienza University of Rome,** Italy *2017, 2019,2020, 2021, 2023*
**University of Oxford,** UK *2014, 2021, 2023*
**Imperial College London,** UK *2023*
**Wageningen University,** Netherlands *2023*
**TU Braunschweig,** Germany *2023*
**University Rennes,** France *2022*
**TU Berlin,** Germany *2022*
**RWTH Aachen,** Germany *2020, 2021*
**University of Pisa,** Italy *2021*
**University of Lincoln,** UK *2019*
**Queensland University of Technology,** Australia *2014, 2018*
**University of Freiburg,** Germany *2014–2017*
**University of Hannover,** Germany *2016*
**KTH Stockholm,** Sweden *2012*
**University of Sydney,** Australia *2011*
**Polytechnic University of Catalonia,** Barcelona, Spain *2011*

## Teaching at the University of Bonn

**Photogrammetry I** – University of Bonn, BSc, lecture, 5 h/week, summer term *since 2014*
**Photogrammetry II** – University of Bonn, BSc, lecture, 3 h/week, winter term *since 2014*
**Photogrammetry and Remote Sensing** – University of Bonn, MSc, lecture, 3 h/week, winter term *since 2014*
**Mobile Sensing and Robotics I** – University of Bonn, MSc, lecture, 3 h/week, winter term *since 2017*
**Mobile Sensing and Robotics II** – University of Bonn, MSc, lecture, 3 h/week, summer term *since 2017*
**Modern C++ for Computer Vision** – University of Bonn, MSc, lecture & project, 4 h/week *since 2015*
**Mobile Sensing and Robotics Project** – University of Bonn, master project, MSc, every term *since 2018*
**Techniques for Self-Driving Cars** – University of Bonn, MSc, lecture & project, 4 h/week *since 2020*
**Graph-based SLAM** – University of Bonn, MSc, lecture, 2 h/week, summer term *since 2024*
**Photogrammetric Analysis for Snow Mass Change Detection** – University of Bonn, Msc, project, winter term *2023*
**Robot Programming using ROS** – University of Bonn, MSc, lecture & project, 4 h/week *2016-2019*
**Mobile Mapping with Multi-Sensor Systems Project** – University of Bonn, master project, Msc every term *2015-2017*
**3D Mapping** – University of Bonn, MSc, block module, 4 h/week *2016-2017*
**Several guest lectures, small lectures & practical courses** – University of Bonn *2014-2018*

## Teaching at the University of Freiburg

**Robot Mapping** – University of Freiburg, MSc, lecture, 4 h/week, winter term *2012-2013*
**Introduction to Mobile Robotics** – University of Freiburg, MSc, lecture, 4 h/week, shared teaching, summer term *2007-2013*
**Advanced Robotics/Robotics II** – University of Freiburg, MSc, lecture, 4 h/week, shared teaching, winter term *2010-2012*
**Introduction to Computer Science** – University of Freiburg, BSc, lecture, 4 h/week, shared teaching, summer term *2007-2013*
**Several practical courses and seminars** – University of Freiburg *2007-2013*

## Online Teaching Examples (Links to Youtube Videos)

**PILS: Neural Network Basics for Image Interpretation** – Link: `https://www.youtube.com/watch?v=-hCpilS5EXo` *2022*
**Mobile Robotics: Monte-Carlo Localization** – Link: `https://www.youtube.com/watch?v=MsYlueVDLI0` *2020*
**Mobile Robotics: A* Motion Planning** – Link: `https://www.youtube.com/watch?v=HR1TNa8Lp7w` *2020*
**5 Min: SIFT Features Explained in 5 Minutes** – Link: `https://www.youtube.com/watch?v=4AvTMVD9ig0` *2020*
**5 Min: Bundle Adjustment Explained in 5 Minutes** – Link: `https://www.youtube.com/watch?v=lmj2Jk5tl60` *2020*
**Photogrammetric CV: Bundle Adjustment** – Link: `https://www.youtube.com/watch?v=sobyKHwgB0Y` *2020*
**SLAM Course: Bayes Filter (in class room)** – Link: `https://www.youtube.com/watch?v=5Pu558YtjYM` *2013*

# Invited Talks

## Plenary and Keynote Talks

**ICAR** – Plenary at Intl. Conf. on Advanced Robotics, San Juan, AR *12/2025*
**IEEE-YP** – IEEE Young Professionals at IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems, Abu Dhabi, UAE *10/2024*
**Hi!Paris** – Keynote at the Center on Data Analytics and Artificial Intelligence for Science, Business and Society, Paris, FR *06/2024*
**IPPS** – Keynote speech at the Int. Plant Phenotyping Symposium, Wageningen, NL *09/2022*
**Future of Construction** – Keynote speech at the Future of Construction Symposium, Zurich, CH *06/2022*
**IV Workshop** – Keynote speech at IEEE Intelligent Vehicles Symposium Workshop on 3D Deep Learning for Autonomous Driving, Aachen, DE *06/2022*
**DGR Tage** – Keynote speech at Deutsche Gesellschaft für Robotik, remote *10/2021*
**CEVVE Conference** – Keynote speech at the Intl. Conf. on Electric Vehicle and Vehicle Engineering, remote *09/2021*
**ITCS Workshops** – Invited talk at the IEEE Int. Conf. on Intelligent Transportation Systems Workshops, remote *09/2020*
**ECCV Workshops** – Keynote speech at the Europ. Conf. on Computer Vision Workshops, remote *08/2020*
**ICRA Conference** – Keynote speech at the IEEE Int. Conf. on Robotics & Automation, remote *06/2020*
**BMVA Technical Meeting** – Keynote speech at the BMVA Technical Meeting, London, UK *07/2018*
**ISPRS Congress** – Keynote speech at the XXIII ISPRS Congress, Prague, CZ *07/2016*
**IAS Conference** – Plenary talk at the Int. Conf. on Intelligent Autonomous Systems, Padua, IT *07/2014*

## Other Invited Talks

University of Cambridge, UK *02/2025*
University of British Columbia, Vancouver, CA *07/2024*
ICRA Workshop on Advancing Sustainable Food Systems through Agri-Robotics Innovations, Yokohama, JP *05/2024*
ICRA Workshop on Robotics and Sustainability: A Bidirectional Relationship, Yokohama, JP *05/2024*
T2 Hibiya, Tokyo, JP *05/2024*
University Club, Bonn, DE *04/2024*
Magic Leap, Zurich, CH *12/2023*
DGK Evening Talk, Carl Friedrich von Siemens Foundation, Munich, DE *11/2023*
Outrider.ai, Boulder, CO, USA *09/2023*
ICRA Workshop: Agri-Food Robotics – From Farm To Fork, London, UK *06/2023*
Tag der Geodäsie 2023, Bonn, DE *05/2023*
Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, UAE *05/2023*
Carnegie Mellon University, guest lecture, remote *03/2023*
University of Oxford, Department of Engineering Science, Oxford, UK *02/2023*
University of Oxford, EPSRC Centre for Doctoral Training in Autonomous Intelligent Machines and Systems, remote *01/2023*
ETH Distinguished Series in Robotics, Systems and Controls, Zurich, CH *12/2022*
Poznan University of Technology, PhD school guest lecture, remote *12/2022*
IROS Workshop on Perception and Navigation for Autonomous Robotics in Unstructured Environments, Kyoto, JP *10/2022*
CDA Distinguished Speaker Seminar, University of Illinois at Urbana-Champaign, remote *03/2022*
42Wolfsburg, Wolfsburg/remote *02/2022*
Carnegie Mellon University, Tartan SLAM Series, remote *10/2021*
DAGM GCPR 2021 Workshop on Scene Understanding in Unstructured Environments, remote *09/2021*
RWTH AI Symposium, Aachen, DE *09/2021*
ECMR Workshop on Agricultural Robotics and Automation, remote *08/2021*
DAAD International Summer School on Agircultural Robotics, remote *08/2021*
Robotics Summer School on SLAM, remote *07/2021*
Worcester Polytechnic Institute, remote *11/2020*
GeoDIALOG, Bonn, DE *12/2019*
University of Lincoln CS Seminar, Lincoln, UK *12/2019*
Forschungsklausur der Universität Bonn, DE *12/2019*
Symposium Bioeconomy Science Center, Cologne, DE *11/2019*
DFG Rundgespräch Landwirtschaft, Berlin, DE *09/2019*

| | |
|---|---|
| TU Dresden Geodetic Colloquium, Dresden, DE | *07/2019* |
| Sommerfest der Universität Bonn, Bonn, DE | *06/2019* |
| Pontifical Academy of Sciences and of Social Sciences (PAS/PASS), Vatican, VI | *05/2019* |
| Forschungszentrum Jülich, IBG-2 Seminar, Jülich, DE | *04/2019* |
| UnRAVel GRK Workshop of RWTH Aachen, DE | *02/2019* |
| University Club, Bonn, DE | *01/2019* |
| Berlin Industrial Group, Berlin, DE | *01/2019* |
| ICRA 2018 Workshop on Long-term Autonomy and Deployment of Intelligent Robots in the Real World, Brisbane, AUS | *05/2018* |
| Postbank Digi-Talk Series, Bonn, DE | *04/2018* |
| Universitätsgesellschaft Bonn, DE | *04/2018* |
| Core-to-Core Intl. Symposium "3D Lab-Exchange Program", Bonn, DE | *03/2018* |
| University of Pisa, IT | *10/2017* |
| Festveranstaltung 25 Jahre ZALF, Müncheberg, DE | *07/2017* |
| DVW Seminar Vermessung mit unbemannten Flugsystemen, Bonn, DE | *02/2016* |
| Tag der Geodäsie 2015, Bonn, DE | *05/2015* |
| DVW Seminar on Multi-Sensor-Systems, Hamburg, DE | *09/2014* |
| Abschlusskolloquium SFB/TR-8 Spatial Cognition, Bremen, DE | *09/2014* |
| Tag der Geodäsie 2014, Bonn, DE | *05/2014* |
| University of Stuttgart, DE | *02/2014* |
| KUKA Tec Camp, Augsburg, DE | *02/2014* |
| Forum für Mathematik und Naturwissenschaften, Freiburg, DE | *05/2013* |
| Meeting of the German National Academy of Sciences Leopoldina, Section 2, DE | *02/2013* |
| Technical University of Cottbus, DE | *02/2013* |
| Radboud University Nijmegen, NL | *02/2013* |
| University of Bonn, DE | *01/2013* |
| Robotics: Science and Systems Early Carrer Spotlight, Sydney, AUS | *07/2012* |
| RSS Workshop on Stochastic Motion Planning, Sydney, AUS | *07/2012* |
| DGR-Tage 2011, Karlsruhe, DE | *10/2011* |
| University of Amsterdam, NL | *10/2011* |
| Georgia Tech, Atlanta, GA, USA | *09/2011* |
| Int. Symposium on Robotics Research (ISRR), Flagstaff, AZ, USA | *07/2011* |
| University of Stuttgart, DE | *05/2011* |
| Universitá La Sapienza, Rome, IT | *03/2011* |
| PAIL Seminar, Stanford University, Palo Alto, CA | *10/2010* |
| Microsoft Research, Redmond, WA | *04/2010* |
| USC Distinguished Lecture Day of Robotics, USC, Los Angeles, CA, US | *03/2010* |
| Technical University of Munich, DE | *04/2009* |
| University of Oxford, UK | *03/2009* |

# Services for Journals

## Editorial Activities

| | |
|---|---|
| **Senior Editor** for the IEEE Robotics and Automation Letters | *2015-2019* |
| **Supervising Editor** for Special Issue on Precision Agricultural Robotics and Autonomous Farming Technologies of the IEEE Robotics and Automation Letters | *2018* |
| **Guest Editor** for the Journal of Field Robotics for the special issue on Agricultural Robotics | *2018/2019* |
| **Associate Editor** for the IEEE Transactions on Robotics | *2008-2013* |
| **Guest Editor** for the Journal of Field Robotics for the special issue on Agricultural Robotics (Part 1 & 2) | *2019/2020* |
| **Guest Editor** for the Journal of Field Robotics for the special issue on Visual Mapping and Navigation Outdoors | *2009/2010* |

### Reviewing

Ad Hoc Networks; Annals of Mathematics and Artificial Intelligence; Artificial Intelligence; Autonomous Robots; Computers and Electronics in Agriculture; Field Robotics; IEEE Transactions on Autonomous Mental Development; IEEE Transactions on Mechatronics; IEEE Transactions on Robotics; IEEE Transactions on Systems, Man, and Cybernetics; IEEE Robotics and Automation Letters; IEEE Sensors Journal; Intl. Journal on Robotics Research; Intl. Journal of Pattern Recognition and Artificial Intelligence; ISPRS Journal of Photogrammetry and Remote Sensing; Journal of Artificial Intelligence Research; Journal of Geodesy; Journal of Field Robotics; PLOS One; Robots and Autonomous Systems; RSJ Advanced Robotics;

## Services for Conferences

### Chair Duties

**General Chair** Int. Conf. on Digital Technologies for Sustainable Crop Production (DIGICROP) *2020, 2022, 2025*
**General Chair** Int. Conf. on Unmanned Aerial Vehicles in Geomatics (UAVg) *2017*
**Program Chair** Int. Conf. on Digital Technologies for Sustainable Crop Production (DIGICROP) *2020, 2022, 2025*
**Program Chair** Int. Conf. on Unmanned Aerial Vehicles in Geomatics (UAVg) *2017*
**Program Chair** Spatial Cognition (SC) *2012*
**Area Chair** Robotics: Science and Systems (RSS) *2010, 2012*
**Area Chair** Int. Joint Conf. on Artificial Intelligence (IJCAI) *2013*
**Senior Programm Committee** IEEE Int. Conf. on Robotics & Automation (ICRA) *2022*
**Senior Programm Committee** Int. Joint Conf. on Artificial Intelligence (IJCAI) *2017*
**Associate Editor** IEEE Int. Conf. on Robotics & Automation (ICRA) *2009-2015*
**Associate Editor** IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS) *2011-2017, 2020*
**Exhibition Chair** European Conference on Mobile Robots (ECMR) *2021*
**Workshop Chair,** Robotics: Science and Systems (RSS) *2011*
**Publicity Chair,** Spatial Cognition (SC) *2012*
**Awards Committee,** IEEE Int. Conf. on Robotics & Automation (ICRA) *2022*
**Publicity Chair,** Robotics: Science and Systems (RSS) *2007*
**Publication Chair,** Robotics: Science and Systems (RSS) *2007*
**Local Arrangement Chair,** Int. Conf. on Unmanned Aerial Vehicles in Geomatics (UAVg) *2017*

### Program Committee Memeberships

AAAI 2006; AMAS 2008; ECAI 2012; ECMR, since 2007, biannual; GCPR/DAGM 2021; IAS 2012; ICAR 2007-2009; INCINCO 2008; KI 2011; ROBOCOM 2007; RSS 2005-2015, 2020, 2024; SAC 2008, 2009; SC 2012, 2014;

### Reviewing

AAAI; ACCV; CogSci; CVPR; ECMR; FSR; GCPR/DAGM; HRI; IAS; IAV; ICAR; ICCV; ICRA; ICSR; IJCAI; IROS; ISER; LCN; MICAI; RSS; Robotik; SC;

### Workshop Organization

**IROS Workshop** on “Present and Future of Agricultural Robotics and Technologies: Academic and Industry Perspectives” *2023*
**ICRA Workshop** on “Agricultural Robotics and Automation” *2022*
**ICRA Workshop** on “Robotic Vision and Action in Agriculture: the Future of Agri-food Systems and its Deployment to the Real World” *2018*
**ICRA Workshop** on “What Sucks in Robotics and How to Fix It - Lessons Learned from Building Complex Systems” *2014*
**FAIM Workshop** on Cognitive Technical Systems *2014*
**RSS Workshop** on Robotic Exploration, Monitoring, and Information Collection *2013*
**ICRA Workshop** on Visual Mapping and Navigation in Outdoor Environments *2009*

## Other Reviewing Activities

**Professorships** – External Member of or Reviewer for Prof. Recruitment Committees (12 times) *2016/18-24*
**EC** – European Commission, Horizon Europe Project Reviewing *2022-24*
**DFG** – Deutsche Forschungsgemeinschaft, SFBs *2019*
**DFG** – Deutsche Forschungsgemeinschaft, SPPs *2018*
**DFG** – Deutsche Forschungsgemeinschaft, Sachbeihilfen *2014/16/18-21*
**ERC** – European Research Council, ERG Grants *2014/17/18/22*
**ESPRC** – Engineering and Physical Sciences Research Council *2018*
**FRQ** – Les Fonds de recherche du Québec, FRQNT Program *2017*
**NRFSA** – National Research Foundation South Africa *2016*
**BSF** – U.S.-Israel Binational Science Foundation *2015*
**AvH** – Alexander von Humboldt Foundation, Professorships *2014/15*
**NWO** – Netherlands Organisation for Scientific Research *2010/13*
**Microsoft** – MS Research Faculty Fellowships *2011*
**Springer** – STAR series books *2010*

# Publication List

## Peer-Reviewed Journal/Magazine Articles

[1] P.M. Blok, F. Magistri, C. Stachniss, H. Wang, J. Burridge, and W. Guo. High-Throughput 3D Shape Completion of Potato Tubers on a Harvester. *Computers and Electronics in Agriculture*, 228:109673, 2025.

[2] M. Zeller, D. Casado Herraez, B. Ayan, J. Behley, M. Heidingsfeld, and C. Stachniss. SemRaFiner: Panoptic Segmentation in Sparse and Noisy Radar Point Clouds. *IEEE Robotics and Automation Letters (RA-L)*, 2024.

[3] L. Wiesmann, T. Läbe, L. Nunes, J. Behley, and C. Stachniss. Joint Intrinsic and Extrinsic Calibration of Perception Systems Utilizing a Calibration Environment. *IEEE Robotics and Automation Letters (RA-L)*, 9(10):9103–9110, 2024.

[4] J. Weyler, F. Magistri, E. Marks, Y.L. Chong, M. Sodano, G. Roggiolani, N. Chebrolu, C. Stachniss, and J. Behley. PhenoBench: A Large Dataset and Benchmarks for Semantic Image Interpretation in the Agricultural Domain. *IEEE Trans. on Pattern Analalysis and Machine Intelligence (TPAMI)*, 2024.

[5] Y. Pan, X. Zhong, L. Wiesmann, T. Posewsky, J. Behley, and C. Stachniss. PIN-SLAM: LiDAR SLAM Using a Point-Based Implicit Neural Representation for Achieving Global Map Consistency. *IEEE Trans. on Robotics (TRO)*, 40:4045–4064, 2024.

[6] D. Casado Herraez, L. Chang, M. Zeller, L. Wiesmann, J. Behley, M. Heidingsfeld, and C. Stachniss. SPR: Single-Scan Radar Place Recognition. *IEEE Robotics and Automation Letters (RA-L)*, 9(10):9079–9086, 2024.

[7] A. Vashisth, J. Rückin, F. Magistri, C. Stachniss, and M. Popović. Deep Reinforcement Learning with Dynamic Graphs for Adaptive Informative Path Planning. *IEEE Robotics and Automation Letters (RA-L)*, 9(9):7747–7754, 2024.

[8] F. Magistri, Y. Pan, J. Bartels, J. Behley, C. Stachniss, and C. Lehnert. Improving Robotic Fruit Harvesting Within Cluttered Environments Through 3D Shape Completion. *IEEE Robotics and Automation Letters (RA-L)*, 9(8):7357–7364, 2024.

[9] J. Bömer, F. Esser, E.A. Marks, R.A. Rosu, S. Behnke, L. Klingbeil, H. Kuhlmann, C. Stachniss, A.-K. Mahlein, and S. Paulus. A 3D Printed Plant Model for Accurate and Reliable 3D Plant Phenotyping. *GigaScience*, 13:giae035, 2024.

[10] H. Storm, S.J. Seidel, L. Klingbeil, F. Ewert, H. Vereecken, W. Amelung, S. Behnke, M. Bennewitz, J. Börner, T. Döring, J. Gall, A.-K. Mahlein, C. McCool, U. Rascher, S. Wrobel, A. Schnepf, C. Stachniss, and H. Kuhlmann. Research Priorities to Leverage Smart Digital Technologies for Sustainable Crop Production. *European Journal of Agronomy*, 156:127178, 2024.

[11] H. Yin, X. Xu, S. Lu, X. Chen, R. Xiong, S. Shen, C. Stachniss, and Y. Wang. A Survey on Global LiDAR Localization: Challenges, Advances and Open Problems. *Intl. Journal of Computer Vision (IJCV)*, 2024.

[12] I. Hroob, B. Mersch, C. Stachniss, and M. Hanheide. Generalizable Stable Points Segmentation for 3D LiDAR Scan-to-Map Long-Term Localization. *IEEE Robotics and Automation Letters (RA-L)*, 9(4):3546–3553, 2024.

[13] J. Rückin, F. Magistri, C. Stachniss, and M. Popović. Semi-Supervised Active Learning for Semantic Segmentation in Unknown Environments Using Informative Path Planning. *IEEE Robotics and Automation Letters (RA-L)*, 9(3):2662–2669, 2024.

[14] M. Zeller, V.S. Sandhu, B. Mersch, J. Behley, M. Heidingsfeld, and C. Stachniss. Radar instance transformer: Reliable moving instance segmentation in sparse radar point clouds. *IEEE Trans. on Robotics (TRO)*, 40:2357–2372, 2024.

[15] J. Weyler, T. Läbe, J. Behley, and C. Stachniss. Panoptic Segmentation with Partial Annotations for Agricultural Robots. *IEEE Robotics and Automation Letters (RA-L)*, 9(2):1660–1667, 2024.

[16] C. Smitt, M.A. Halstead, P. Zimmer, T. Läbe, E. Guclu, C. Stachniss, and C.S. McCool. PAg-NeRF: Towards fast and efficient end-to-end panoptic 3D representations for agricultural robotics. *IEEE Robotics and Automation Letters (RA-L)*, 9(1):907–914, 2024.

[17] C. Gomez, A.C. Hernandez, R. Barber, and C. Stachniss. Localization exploiting semantic and metric information in non-static indoor environments. *Journal of Intelligent & Robotic Systems*, 109(86), 2023.

[18] R. Marcuzzi, L. Nunes, L. Wiesmann, E. Marks, J. Behley, and C. Stachniss. Mask4D: End-to-End Mask-Based 4D Panoptic Segmentation for LiDAR Sequences. *IEEE Robotics and Automation Letters (RA-L)*, 8(11):7487–7494, 2023.

[19] G. Roggiolani, F. Magistri, T. Guadagnino, J. Behley, and C. Stachniss. Unsupervised Pre-Training for 3D Leaf Instance Segmentation. *IEEE Robotics and Automation Letters (RA-L)*, 8:7448–7455, 2023.

[20] L. Peters, V. Rubies Royo, C. Tomlin, L. Ferranti, J. Alonso-Mora, C. Stachniss, and D. Fridovich-Keil. Online and Offline Learning of Player Objectives from Partial Observations in Dynamic Games. *The Int. Journal of Robotics Research (IJRR)*, 2023.

[21] J. Rückin, F. Magistri, C. Stachniss, and M. Popović. An informative path planning framework for active learning in uav-based semantic mapping. *IEEE Trans. on Robotics (TRO)*, 39(6):4279–4296, 2023.

[22] F. Magistri, J. Weyler, D. Gogoll, P. Lottes, J. Behley, N. Petrinic, and C. Stachniss. From one field to another – unsupervised domain adaptation for semantic segmentation in agricultural robotics. *Computers and Electronics in Agriculture*, 212:108114, 2023.

[23] Y.L. Chong, J. Weyler, P. Lottes, J. Behley, and C. Stachniss˙Unsupervised Generation of Labeled Training Images for Crop-Weed Segmentation in New Fields and on Different Robotic Platforms. *IEEE Robotics and Automation Letters (RA-L)*, 8(8):5259–5266, 2023.

[24] B. Mersch, T. Guadagnino, X. Chen, I. Vizzo, J. Behley, and C. Stachniss. Building Volumetric Beliefs for Dynamic Environments Exploiting Map-Based Moving Object Segmentation. *IEEE Robotics and Automation Letters (RA-L)*, 8(8):5180–5187, 2023.

[25] L. Wiesmann, T. Guadagnino, I. Vizzo, N. Zimmerman, Y. Pan, H. Kuang, J. Behley, and C. Stachniss. LocNDF: Neural Distance Field Mapping for Robot Localization. *IEEE Robotics and Automation Letters (RA-L)*, 8(8):4999–5006, 2023.

[26] E. Marks, M. Sodano, F. Magistri, L. Wiesmann, D. Desai, R. Marcuzzi, J. Behley, and C. Stachniss. High Precision Leaf Instance Segmentation in Point Clouds Obtained Under Real Field Conditions. *IEEE Robotics and Automation Letters (RA-L)*, 8(8):4791–4798, 2023.

[27] J. Weyler, T. Läbe, F. Magistri, J. Behley, and C. Stachniss. Towards Domain Generalization in Crop and Weed Segmentation for Precision Farming Robots. *IEEE Robotics and Automation Letters (RA-L)*, 8(6):3310–3317, 2023.

[28] I. Vizzo, T. Guadagnino, B. Mersch, L. Wiesmann, J. Behley, and C. Stachniss. KISS-ICP: In Defense of Point-to-Point ICP – Simple, Accurate, and Robust Registration If Done the Right Way. *IEEE Robotics and Automation Letters (RA-L)*, 8(2):1–8, 2023.

[29] R. Marcuzzi, L. Nunes, L. Wiesmann, J. Behley, and C. Stachniss. Mask-Based Panoptic LiDAR Segmentation for Autonomous Driving. *IEEE Robotics and Automation Letters (RA-L)*, 8(2):1141–1148, 2023.

[30] L. Wiesmann, L. Nunes, J. Behley, and C. Stachniss. KPPR: Exploiting Momentum Contrast for Point Cloud-Based Place Recognition. *IEEE Robotics and Automation Letters (RA-L)*, 8(2):592–599, 2023.

[31] H. Kuang, X. Chen, T. Guadagnino, N. Zimmerman, J. Behley, and C. Stachniss. IR-MCL: Implicit Representation-Based Online Global Localization. *IEEE Robotics and Automation Letters (RA-L)*, 8(3):1627–1634, 2023.

[32] M. Zeller, J. Behley, M. Heidingsfeld, and C. Stachniss. Gaussian Radar Transformer for Semantic Segmentation in Noisy Radar Data. *IEEE Robotics and Automation Letters (RA-L)*, 8(1):344–351, 2023.

[33] N. Zimmerman, T. Guadagnino, X. Chen, J. Behley, and C. Stachniss. Long-Term Localization using Semantic Cues in Floor Plan Maps. *IEEE Robotics and Automation Letters (RA-L)*, 8(1):176–183, 2023.

[34] M. Arora, L. Wiesmann, X. Chen, and C. Stachniss. Static Map Generation from 3D LiDAR Point Clouds Exploiting Ground Segmentation. *Journal on Robotics and Autonomous Systems (RAS)*, 159:104287, 2023.

[35] H. Dong, X. Chen, S. Särkkä, and C. Stachniss. Online Pole Segmentation on Range Images for Long-term LiDAR Localization in Urban Environments. *Journal on Robotics and Autonomous Systems (RAS)*, 159:104283, 2023.

[36] F. Stache, J. Westheider, F. Magistri, C. Stachniss, and M. Popović. Adaptive Path Planning for UAVs for Multi-Resolution Semantic Segmentation. *Journal on Robotics and Autonomous Systems (RAS)*, 159:104288, 2023.

[37] F. Magistri, E. Marks, S. Nagulavancha, I. Vizzo, T. Laebe, J. Behley, M. Halstead, C. McCool, and C. Stachniss. Contrastive 3D Shape Completion and Reconstruction for Agricultural Robots using RGB-D Frames. *IEEE Robotics and Automation Letters (RA-L)*, 7(4):10120–10127, 2022.

[38] I. Vizzo, B. Mersch, R. Marcuzzi, L. Wiesmann, , J. Behley, and C. Stachniss. Make it dense: Self-supervised geometric scan completion of sparse 3d lidar scans in large outdoor environments. *IEEE Robotics and Automation Letters (RA-L)*, 7(3):8534–8541, 2022.

[39] B. Mersch, X. Chen, I. Vizzo, L. Nunes, J. Behley, and C. Stachniss. Receding Moving Object Segmentation in 3D LiDAR Data Using Sparse 4D Convolutions. *IEEE Robotics and Automation Letters (RA-L)*, 7(3):7503–7510, 2022.

[40] T. Guadagnino, X. Chen, M. Sodano, J. Behley, G. Grisetti, and C. Stachniss. Fast Sparse LiDAR Odometry Using Self-Supervised Feature Selection on Intensity Images. *IEEE Robotics and Automation Letters (RA-L)*, 7(3):7597–7604, 2022.

[41] L. Wiesmann, T. Guadagnino, I. Vizzo, G. Grisetti, J. Behley, and C. Stachniss. DCPCR: Deep Compressed Point Cloud Registration in Large-Scale Outdoor Environments. *IEEE Robotics and Automation Letters (RA-L)*, 7(3):6327–6334, 2022.

[42] L. Nunes, X. Chen, R. Marcuzzi, A. Osep, L. Leal-Taixe, C. Stachniss, and J. Behley. Unsupervised Class-Agnostic Instance Segmentation of 3D LiDAR Data for Autonomous Vehicles. *IEEE Robotics and Automation Letters (RA-L)*, 7(4):8713–8720, 2022.

[43] X. Chen, B. Mersch, L. Nunes, R. Marcuzzi, I. Vizzo, J. Behley, and C. Stachniss. Automatic Labeling to Generate Training Data for Online LiDAR-Based Moving Object Segmentation. *IEEE Robotics and Automation Letters (RA-L)*, 7(3):6107–6114, 2022.

[44] J. Weyler, J. Quakernack, P. Lottes, J. Behley, and C. Stachniss. Joint Plant and Leaf Instance Segmentation on Field-Scale UAV Imagery. *IEEE Robotics and Automation Letters (RA-L)*, 7(2):3787–3794, 2022.

[45] L. Nunes, R. Marcuzzi, X. Chen, J. Behley, and C. Stachniss. SegContrast: 3D Point Cloud Feature Representation Learning through Self-supervised Segment Discrimination. *IEEE Robotics and Automation Letters (RA-L)*, 7(2):2116–2123, 2022.

[46] R. Marcuzzi, L. Nunes, L. Wiesmann, I. Vizzo, J. Behley, and C. Stachniss. Contrastive Instance Association for 4D Panoptic Segmentation using Sequences of 3D LiDAR Scans. *IEEE Robotics and Automation Letters (RA-L)*, 7(2):1550–1557, 2022.

[47] S. Li, X. Chen, Y. Liu, D. Dai, C. Stachniss, and J. Gall. Multi-scale Interaction for Real-time LiDAR Data Segmentation on an Embedded Platform. *IEEE Robotics and Automation Letters (RA-L)*, 7(2):738–745, 2022.

[48] I. Vizzo, T. Guadagnino, J. Behley, and C. Stachniss. Vdbfusion: Flexible and efficient tsdf integration of range sensor data. *Sensors*, 22(3), 2022.

[49] J. Behley, M. Garbade, A. Milioto, J. Quenzel, S. Behnke, J. Gall, and C. Stachniss. Towards 3d lidar-based semantic scene understanding of 3d point cloud sequences: The semantickitti dataset. *The Int. Journal of Robotics Research (IJRR)*, 40(8-9):959–967, 2021.

[50] X. Chen, T. Läbe, A. Milioto, T. Röhling, J. Behley, and C. Stachniss. OverlapNet: A Siamese Network for Computing LiDAR Scan Similarity with Applications to Loop Closing and Localization. *Autonomous Robots*, 2021.

[51] C. Shi, X. Chen, K. Huang, J. Xiao, H. Lu, and C. Stachniss. Keypoint Matching for Point Cloud Registration using Multiplex Dynamic Graph Attention Networks. *IEEE Robotics and Automation Letters (RA-L)*, 6:8221–8228, 2021.

[52] X. Chen, S. Li, B. Mersch, L. Wiesmann, J. Gall, J. Behley, and C. Stachniss. Moving Object Segmentation in 3D LiDAR Data: A Learning-based Approach Exploiting Sequential Data. *IEEE Robotics and Automation Letters (RA-L)*, 6:6529–6536, 2021.

[53] N. Chebrolu, T. Läbe, O. Vysotska, J. Behley, and C. Stachniss. Adaptive Robust Kernels for Non-Linear Least Squares Problems. *IEEE Robotics and Automation Letters (RA-L)*, 6(2):2240–2247, 2021.

[54] D. Schunck, F. Magistri, R.A. Rosu, A. Cornelißen, N. Chebrolu, S. Paulus, J. Léon, S. Behnke, C. Stachniss, H. Kuhlmann, and L. Klingbeil. Pheno4D: A spatio-temporal dataset of maize and tomato plant point clouds for phenotyping and advanced plant analysis . *PLOS ONE*, 16(8):1–18, 2021.

[55] J. Weyler, A. Milioto, T. Falck, J. Behley, and C. Stachniss. Joint Plant Instance Detection and Leaf Count Estimation for In-Field Plant Phenotyping. *IEEE Robotics and Automation Letters (RA-L)*, 6(2):3599–3606, 2021.

[56] L. Wiesmann, A. Milioto, X. Chen, C. Stachniss, and J. Behley. Deep Compression for Dense Point Cloud Maps. *IEEE Robotics and Automation Letters (RA-L)*, 6(2):2060–2067, 2021.

[57] N. Chebrolu, F. Magistri, T. Läbe, and C. Stachniss. Registration of Spatio-Temporal Point Clouds of Plants for Phenotyping. *PLOS ONE*, 16(2), 2021.

[58] F. Görlich, E. Marks, A.-K. Mahlein, K. König, P. Lottes, and C. Stachniss. UAV-Based Classification of Cercospora Leaf Spot Using RGB Images. *Drones*, 5(2), 2021.

[59] C. Stachniss. Achievements Needed for Becoming a Professor. *Academia Letters*, (281), 2021.

[60] A. Pretto, S. Aravecchia, W. Burgard, N. Chebrolu, C. Dornhege, T. Falck, F. Fleckenstein, A. Fontenla, M. Imperoli, R. Khanna, F. Liebisch, P. Lottes,

A. Milioto, D. Nardi, S. Nardi, J. Pfeifer, M. Popović, C. Potena, C. Pradalier, E. Rothacker-Feder, I. Sa, A. Schaefer, R. Siegwart, C. Stachniss, A. Walter, V. Winterhalter, X. Wu, and J. Nieto. Building an Aerial-Ground Robotics Systemfor Precision Farming: An Adaptable Solution. *IEEE Robotics & Automation Magazine*, 28(3), 2021.

[61] A. Barreto, P. Lottes, F.R. Ispizua, S. Baumgarten, N.A. Wolf, C. Stachniss, A.-K. Mahlein, and S. Paulus. Automatic uav-based counting of seedlings in sugar-beet field and extension to maize and strawberry. *Computers and Electronics in Agriculture*, 2021.

[62] X. Wu, S. Aravecchia, P. Lottes, C. Stachniss, and C. Pradalier. Robotic weed control using automated weed and crop classification. *Journal of Field Robotics*, 37:322–340, 2020.

[63] P. Lottes, J. Behley, N. Chebrolu, A. Milioto, and C. Stachniss. Robust joint stem detection and crop-weed classification using image sequences for plant-specific treatment in precision farming. *Journal of Field Robotics*, 37:20–34, 2020.

[64] P. Regier, A. Milioto, C. Stachniss, and M. Bennewitz. Classifying Obstacles and Exploiting Class Information for Humanoid Navigation Through Cluttered Environments. *The Int. Journal of Humanoid Robotics (IJHR)*, 17(02):2050013, 2020.

[65] O. Vysotska and C. Stachniss. Effective Visual Place Recognition Using Multi-Sequence Maps. *IEEE Robotics and Automation Letters (RA-L)*, 4(2):1730–1736, 2019.

[66] I. Sa, M. Popović, R. Khanna, Z. Chen, P. Lottes, F. Liebisch, J. Nieto, C. Stachniss, and R. Siegwart. Weedmap: A large-scale semantic weed mapping framework using aerial multispectral imaging and deep neural network for precision farming. *Remote Sensing*, 10(9), 2018.

[67] N. Chebrolu, T. Laebe, and C. Stachniss. Robust Long-Term Registration of UAV Images of Crop Fields for Precision Agriculture. *IEEE Robotics and Automation Letters (RA-L)*, 3(4), 2018.

[68] P. Lottes, J. Behley, A. Milioto, and C. Stachniss. Fully convolutional networks with sequential information for robust crop and weed detection in precision farming. *IEEE Robotics and Automation Letters (RA-L)*, 3(4):2870–2877, 2018.

[69] T. Naseer, W. Burgard, and C. Stachniss. Robust visual localization across seasons. *IEEE Trans. on Robotics (TRO)*, 34(2):1–14, 2018.

[70] E. Palazzolo and C. Stachniss. Effective Exploration for MAVs Based on the Expected Information Gain. *Drones*, 2(1), 2018.

[71] J. Jung, C. Stachniss, S. Ju, and J. Heo. Automated 3d volumetric reconstruction of multiple-room building interiors for as-built bim. *Advanced Engineering Informatics*, 38:811–825, 2018.

[72] L. Nardi and C. Stachniss. User preferred behaviors for robot navigation exploiting previous experiences. In *Journal on Robotics and Autonomous Systems (RAS)*, 2017.

[73] N. Chebrolu, P. Lottes, A. Schaefer, W. Winterhalter, W. Burgard, and C. Stachniss. Agricultural robot dataset for plant classification, localization and mapping on sugar beet fields. *The Int. Journal of Robotics Research (IJRR)*, 2017.

[74] J. Jung, C. Stachniss, and C. Kim. Automatic room segmentation of 3d laser data using morphological processing. *ISPRS International Journal of Geo-Information*, 2017.

[75] I. Bogoslavskyi and C. Stachniss. Efficient online segmentation for sparse 3d laser scans. *PFG – Journal of Photogrammetry, Remote Sensing and Geoinformation Science*, pages 41–52, 2017.

[76] O. Vysotska and C. Stachniss. Improving slam by exploiting building information from publicly available maps and localization priors. *PFG – Journal of Photogrammetry, Remote Sensing and Geoinformation Science*, 85(1):53–65, 2017.

[77] C. Merfels and C. Stachniss. Sensor fusion for self-localisation of automated vehicles. *PFG – Journal of Photogrammetry, Remote Sensing and Geoinformation Science*, 2017.

[78] P. Lottes, M. Hoeferlin, S. Sanders, and C. Stachniss. Effective vision-based classification for separating sugar beets and weeds for precision farming. *Journal of Field Robotics*, 34(6):1160–1178, 2017.

[79] N. Abdo, C. Stachniss, L. Spinello, and W. Burgard. Organizing objects by predicting user preferences through collaborative filtering. *The Int. Journal of Robotics Research (IJRR)*, 2016.

[80] O. Vysotska and C. Stachniss. Lazy data association for image sequences matching under substantial appearance changes. *IEEE Robotics and Automation Letters (RA-L)*, 1(1):213–220, 2016.

[81] J. Schneider, C. Stachniss, and W. Förstner. On the accuracy of dense fisheye stereo. *IEEE Robotics and Automation Letters (RA-L)*, 1(1):227–234, 2016.

[82] S. Osswald, M. Bennewitz, W. Burgard, and C. Stachniss. Speeding-up robot exploration by exploiting background information. *IEEE Robotics and Automation Letters (RA-L)*, 2016.

[83] D. Perea Ström, I. Bogoslavskyi, and C. Stachniss. Robust exploration and homing for autonomous robots. *Journal on Robotics and Autonomous Systems (RAS)*, 2016.

[84] Ch. Beekmans, J. Schneider, T. Laebe, M. Lennefer, C. Stachniss, and C. Simmer. Cloud photogrammetry with dense stereo for fisheye cameras. *Atmospheric Chemistry and Physics*, 16:14231–14248, 2016.

[85] Pratik Agarwal, Wolfram Burgard, and Cyrill Stachniss. A survey of geodetic approaches to mapping and the relationship to graph-based slam. *IEEE Robotics & Automation Magazine*, 2014.

[86] R. Kümmerle, M. Ruhnke, B. Steder, C. Stachniss, and W. Burgard. Autonomous robot navigation in highly populated pedestrian zones. *Journal of Field Robotics*, 2014.

[87] B. Frank, C. Stachniss, R. Schmedding, M. Teschner, and W. Burgard. Learning object deformation models for robot motion planning. *Journal on Robotics and Autonomous Systems (RAS)*, 2014.

[88] C. Stachniss and W. Burgard. Particle filters for robot navigation. *Foundations and Trends in Robotics*, 3(4):211–282, 2012. Published 2014.

[89] W. Burgard and C. Stachniss. Gestatten, Obelix! *Forschung – Das Magazin der Deutschen Forschungsgemeinschaft*, 1, 2013. In German, invited.

[90] D. Maier, C. Stachniss, and M. Bennewitz. Vision-based humanoid navigation using self-supervised obstacle detection. *The Int. Journal of Humanoid Robotics (IJHR)*, 2013.

[91] K.M. Wurm, C. Dornhege, B. Nebel, W. Burgard, and C. Stachniss. Coordinating heterogeneous teams of robots using temporal symbolic planning. *Autonomous Robots*, 2013.

[92] K.M. Wurm, H. Kretzschmar, R. Kümmerle, C. Stachniss, and W. Burgard. Identifying vegetation from laser data in structured outdoor environments. *Journal on Robotics and Autonomous Systems (RAS)*, 2013.

[93] A. Hornung, K.M. Wurm, M. Bennewitz, C. Stachniss, and W. Burgard. OctoMap: An efficient probabilistic 3d mapping framework based on octrees. *Autonomous Robots*, 34(3):189–206, 2013.

[94] H. Kretzschmar and C. Stachniss. Information-theoretic pose graph compression for laser-based SLAM. *The Int. Journal of Robotics Research (IJRR)*, 31(11):1219–1230, 2012.

[95] J. Sturm, C. Stachniss, and W. Burgard. A probabilistic framework for learning kinematic models of articulated objects. *Journal on Artificial Intelligence Reserach (JAIR)*, 41:477–526, 2011.

[96] G. Grisetti, R. Kümmerle, C. Stachniss, and W. Burgard. A tutorial on graph-based SLAM. *IEEE Transactions on Intelligent Transportation Systems Magazine*, 2(4):31–43, 2010.

[97] C. Plagemann, C. Stachniss, J. Hess, F. Endres, and N. Franklin. A nonparametric learning approach to range sensing from omnidirectional vision. *Journal on Robotics and Autonomous Systems (RAS)*, 58(6):762–772, 2010.

[98] H. Kretzschmar, G. Grisetti, and C. Stachniss. Lifelong map learning for graph-based SLAM in static environments. *KI – Künstliche Intelligenz (German AI Magazine)*, 24(3):199–206, 2010.

[99] K.M. Wurm, C. Stachniss, and G. Grisetti. Bridging the gap between feature- and grid-based slam. *Journal on Robotics and Autonomous Systems (RAS)*, 58(2):140 – 148, 2010.

[100] G. Grisetti, C. Stachniss, and W. Burgard. Non-linear constraint network optimization for efficient map learning. *IEEE Transactions on Intelligent Transportation Systems*, 10(3):428–439, 2009.

[101] R. Kümmerle, B. Steder, C. Dornhege, M. Ruhnke, G. Grisetti, C. Stachniss, and A. Kleiner. On measuring the accuracy of SLAM algorithms. *Autonomous Robots*, 27(4):387ff, 2009.

[102] C. Stachniss, C. Plagemann, and A.J. Lilienthal. Gas distribution modeling using sparse gaussian process mixtures. *Autonomous Robots*, 26(2):187ff, 2009.

[103] C. Stachniss, O. Martinez Mozos, and W. Burgard. Efficient exploration of unknown indoor environments using a team of mobile robots. *Annals of Mathematics and Artificial Intelligence*, 52(2):205ff, 2009.

[104] B. Steder, G. Grisetti, C. Stachniss, and W. Burgard. Visual SLAM for flying vehicles. *IEEE Trans. on Robotics (TRO)*, 24(8):1088–1093, 2008.

[105] C. Stachniss, G. Grisetti, O. Martínez-Mozos, and W. Burgard. Efficiently learning metric and topological maps with autonomous service robots. *it – Information Technology*, 49(4):232–238, 2007.

[106] G. Grisetti, G.D. Tipaldi, C. Stachniss, W. Burgard, and D. Nardi. Fast and accurate SLAM with rao-blackwellized particle filters. *Journal on Robotics and Autonomous Systems (RAS)*, 55(1):30–38, 2007.

[107] G. Grisetti, C. Stachniss, and W. Burgard. Improved techniques for grid mapping with rao-blackwellized particle filters. *IEEE Trans. on Robotics (TRO)*, 23(1):34–46, 2007.

[108] D. Sonntag, S. Stachniss-Carp, C. Stachniss, and V. Stachniss. Determination of root canal curvatures before and after canal preparation (part II): A method based on numeric calculus. *Aust Endod J*, 32:16–25, 2006.

[109] C. Stachniss, D. Hähnel, W. Burgard, and G. Grisetti. On actively closing loops in grid-based FastSLAM. *Advanced Robotics*, 19(10):1059–1080, 2005.

[110] W. Burgard, M. Moors, C. Stachniss, and F. Schneider. Coordinated multi-robot exploration. *IEEE Trans. on Robotics (TRO)*, 21(3):376–378, 2005.

[111] P. Trahanias, W. Burgard, A. Argyros, D. Hähnel, H. Baltzakis, P. Pfaff, and C. Stachniss. TOURBOT and WebFAIR: Web-operated mobile robots for tele-presence in populated exhibitions. *IEEE Robotics & Automation Magazine*, 12(2):77–89, 2005.

## Peer-Reviewed Conference Papers

[1] I.B. Opra, B. Le Dem, J. Walls, D. Lukarski, and C. Stachniss. Leveraging GNSS and Onboard Visual Data from Consumer Vehicles for Robust Road Network Estimation. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[2] L. Lobefaro, M.V.R. Malladi, T. Guadagnino, and C. Stachniss. Spatio-Temporal Consistent Mapping of Growing Plants for Agricultural Robots in the Wild. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[3] E.A. Marks, J. Bömer, F. Magistri, A. Sah, J. Behley, and C. Stachniss. BonnBeetClouds3D: A Dataset Towards Point Cloud-Based Organ-Level Phenotyping of Sugar Beet Plants Under Real Field Conditions. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[4] H. Lim, S. Jang, B. Mersch, J. Behley, H. Myung, and C. Stachniss. HeLiMOS: A Dataset for Moving Object Segmentation in 3D Point Clouds From Heterogeneous LiDAR Sensors. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[5] R. Schirmer, N. Vaskevicius, P. Biber, and C. Stachniss. Fast Global Point Cloud Registration using Semantic NDT. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[6] L. Jin, H. Kuang, Y. Pan, C. Stachniss, and M. Popović. STAIR: Semantic-Targeted Active Implicit Reconstruction. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[7] S. Pan, L. Jin, X. Huang, C. Stachniss, M. Popović, and M. Bennewitz. Exploiting Priors from 3D Diffusion Models for RGB-Based One-Shot View Planning. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2024.

[8] M. Sodano, F. Magistri, L. Nunes, J. Behley, and C. Stachniss. Open-World Semantic Segmentation Including Class Similarity. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2024.

[9] L. Nunes, R. Marcuzzi, B. Mersch, J. Behley, and C. Stachniss. Scaling Diffusion Models to Real-World 3D LiDAR Scene Completion. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2024.

[10] X. Zhong, Y. Pan, J. Behley, and C. Stachniss. 3D LiDAR Mapping in Dynamic Environments using a 4D Implicit Neural Representation. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2024.

[11] M. Zeller, Daniel Casado Herraez, J. Behley, M. Heidingsfeld, and C. Stachniss. Radar Tracker: Moving Instance Tracking in Sparse and Noisy Radar

Point Clouds. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024.

[12] Daniel Casado Herraez, M. Zeller, Le Chang, I. Vizzo, M. Heidingsfeld, and C. Stachniss. Radar-Only Odometry and Mapping for Autonomous Vehicles. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024.

[13] M.V.R. Malladi, T. Guadagnino, L. Lobefaro, M. Mattamala, H. Griess, J. Schweier, N. Chebrolu, M. Fallon, J. Behley, and C. Stachniss. Tree Instance Segmentation and Traits Estimation for Forestry Environments Exploiting LiDAR Data . In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024.

[14] F. Magistri, R. Marcuzzi, E.A. Marks, M. Sodano, J. Behley, and C. Stachniss. Efficient and Accurate Transformer-Based 3D Shape Completion and Reconstruction of Fruits for Agricultural Robots. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024.

[15] S. Gupta, T. Guadagnino, B. Mersch, I. Vizzo, and C. Stachniss. Effectively Detecting Loop Closures using Point Cloud Density Maps. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024.

[16] Y. Wu, T. Guadagnino, L. Wiesmann, L. Klingbeil, C. Stachniss, and H. Kuhlmann. LIO-EKF: High Frequency LiDAR-Inertial Odometry using Extended Kalman Filters. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2024.

[17] D. Fusaro, F. Magistri, J. Behley, A. Pretto, and C. Stachniss. Horticultural Temporal Fruit Tracking via 3D Instance Segmentation and Re-Identification. In *Proc. of the Italian Conf. on Robotics and Intelligent Machines*, 2024.

[18] L. Lobefaro, M.V.R. Malladi, O. Vysotska, T. Guadagnino, and C. Stachniss. Estimating 4D Data Associations Towards Spatial-Temporal Mapping of Growing Plants for Agricultural Robots. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2023.

[19] Y. Pan, F. Magistri, T. Läbe, E. Marks, C. Smitt, C.S. McCool, J. Behley, and C. Stachniss. Panoptic Mapping with Fruit Completion and Pose Estimation for Horticultural Robots. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2023.

[20] Y. Goel, N. Vaskevicius, L. Palmieri, N. Chebrolu, K.O. Arras, and C. Stachniss. Semantically Informed MPC for Context-Aware Robot Exploration. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2023.

[21] N. Zimmerman, M. Sodano, E. Marks, J. Behley, and C. Stachniss. Constructing Metric-Semantic Maps using Floor Plan Priors for Long-Term Indoor Localization. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2023.

[22] H. Lim, L. Nunes, B. Mersch, X. Chen, J. Behley, H. Myung, and C. Stachniss. ERASOR2: Instance-Aware Robust 3D Mapping of the Static World in Dynamic Scenes. In *Proc. of Robotics: Science and Systems (RSS)*, 2023.

[23] L. Nunes, L. Wiesmann, R. Marcuzzi, X. Chen, J. Behley, and C. Stachniss. Temporal Consistent 3D LiDAR Representation Learning for Semantic Perception in Autonomous Driving. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2023.

[24] M. Sodano, F. Magistri, T. Guadagnino, J. Behley, and C. Stachniss. Robust Double-Encoder Network for RGB-D Panoptic Segmentation. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[25] X. Zhong, Y. Pan, J. Behley, and C. Stachniss. SHINE-Mapping: Large-Scale 3D Mapping Using Sparse Hierarchical Implicit Neural Representations. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[26] S. Kelly, A. Riccardi, E. Marks, F. Magistri, T. Guadagnino, M. Chli, and C. Stachniss. Target-Aware Implicit Mapping for Agricultural Crop Inspection. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[27] A. Riccardi, S. Kelly, E. Marks, F. Magistri, T. Guadagnino, J. Behley, M. Bennewitz, and C. Stachniss. Fruit Tracking Over Time Using High-Precision Point Clouds. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[28] G. Roggiolani, M. Sodano, F. Magistri, T. Guadagnino, J. Behley, and C. Stachniss. Hierarchical Approach for Joint Semantic, Plant Instance, and Leaf Instance Segmentation in the Agricultural Domain. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[29] G. Roggiolani, F. Magistri, T. Guadagnino, G. Grisetti, C. Stachniss, and J. Behley. On Domain-Specific Pre-Training for Effective Semantic Perception in Agricultural Robotics. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[30] M. Zeller, V.S. Sandhu, B. Mersch, J. Behley, M. Heidingsfeld, and C. Stachniss. Radar Velocity Transformer: Single-scan Moving Object Segmentation in Noisy Radar Point Clouds. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[31] H. Dong, X. Chen, M. Dusmanu, V. Larsson, M. Pollefeys, and C. Stachniss. Learning-Based Dimensionality Reduction for Computing Compact and Effective Local Feature Descriptors. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2023.

[32] H. Müller, N. Zimmerman, T. Polonelli, M. Magno, J. Behley, C. Stachniss, and L. Benini. Fully On-board Low-Power Localization with Multizone Time-of-Flight Sensors on Nano-UAVs. In *Proc. of Design, Automation & Test in Europe Conference & Exhibition (DATE)*, 2023.

[33] N. Zimmerman, L. Wiesmann, T. Guadagnino, T. Läbe, J. Behley, and C. Stachniss. Robust Onboard Localization in Changing Environments Exploiting Text Spotting. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022.

[34] L. Di Giammarino, L. Brizi, T. Guadagnino, C. Stachniss, and G. Grisetti. MD-SLAM: Multi-Cue Direct SLAM. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022.

[35] Y. Pan, Y. Kompis, L. Bartolomei, R. Mascaro, C. Stachniss, and M. Chli. Voxfield: Non-Projective Signed Distance Fields for Online Planning and 3D Reconstruction. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022.

[36] J. Rückin, L. Jin, F. Magistri, C. Stachniss, and M. Popović. Informative Path Planning for Active Learning in Aerial Semantic Mapping. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022.

[37] J. Sun, Y. Wang, M. Feng, D. Wang, J. Zhao, C. Stachniss, and X. Chen. ICK-Track: A Category-Level 6-DoF Pose Tracker Using Inter-Frame Consistent Keypoints for Aerial Manipulation. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2022.

[38] L. Peters, D. Fridovich-Keil, L. Ferranti, C. Stachniss, J. Alonso-Mora, and F. Laine. Learning Mixed Strategies in Trajectory Games. In *Proc. of Robotics: Science and Systems (RSS)*, 2022.

[39] L. Wiesmann, R. Marcuzzi, C. Stachniss, and J. Behley. Retriever: Point Cloud Retrieval in Compressed 3D Maps. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2022.

[40] E. Marks, F. Magistri, and C. Stachniss. Precise 3D Reconstruction of Plants from UAV Imagery Combining Bundle Adjustment and Template Matching. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2022.

[41] J. Weyler, , F. Magistri, P. Seitz, J. Behley, and C. Stachniss. In-Field Phenotyping Based on Crop Leaf and Plant Instance Segmentation. In *Proc. of the*

*Winter Conf. on Applications of Computer Vision (WACV)*, 2022.

[42] B. Mersch, X. Chen, J. Behley, and C. Stachniss. Self-supervised Point Cloud Prediction Using 3D Spatio-temporal Convolutional Networks. In *Proc. of the Conf. on Robot Learning (CoRL)*, 2021.

[43] L. Di Giammarino, I. Aloise, C. Stachniss, and G. Grisetti. Visual Place Recognition using LiDAR Intensity Information. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2021.

[44] P. Rottmann, T. Posewsky, A. Milioto, C. Stachniss, and J. Behley. Improving Monocular Depth Estimation by Semantic Pre-training. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2021.

[45] B. Mersch, T. Höllen, K. Zhao, C. Stachniss, and R. Roscher. Maneuver-based Trajectory Prediction for Self-Driving Cars Using Spatio-Temporal Convolutional Networks. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2021.

[46] M. Zhou, X. Chen, N. Samano, C. Stachniss, and A. Calway. Efficient Localisation Using Images and OpenStreetMaps. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2021.

[47] F. Stache, J. Westheider, F. Magistri, M. Popović, and C. Stachniss. Adaptive Path Planning for UAV-based Multi-Resolution Semantic Segmentation. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, 2021.

[48] M. Arora, L. Wiesmann, X. Chen, and C. Stachniss. Static Map Construction for 3D LiDAR Point Clouds exploiting Ground Segmentation. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, 2021.

[49] H. Dong, X. Chen, and C. Stachniss. Online Range Image-based Pole Extractor for Long-term 3D LiDAR Localization in Urban Environments. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, 2021.

[50] L. Peters, D. Fridovich-Keil, V. Rubies-Royo, C.J. Tomlin, and C. Stachniss. Inferring Objectives in Continuous Dynamic Games from Noise-Corrupted Partial State Observations. In *Proc. of Robotics: Science and Systems (RSS)*, 2021.

[51] M. Aygün, A. Osep, M. Weber, M. Maximov, C. Stachniss, J. Behley, and L. Leal-Taixe. 4D Panoptic Segmentation. In *Proc. of the IEEE/CVF Conf. on Computer Vision and Pattern Recognition (CVPR)*, 2021.

[52] F. Magistri, N. Chebrolu, J. Behley, and C. Stachniss. Towards In-Field Phenotyping Exploiting Differentiable Rendering with Self-Co nsistency Loss. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021.

[53] I. Vizzo, X. Chen, N. Chebrolu, J. Behley, and C. Stachniss. Poisson Surface Reconstruction for LiDAR Odometry and Mapping. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021.

[54] J. Behley, A. Milioto, and C. Stachniss. A Benchmark for LiDAR-based Panoptic Segmentation based on KITTI. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021.

[55] X. Chen, I. Vizzo, T. Läbe, J. Behley, and C. Stachniss. Range Image-based LiDAR Localization for Autonomous Vehicles. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021.

[56] A. Reinke, X. Chen, and C. Stachniss. Simple But Effective Redundant Odometry for Autonomous Vehicles. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2021.

[57] A. Milioto, J. Behley, C. McCool, and C. Stachniss. LiDAR Panoptic Segmentation for Autonomous Driving. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2020.

[58] X. Chen, T. Läbe, L. Nardi, J. Behley, and C. Stachniss. Learning an Overlap-based Sensor Model for 3D LiDAR Localization. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2020.

[59] F. Langer, A. Milioto, A. Haag, J. Behley, and C. Stachniss. Domain Transfer for Semantic Segmentation of LiDAR Data using Deep Neural Networks. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2020.

[60] F. Magistri, N. Chebrolu, and C. Stachniss. Segmentation-Based 4D Registration of Plants Point Clouds for Phenotyping. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2020.

[61] D. Gogoll, P. Lottes, J. Weyler, N. Petrinic, and C. Stachniss. Unsupervised Domain Adaptation for Transferring Plant Classification Systems to New Field Environments, Crops, and Robots. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2020.

[62] X. Chen, T. Läbe, A. Milioto, T. Röhling, O. Vysotska, A. Haag, J. Behley, and C. Stachniss. OverlapNet: Loop Closing for LiDAR-based SLAM. In *Proc. of Robotics: Science and Systems (RSS)*, 2020.

[63] N. Chebrolu, T. Laebe, and C. Stachniss. Spatio-temporal non-rigid registration of 3d point clouds of plants. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2020.

[64] A. Ahmadi, L. Nardi, N. Chebrolu, and C. Stachniss. Visual servoing-based navigation for monitoring row-crop fields. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2020.

[65] L. Nardi and C. Stachniss. Long-term robot navigation in indoor environments estimating patterns in traversability changes. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2020.

[66] R. Sheikh, A. Milioto, P. Lottes, C. Stachniss, M. Bennewitz, and T. Schultz. Gradient and log-based active learning for semantic segmentation of crop and weed for agricultural robots. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2020.

[67] J. Quenzel, R.A. Rosu, T. Laebe, C. Stachniss, and S. Behnke. Beyond photometric consistency: Gradient-based dissimilarity for improving visual odometry and stereo matching. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2020.

[68] J. Behley, M. Garbade, A. Milioto, J. Quenzel, S. Behnke, C. Stachniss, and J. Gall. SemanticKITTI: A Dataset for Semantic Scene Understanding of LiDAR Sequences. In *Proc. of the IEEE Intl. Conf. on Computer Vision (ICCV)*, 2019.

[69] E. Palazzolo, J. Behley, P. Lottes, P. Giguere, and C. Stachniss. ReFusion: 3D Reconstruction in Dynamic Environments for RGB-D Cameras Exploiting Residuals. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2019.

[70] A. Milioto, I. Vizzo, J. Behley, and C. Stachniss. RangeNet++: Fast and Accurate LiDAR Semantic Segmentation. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2019.

[71] X. Chen, A. Milioto, E. Palazzolo, P. Giguère, J. Behley, and C. Stachniss. SuMa++: Efficient LiDAR-based Semantic SLAM. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2019.

[72] F. Yan, O. Vysotska, and C. Stachniss. Global Localization on OpenStreetMap Using 4-bit Semantic Descriptors. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, 2019.

[73] A. Milioto and C. Stachniss. Bonnet: Open-Source Training and Deployment of Semantic Segmentation CNNs for Robotics. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[74] A. Milioto, L. Mandtler, and C. Stachniss. Fast Instance and Semantic Segmentation Exploiting Local Connectivity, Metric Learning, and One-Shot Detection for Robotics . In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[75] L. Nardi and C. Stachniss. Actively Improving Robot Navigation On Different Terrains Using Gaussian Process Mixture Models. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[76] L. Nardi and C. Stachniss. Uncertainty-Aware Path Planning for Navigation on Road Networks Using Augmented MDPs . In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[77] N. Chebrolu, P. Lottes, T. Laebe, and C. Stachniss. Robot Localization Based on Aerial Images for Precision Agriculture Tasks in Crop Fields. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[78] R. Schirmer, P. Bieber, and C. Stachniss. Coverage Path Planning in Belief Space . In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[79] D. Wilbers, Ch. Merfels, and C. Stachniss. Localization with Sliding Window Factor Graphs on Third-Party Maps for Automated Driving. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[80] K. Huang, J. Xiao, and C. Stachniss. Accurate Direct Visual-Laser Odometry with Explicit Occlusion Handling and Plane Detection. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2019.

[81] D. Wilbers, L. Rumberg, and C. Stachniss. Approximating Marginalization with Sparse Global Priors for Sliding Window SLAM-Graphs. In *Proc. of the IEEE Intl. Conf. on Robotic Computing (IRC)*, 2019.

[82] D. Wilbers, Ch. Merfels, and C. Stachniss. A Comparison of Particle Filter and Graph-based Optimization for Localization with Landmarks in Automated Vehicles. In *Proc. of the IEEE Intl. Conf. on Robotic Computing (IRC)*, 2019.

[83] P. Regier, A. Milioto, P. Karkowski, C. Stachniss, and M. Bennewitz. Classifying Obstacles and Exploiting Knowledge about Classes for Efficient Humanoid Navigation. In *Proc. of the IEEE Intl. Conf. on Humanoid Robots*, 2018.

[84] P. Lottes, J. Behley, N. Chebrolu, A. Milioto, and C. Stachniss. Joint Stem Detection and Crop-Weed Classification for Plant-specific Treatment in Precision Farming. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2018.

[85] K.H. Huang and C. Stachniss. Joint Ego-motion Estimation Using a Laser Scanner and a Monocular Camera Through Relative Orientation Estimation and 1-DoF ICP. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2018.

[86] J. Behley and C. Stachniss. Efficient surfel-based slam using 3d laser range data in urban environments. In *Proc. of Robotics: Science and Systems (RSS)*, 2018.

[87] A. Milioto, P. Lottes, and C. Stachniss. Real-time Semantic Segmentation of Crop and Weed for Precision Agriculture Robots Leve raging Background Knowledge in CNNs. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, pages 2229–2235, 2018.

[88] E. Palazzolo and C. Stachniss. Fast Image-Based Geometric Change Detection Given a 3D Model. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2018.

[89] K.H. Huang and C. Stachniss. On geometric models and their accuracy for extrinsic sensor calibration. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2018.

[90] B. Della Corte, I. Bogoslavskyi, C. Stachniss, and G. Grisetti. A General Framework for Flexible Multi-Cue Photometric Point Cloud Registration. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2018.

[91] P. Lottes and C. Stachniss. Semi-supervised online visual crop and weed classification in precision farming exploiting plant arrangement. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2017.

[92] R. Schirmer, P. Biber, and C. Stachniss. Efficient path planning in belief space for safe navigation. In *Proceedings of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, 2017.

[93] I. Bogoslavskyi and C. Stachniss. Analyzing the quality of matched 3d point clouds of objects. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2017.

[94] K.H. Huang and C. Stachniss. Extrinsic multi-sensor calibration for mobile robots using the gauss-helmert model. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2017.

[95] E. Palazzolo and C. Stachniss. Information-driven autonomous exploration for a vision-based mav. In *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, volume IV-2/W3, 2017.

[96] A. Milioto, P. Lottes, and C. Stachniss. Real-time blob-wise sugar beets vs weeds classification for monitoring fields using convolutional neural networks. In *Proc. of the Intl. Conf. on Unmanned Aerial Vehicles in Geomatics*, volume IV-2/W3, 2017.

[97] J. Schneider, C. Stachniss, and W. Förstner. On the quality and efficiency of approximate solutions to bundle adjustment with epipolar and trifocal constraints. In *ISPRS Annals of Photogrammetry, Remote Sensing and Spatial Information Sciences*, volume IV-2/W3, pages 81–88, 2017.

[98] P. Lottes, R. Khanna, J. Pfeifer, R. Siegwart, and C. Stachniss. Uav-based crop and weed classification for smart farming. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2017.

[99] Ch. Beekmans, J. Schneider, T. Laebe, M. Lennefer, C. Stachniss, and C. Simmer. 3d-cloud morphology and motion from dense stereo for fisheye cameras. In *In Proc. of the Europ. Geosciences Union General Assembly (EGU)*, 2017.

[100] I. Bogoslavskyi and C. Stachniss. Fast range image-based segmentation of sparse 3d laser scans for online operation. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2016.

[101] O. Vysotska and C. Stachniss. Exploiting building information from publicly available maps in graph-based slam. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2016.

[102] Ch. Mefels and C. Stachniss. Pose fusion with chain pose graphs for automated driving. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2016.

[103] L. Nardi and C. Stachniss. Experience-based path planning for mobile robots exploiting user preferences. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2016.

[104] T. Schubert, S. Wenzel, R. Roscher, and C. Stachniss. Investigation of Latent Traces Using Infrared Reflectance Hyperspectral Imaging. In *Int. Ann. Photogramm. Remote Sens. (ISPRS'16)*, 2016.

[105] J. Schneider, C. Eling, L. Klingbeil, H. Kuhlmann, W. Förstner, and C. Stachniss. Fast and effective online pose estimation and mapping for uavs. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2016.

[106] I. Bogoslavskyi, M. Mazuran, and C. Stachniss. Robust homing for autonomous robots. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2016.

[107] P. Lottes, M. Hoeferlin, S. Sander, M. Müter, P. Schulze-Lammers, and C. Stachniss. An effective classification system for separating sugar beets and weeds for precision farming applications. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2016.

[108] C. Siedentop, V. Laukhart, B. Krastev, D. Kasper, A. Wenden, G. Breuel, and C. Stachniss. *Advanced Microsystems for Automotive Applications 2015: Smart Systems for Green and Automated Driving. Lecture Notes in Mobility.*, chapter Autonomous Parking Using Previous Paths, pages 3–14. Springer, 2016.

[109] C. Merfels, T. Riemenschneider, and C. Stachniss. Pose fusion with biased and dependent data for automated driving. In *Proc. of the Positioning and Navigation for Intelligent Transportation Systems Conference (POSNAV ITS)*, 2016.

[110] T. Naseer, M. Ruhnke, L. Spinello, C. Stachniss, and W. Burgard. Robust visual slam across seasons. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2015.

[111] D. Perea Ström, F. Nenci, and C. Stachniss. Predictive exploration considering previously mapped environments. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2015.

[112] I. Bogoslavskyi, L. Spinello, W. Burgard, and C. Stachniss. Where to park? minimizing the expected time to find a parking space. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2015.

[113] O. Vysotska, T. Naseer, L. Spinello, W. Burgard, and C. Stachniss. Efficient and effective matching of image sequences under substantial appearance changes exploiting gps prior. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2015.

[114] N. Abdo, C. Stachniss, L. Spinello, and W.Burgard. Robot, organize my shelves! tidying up objects by predicting user preferences. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, 2015.

[115] F. Nenci, L. Spinello, and C. Stachniss. Effective compression of range data streams for remote robot operations using h.264. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Chicago, USA, 2014.

[116] O. Vysotska, B. Frank, I. Ulbert, O. Paul, P. Ruther, C. Stachniss, and W. Burgard. Automatic channel selection and neural signal estimation across channels of neural probes. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Chicago, USA, 2014.

[117] V.A. Ziparo, G. Castelli, L. Van Gool, G. Grisetti, B. Leibe, M. Proesmans, and C. Stachniss. The rovina project. robots for exploration, digital preservation and visualization of archeological sites. In *Proc. of the 18th ICOMOS General Assembly and Scientific Symposium "Heritage and Landscape as Human Values"*, 2014.

[118] T. Naseer, L. Spinello, W. Burgard, and C. Stachniss. Robust visual robot localization across seasons using network flows. In *Proc. of the Conference on Advancements of Artificial Intelligence (AAAI)*, Quebec, Canada, 2014.

[119] P. Agarwal, W. Burgard, and C. Stachniss. Helmert's and bowie's geodetic mapping methods and their relation to graph-based slam. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Hong Kong, China, 2014.

[120] P. Agarwal, G. Grisetti, G.D. Tipaldi, L. Spinello, W. Burgard, and C. Stachniss. Experimental analysis of dynamic covariance scaling for robust map optimization under bad initial estimates. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Hong Kong, China, 2014.

[121] M. Mazuran, G.D. Tipaldi, L. Spinello, W. Burgard, and C. Stachniss. A statistical measure for map consistency in slam. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Hong Kong, China, 2014.

[122] S. Oßwald, H. Kretzschmar, W. Burgard, and C. Stachniss. Learning to give route directions from human demonstrations. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Hong Kong, China, 2014.

[123] N. Abdo, L. Spinello, W. Burgard, and C. Stachniss. Inferring what to imitate in manipulation actions by using a recommender system. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Hong Kong, China, 2014.

[124] S. Ito, F. Endres, M. Kuderer, G.D. Tipaldi, C. Stachniss, and W. Burgard. W-rgb-d: Floor-plan-based indoor global localization using a depth camera and wifi. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Hong Kong, China, 2014.

[125] I. Bogoslavskyi, O. Vysotska, J. Serafin, G. Grisetti, and C. Stachniss. Efficient traversability analysis for mobile robots using the kinect sensor. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, Barcelona, Spain, 2013.

[126] N. Abdo, H. Kretzschmar, L. Spinello, and C. Stachniss. Learning manipulation actions from a few demonstrations. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Karlsruhe, Germany, 2013.

[127] R. Kümmerle, M. Ruhnke, B. Steder, C. Stachniss, and W. Burgard. A navigation system for robots operating in crowded urban environments. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Karlsruhe, Germany, 2013.

[128] P. Agarwal, G.D. Tipaldi, L. Spinello, C. Stachniss, and W. Burgard. Robust map optimization using dynamic covariance scaling. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Karlsruhe, Germany, 2013.

[129] G. Grisetti, L. Iocchi, B. Leibe, V.A. Ziparo, and C. Stachniss. Digitization of inaccessible archeological sites with autonomous mobile robots. In *Conf. on Robotics Innovation for Cultural Heritage*, 2012.

[130] J. Roewekaemper, C. Sprunk, G.D. Tipaldi, C. Stachniss, P. Pfaff, and W. Burgard. On the position accuracy of mobile robot localization based on particle filters combined with scan matching. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, 2012.

[131] D. Joho, G.D. Tipaldi, N. Engelhard, C. Stachniss, and W. Burgard. Nonparametric Bayesian models for unsupervised scene analysis and reconstruction. In *Proc. of Robotics: Science and Systems (RSS)*, 2012.

[132] H. Kretzschmar, C. Stachniss, and G. Grisetti. Efficient information-theoretic graph pruning for graph-based SLAM with laser range finders. In *Proc. of*

*the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Francisco, CA, USA, 2011.

[133] K.M. Wurm, D. Hennes, D. Holz, R.B. Rusu, C. Stachniss, K. Konolige, and W. Burgard. Hierarchies of octrees for efficient 3d mapping. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Francisco, CA, USA, 2011.

[134] J. Ziegler, H. Kretzschmar, C. Stachniss, G. Grisetti, and W. Burgard. Accurate human motion capture in large areas by combining imu- and laser-based people tracking. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Francisco, CA, USA, 2011.

[135] B. Frank, C. Stachniss, N. Abdo, and W. Burgard. Efficient motion planning for manipulation robots in environments with deformable objects. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Francisco, CA, USA, 2011.

[136] D. Maier, M. Bennewitz, and C. Stachniss. Self-supervised obstacle detection for humanoid navigation using monocular vision and sparse laser data. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Shanghai, China, 2011.

[137] M. Bennewitz, D. Maier, A. Hornung, and C. Stachniss. Integrated perception and navigation in complex indoor environments. In *Proc. of the IEEE-RAS Int. Conf. on Humanoid Robots (HUMANOIDS)*, 2011.

[138] K.M. Wurm, C. Dornhege, P. Eyerich, C. Stachniss, B. Nebel, and W. Burgard. Coordinated exploration with marsupial teams of robots using temporal symbolic planning. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, 2010.

[139] J. Sturm, A. Jain, C. Stachniss, C.C. Kemp, and W. Burgard. Robustly operating articulated objects based on experience. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, 2010.

[140] B. Frank, R. Schmedding, C. Stachniss, M. Teschner, and W. Burgard. Learning the elasticity parameters of deformable objects with a manipulation robot. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Taipei, Taiwan, 2010.

[141] G. Grisetti, R. Kümmerle, C. Stachniss, U. Frese, and C. Hertzberg. Hierarchical optimization on manifolds for online 2d and 3d mapping. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Anchorage, Alaska, 2010.

[142] M. Karg, K.M. Wurm, C. Stachniss, K. Dietmayer, and W. Burgard. Consistent mapping of multistory buildings by introducing global constraints to graph-based SLAM. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Anchorage, Alaska, 2010.

[143] J. Sturm, K. Konolige, C. Stachniss, and W. Burgard. Vision-based detection for learning articulation models of cabinet doors and drawers in household environments. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Anchorage, Alaska, 2010.

[144] F. Endres, C. Plagemann, C. Stachniss, and W. Burgard. Scene analysis using latent dirichlet allocation. In *Proc. of Robotics: Science and Systems (RSS)*, Seattle, WA, USA, 2009.

[145] K.M. Wurm, R. Kümmerle, C. Stachniss, and W. Burgard. Improving robot navigation in structured outdoor environments by identifying vegetation from laser data. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, St. Louis, MO, USA, 2009.

[146] A. Schneider, J. Sturm C. Stachniss, M. Reisert, H. Burkhardt, and W. Burgard. Object identification with tactile sensors using bag-of-features. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, St. Louis, MO, USA, 2009.

[147] W. Burgard, C. Stachniss, G. Grisetti, B. Steder, R. Kümmerle, C. Dornhege, M. Ruhnke, A. Kleiner, and J.D. Tardós. Trajectory-based comparison of SLAM algorithms. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, St. Louis, MO, USA, 2009.

[148] J. Sturm, V. Predeap, C. Stachniss, C. Plagemann, K. Konolige, and W. Burgard. Learning kinematic models for articulated objects. In *Proc. of the Intl. Conf. on Artificial Intelligence (IJCAI)*, Pasadena, CA, USA, 2009.

[149] H. Strasdat, C. Stachniss, and W. Burgard. Which landmark is useful? learning selection policies for navigation in unknown environments. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Kobe, Japan, 2009.

[150] B. Frank, C. Stachniss, R. Schmedding, W. Burgard, and M. Teschner. Real-world robot navigation amongst deformable obstacles. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Kobe, Japan, 2009.

[151] M. Bennewitz, C. Stachniss, S. Behnke, and W. Burgard. Utilizing reflection properties of surfaces to improve mobile robot localization. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Kobe, Japan, 2009.

[152] C. Eppner, J. Sturm, M. Bennewitz, C. Stachniss, and W. Burgard. Imitation learning with generalized task descriptions. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Kobe, Japan, 2009.

[153] H. Kretzschmar, C. Stachniss, C. Plagemann, and W. Burgard. Estimating landmark locations from geo-referenced photographs. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Nice, France, 2008.

[154] P. Pfaff, C. Stachniss, C. Plagemann, and W. Burgard. Efficiently learning high-dimensional observation models for monte-carlo localization using gaussian mixtures. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Nice, France, 2008.

[155] K.M. Wurm, C. Stachniss, and W. Burgard. Coordinated multi-robot exploration using a segmentation of the environment. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Nice, France, 2008.

[156] C. Stachniss, C. Plagemann, A.J. Lilienthal, and W. Burgard. Gas distribution modeling using sparse gaussian process mixture models. In *Proc. of Robotics: Science and Systems (RSS)*, Zurich, Switzerland, 2008.

[157] C. Stachniss, M. Bennewitz, G. Grisetti, S. Behnke, and W. Burgard. How to learn accurate grid maps with a humanoid. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Pasadena, CA, USA, 2008.

[158] B. Frank, M. Becker, C. Stachniss, M. Teschner, and W. Burgard. Efficient path planning for mobile robots in environments with deformable objects. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Pasadena, CA, USA, 2008.

[159] C. Plagemann, F. Endres, J. Hess, C. Stachniss, and W. Burgard. Monocular range sensing: A non-parametric learning approach. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Pasadena, CA, USA, 2008.

[160] G. Grisetti, D. Lordi Rizzini, C. Stachniss, E. Olson, and W. Burgard. Online constraint network optimization for efficient maximum likelihood map learning. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Pasadena, CA, USA, 2008.

[161] J. Müller, C. Stachniss, K.O. Arras, and W. Burgard. Socially inspired motion planning for mobile robots in populated environments. In *Proc. of the Int. Conf. on Cognitive Systems (CogSys)*, 2008.

[162] C. Stachniss, G. Grisetti, N. Roy, and W. Burgard. Evaluation of gaussian proposal distributions for mapping with rao-blackwellized particle filters. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

[163] G. Grisetti, S. Grzonka, C. Stachniss, P. Pfaff, and W. Burgard. Efficient estimation of accurate maximum likelihood maps in 3d. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

[164] B. Steder, G. Grisetti, S. Grzonka, C. Stachniss, A. Rottmann, and W. Burgard. Learning maps in 3d using attitude and noisy vision sensors. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

[165] K.M. Wurm, C. Stachniss, G. Grisetti, and W. Burgard. Improved simultaneous localization and mapping using a dual representation of the environment. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, Freiburg, Germany, 2007.

[166] G. Grisetti, C. Stachniss, S. Grzonka, and W. Burgard. A tree parameterization for efficiently computing maximum likelihood maps using gradient descent. In *Proc. of Robotics: Science and Systems (RSS)*, Atlanta, GA, USA, 2007.

[167] P. Pfaff, R. Triebel, C. Stachniss, P. Lamon, W. Burgard, and R. Siegwart. Towards mapping of cities. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, Rome, Italy, 2007.

[168] A. Gil, O. Reinoso, O. Martínez-Mozos, C. Stachniss, and W. Burgard. Improving data association in vision-based SLAM. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, Beijing, China, 2006.

[169] C. Stachniss, O. Martínez-Mozos, and W. Burgard. Speeding-up multi-robot exploration by considering semantic place information. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, pages 1692–1697, Orlando, FL, USA, 2006.

[170] G. Grisetti, G.D. Tipaldi, C. Stachniss, W. Burgard, and D. Nardi. Speeding-up rao-blackwellized SLAM. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, pages 442–447, Orlando, FL, USA, 2006.

[171] M. Bennewitz, C. Stachniss, W. Burgard, and S. Behnke. Metric localization with scale-invariant visual features using a single perspective camera. In H.I. Christiensen, editor, *European Robotics Symposium 2006*, volume 22 of *STAR Springer tracts in advanced robotics*, pages 143–157. Springer-Verlag Berlin Heidelberg, Germany, 2006.

[172] C. Plagemann, C. Stachniss, and W. Burgard. Efficient failure detection for mobile robots using mixed-abstraction particle filters. In H.I. Christiensen, editor, *European Robotics Symposium 2006*, volume 22 of *STAR Springer tracts in advanced robotics*, pages 93–107. Springer-Verlag Berlin Heidelberg, Germany, 2006.

[173] D. Meier, C. Stachniss, and W. Burgard. Coordinating multiple robots during exploration under communication with limited bandwidth. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, pages 26–31, Ancona, Italy, 2005.

[174] C. Stachniss and W. Burgard. Mobile robot mapping and localization in non-static environments. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, pages 1324–1329, Pittsburgh, PA, USA, 2005.

[175] A. Rottmann, O. Martínez-Mozos, C. Stachniss, and W. Burgard. Place classification of indoor environments with mobile robots using boosting. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, pages 1306–1311, Pittsburgh, PA, USA, 2005.

[176] C. Stachniss, G. Grisetti, and W. Burgard. Information gain-based exploration using rao-blackwellized particle filters. In *Proc. of Robotics: Science and Systems (RSS)*, pages 65–72, Cambridge, MA, USA, 2005.

[177] C. Stachniss, G. Grisetti, and W. Burgard. Recovering particle diversity in a rao-blackwellized particle filter for SLAM after actively closing loops. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, pages 667–672, Barcelona, Spain, 2005.

[178] G. Grisetti, C. Stachniss, and W. Burgard. Improving grid-based SLAM with rao-blackwellized particle filters by adaptive proposals and selective resampling. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, pages 2443–2448, Barcelona, Spain, 2005.

[179] O. Martínez-Mozos, C. Stachniss, and W. Burgard. Supervised learning of places from range data using adaboost. In *Proc. of the IEEE Intl. Conf. on Robotics & Automation (ICRA)*, pages 1742–1747, Barcelona, Spain, 2005.

[180] C. Stachniss, D. Hähnel, and W. Burgard. Exploration with active loop-closing for FastSLAM. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, pages 1505–1510, Sendai, Japan, 2004.

[181] C. Stachniss and W. Burgard. Mapping and exploration with mobile robots using coverage maps. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, pages 476–481, Las Vegas, NV, USA, 2003.

[182] C. Stachniss and W. Burgard. Using coverage maps to represent the environment of mobile robots. In *Proc. of the Europ. Conf. on Mobile Robotics (ECMR)*, pages 59–64, Radziejowice, Poland, 2003.

[183] C. Stachniss and W. Burgard. Exploring unknown environments with mobile robots using coverage maps. In *Proc. of the Intl. Conf. on Artificial Intelligence (IJCAI)*, pages 1127–1132, Acapulco, Mexico, 2003.

[184] C. Stachniss and W. Burgard. An integrated approach to goal-directed obstacle avoidance under dynamic constraints for dynamic environments. In *Proc. of the IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS)*, pages 508–513, Lausanne, Switzerland, 2002.

## Peer-Reviewed Symposium/Workshop Papers

[1] J. Rückin, F. Magistriand C. Stachniss, and M. Popović. Active Learning of Robot Vision Using Adaptive Path Planning. In *Proc. of the IROS Workshop on Label Efficient Learning Paradigms for Autonomoy at Scale*, 2024.

[2] A. Narenthiran Sivakumar, M. Magistri, M. Valverde Gasparino, J. Behley, C. Stachniss, and G. Chowdhary. AdaCropFollow: Self-Supervised Online Adaptation for Visual Under-Canopy Navigation. In *Proc. of the IROS 2024 Workshop on AI and Robotics For Future Farming*, 2024.

[3] S. Pan, L. Jin, X. Huang, C. Stachniss, M. Popović, and M. Bennewitz. Exploiting Priors from 3D Diffusion Models for RGB-Based One-Shot View Planning. In *In Proc. of the ICRA Workshop On Neural Fields In Robotics (RoboNerF)*, 2024.

[4] I. Vizzo, B. Mersch, L. Nunes, L. Wiesmann, T. Guadagnino, and C. Stachniss. Toward Reproducible Version-Controlled Perception Platforms: Embracing Simplicity in Autonomous Vehicle Dataset Acquisition. In *Proc. of the Intl. Conf. on Intelligent Transportation Systems Workshops*, 2023.

[5] Y. Goel, N. Vaskevicius, L. Palmieri, N. Chebrolu, and C. Stachniss. Predicting Dense and Context-aware Cost Maps for Semantic Robot Navigation. In *IROS Workshop on Perception and Navigation for Autonomous Robotics in Unstructured and Dynamic Environments*, 2022.

[6] H. Kuang, Y. Zhu, Z. Zhang, X. Li, J. Tighe, S. Schwertfeger, C. Stachniss, and M. Li. Video Contrastive Learning With Global Context. In *Proc. of the Intl. Conf. on Computer Vision Workshops (ICCV Workshops)*, pages 3195–3204, 2021.

[7] L. Peters, D. Fridovich-Keil, V. Rubies-Royo, C.J. Tomlin, and C. Stachniss. Cost Inference in Smooth Dynamic Games from Noise-Corrupted Partial State Observations . In *Proc. of the RSS Workshop on Social Robot Navigation*, 2021.

[8] C. Carbone, D. Albani, F. Magistri, D. Ognibene, C. Stachniss, G. Kootstra, D. Nardi, and V. Trianni. Monitoring and Mapping of Crop Fields with UAV Swarms Based on Information Gain. In *Proc. of the Intl. Symp. on Distributed Autonomous Robotic Systems (DARS)*, 2021.

[9] A. Milioto and C. Stachniss. Bonnet: An Open-Source Training and Deployment Framework for Semantic Segmentation in Robotics using CNNs. In *IROS Workshop "Multimodal Robot Perception: Perception, Inference, and Learning for Joint Semantic, Geometric, and Physical Understanding"*, 2018.

[10] O. Vysotska and C. Stachniss. Relocalization under substantial appearance changes using hashing. In *IROS Workshop on Planning, Perception and Navigation for Intelligent Vehicles*, 2017.

[11] E. Palazzolo and C. Stachniss. Change detection in 3d models based on camera images. In *IROS Workshop on Planning, Perception and Navigation for Intelligent Vehicles*, 2017.

[12] F. Liebisch, M. Popović, J. Pfeifer, R. Khanna, P. Lottes, C. Stachniss, A. Pretto, S. In Kyu, J. Nieto, R. Siegwart, and A. Walter. Automatic uav-based field inspection campaigns for weeding in row crops. In *In Proc. of the 10th EARSeL SIG Imaging Spectroscopy Workshop*, 2017.

[13] F. Liebisch, J. Pfeifer, R. Khanna, P. Lottes, C. Stachniss, T. Falck, S. Sander, R. Siegwart, A. Walter, and E. Galceran. Flourish – a robotic approach for automation in crop management. In *In Proc. of the Workshop für Computer-Bildanalyse und unbemannte autonom fliegende Systeme in der Landwirtschaft*, 2016.

[14] O. Vysotska and C. Stachniss. Lazy sequences matching under substantial appearance changes. In *Workshop on Visual Place Recognition in Changing Environments at the IEEE Int. Conf. on Robotics & Automation*, 2015.

[15] C. Siedentop, R. Heinze, D. Kasper, G. Breuel, and C. Stachniss. Path-planning for autonomous parking with dubins curves. In *Proc. of the Workshop Fahrerassistenzsysteme*, 2015.

[16] P. Agarwal, G.D. Tipaldi, L. Spinello, C. Stachniss, and W. Burgard. Dynamic covariance scaling for robust robotic mapping. In *ICRA Workshop on robust and Multimodal Inference in Factor Graphs*, Karlsruhe, Germany, 2013.

[17] L. Spinello, C. Stachniss, and W. Burgard. Scene in the loop: Towards adaptation-by-tracking in rgb-d data. In *Proc. of the RSS Workshop RGB-D: Advanced Reasoning with Depth Cameras*, 2012.

[18] N. Abdo, H. Kretzschmar, and C. Stachniss. From low-level trajectory demonstrations to symbolic actions for planning. In *Proc. of the ICAPS Workshop on Combining Task and Motion Planning for Real-World Applications (TAMPRA)*, 2012.

[19] R. Kümmerle, G. Grisetti, C. Stachniss, and W. Burgard. Simultaneous parameter calibration, localization, and mapping for robust service robotics. In *Proc. of the IEEE Workshop on Advanced Robotics and its Social Impacts*, Half-Moon Bay, CA, USA, 2011.

[20] B. Frank, C. Stachniss, N. Abdo, and W. Burgard. Using gaussian process regression for efficient motion planning in environments with deformable objects. In *Proc. of the AAAI-11 Workshop on Automated Action Planning for Autonomous Mobile Robots (PAMR)*, San Francisco, CA, USA, 2011.

[21] W. Burgard, K.M. Wurm, M. Bennewitz, C. Stachniss, A. Hornung, R.B. Rusu, and K. Konolige. Modeling the world around us: An efficient 3d representation for personal robotics. In *Workshop on Defining and Solving Realistic Perception Problems in Personal Robotics at the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems*, Taipei, Taiwan, 2010.

[22] J. Sturm, K. Konolige, C. Stachniss, and W. Burgard. 3d pose estimation, tracking and model learning of articulated objects from dense depth video using projected texture stereo. In *Proc. of the Workshop RGB-D: Advanced Reasoning with Depth Cameras at Robotics: Science and Systems (RSS)*, Zaragoza, Spain, 2010.

[23] B. Frank, R. Schmedding, C. Stachniss, M. Teschner, and W. Burgard. Learning deformable object models for mobile robot path planning using depth cameras and a manipulation robot. In *Proc. of the Workshop RGB-D: Advanced Reasoning with Depth Cameras at Robotics: Science and Systems (RSS)*, Zaragoza, Spain, 2010.

[24] A. Hornung, M.Bennewitz, C. Stachniss, H. Strasdat, S. Oßwald, and W. Burgard. Learning adaptive navigation strategies for resource-constrained systems. In *Proc. of the Int. Workshop on Evolutionary and Reinforcement Learning for Autonomous Robot Systems*, Lisbon, Portugal, 2010.

[25] K.M. Wurm, A. Hornung, M. Bennewitz, C. Stachniss, and W. Burgard. OctoMap: A probabilistic, flexible, and compact 3D map representation for robotic systems. In *Proc. of the ICRA 2010 Workshop on Best Practice in 3D Perception and Modeling for Mobile Manipulation*, Anchorage, AK, USA, 2010.

[26] J. Sturm, C. Stachniss, V. Predeap, C. Plagemann, K. Konolige, and W. Burgard. Towards understanding articulated objects. In *Workshop Integrating Mobility and Manipulation at Robotics: Science and Systems (RSS)*, Seattle, WA, USA, 2009.

[27] F. Endres, J. Hess, N. Franklin, C. Plagemann, C. Stachniss, and W. Burgard. Estimating range information from monocular vision. In *Workshop Regression in Robotics - Approaches and Applications at Robotics: Science and Systems (RSS)*, Seattle, WA, USA, 2009.

[28] B. Frank, M. Becker, C. Stachniss, M. Teschner, and W. Burgard. Learning cost functions for mobile robot navigation in environments with deformable objects. In *Workshop on Path Planning on Cost Maps at the IEEE Int. Conf. on Robotics & Automation*, Pasadena, CA, USA, 2008.

[29] P. Pfaff, R. Kümmerle, D. Joho, C. Stachniss, R. Triebel, and W. Burgard. Navigation in combined outdoor and indoor environments using m ulti-level surface maps. In *Workshop on Safe Navigation in Open and Dynamic Environments a t the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

[30] B. Steder, A. Rottmann, G. Grisetti, C. Stachniss, and W. Burgard. Autonomous navigation for small flying vehicles. In *Workshop on Micro Aerial Vehicles at the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

[31] H. Strasdat, C. Stachniss, M. Bennewitz, and W. Burgard. Visual bearing-only simultaneous localization and mapping with improved feature matching. In *Fachgespraeche Autonome Mobile Systeme (AMS)*, Kaiserslautern, Germany, 2007.

[32] D. Joho, C. Stachniss, P. Pfaff, and W. Burgard. Autonomous exploration for 3d map learning. In *Fachgespraeche Autonome Mobile Systeme (AMS)*, Kaiserslautern, Germany, 2007.

[33] P. Lamon, C. Stachniss, R. Triebel, P. Pfaff, C. Plagemann, G. Grisetti, S. Kolski, W. Burgard, and R. Siegwart. Mapping with an autonomous car. In *Workshop on Safe Navigation in Open and Dynamic Environments at the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, Beijing, China, 2006.

[34] S. Kolski, D. Furgeson, C. Stachniss, and R. Siegwart. Autonomous driving in dynamic environments. In *Workshop on Safe Navigation in Open and*

*Dynamic Environments at the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, Beijing, China, 2006.

[35] D. Meier, C. Stachniss, and W. Burgard. Cooperative exploration with multiple robots using low bandwidth communication. In J. Beyerer, F. Puente León, and K.-D. Sommer, editors, *Informationsfusion in der Mess- und Sensortechnik*, pages 145–157, 2006.

## Invited/Abstract-Reviewed/Not Peer-Reveiwed Publications

[1] T. Guadagnino, B. Mersch, I. Vizzo, S. Gupta, M.V.R. Malladi, L. Lobefaro, G. Doisy, and C. Stachniss. Kinematic-ICP: Enhancing LiDAR Odometry with Kinematic Constraints for Wheeled Mobile Robots Moving on Planar Surfaces. *arXiv*, arXiv:2410.10277, 2024.

[2] F. Magistri, T. Läbe, E. Marks, S. Nagulavancha, Y. Pan, C. Smitt, L. Klingbeil, M. Halstead, H. Kuhlmann, C. McCool, J. Behley, and C. Stachniss. A Dataset and Benchmark for Shape Completion of Fruits for Agricultural Robotics. *arXiv*, arXiv:2407.13304, 2024.

[3] J. Hertzberg, B. Kisliuk, J.C. Krause, and C. Stachniss. Interview: Cyrill Stachniss' View on AI in Agriculture. *German Journal of Artificial Intelligence (KI)*, 2024.

[4] R. Roscher, L. Roth, C. Stachniss, and A. Walter. Data-Centric Digital Agriculture: A Perspective. *arXiv*, 2023.

[5] C. Stachniss, I. Vizzo, L. Wiesmann, and N. Berning. How To Setup and Run a 100% Digital Conference: DIGICROP 2020, 2020.

[6] A. Walter, R. Khanna, P. Lottes, C. Stachniss, R. Siegwart, J. Nieto, and F. Liebisch. Flourish - a robotic approach for automation in crop management. In *Proc. of the Intl. Conf. on Precision Agriculture (ICPA)*, 2018.

[7] F. Langer, L. Mandtler, A. Milioto, E. Palazzolo, and C. Stachniss. Geometrical Stem Detection from Image Data for Precision Agriculture. *arXiv*, 2018.

[8] J. Schneider, C. Stachniss, and W. Förstner. Dichtes stereo mit fisheye-kameras. In *UAV 2016 – Vermessung mit unbemannten Flugsystemen*, volume 82 of *Schriftenreihe des DVW*, pages 247–264. Wißner Verlag, 2016. Invited.

[9] C. Stachniss and H. Kretzschmar. Pose graph compression for laser-based SLAM. In *Proc. of the Int. Symposium of Robotics Research (ISRR)*, Flagstaff, AZ, USA, 2011. Invited.

[10] J. Becker, C. Bersch, D. Pangercic, B. Pitzer, T. Rühr, B. Sankaran, J. Sturm, C. Stachniss, M. Beetz, and W. Burgard. Mobile manipulation of kitchen containers. In *Proc. of the IROS'11 Workshop on Results, Challenges and Lessons Learned in Advancing Robots with a Common Platform*, San Francisco, CA, USA, 2011.

[11] J. Sturm, C. Stachniss, V. Predeap, C. Plagemann, K. Konolige, and W. Burgard. Learning kinematic models for articulated objects. In *Online Proc. of the Learning Workshop (Snowbird)*, Clearwater, FL, USA, 2009.

[12] B. Steder, G. Grisetti, S. Grzonka, C. Stachniss, and W. Burgard. Estimating consistent elevation maps using down-looking cameras and inertial sensors. In *Workshop on Robotic Perception, International Conference on Computer Vision Theory and Applications*, Funchal, Madeira, Portugal, 2008.

[13] W. Burgard, C. Stachniss, and G. Grisetti. Information gain-based exploration using rao-blackwellized particle filters. In *Proc. of the Learning Workshop (Snowbird)*, Snowbird, UT, USA, 2005.

[14] C. Stachniss, G. Grisetti, D. Hähnel, and W. Burgard. Improved rao-blackwellized mapping by adaptive sampling and active loop-closure. In *Proc. of the Workshop on Self-Organization of AdaptiVE behavior (SOAVE)*, pages 1–15, Ilmenau, Germany, 2004. Invited.

[15] C. Stachniss, D. Hähnel, and W. Burgard. Grid-based FastSLAM and exploration with active loop closing. In *Online Proc. of the Dagstuhl Seminar on Robot Navigation (Dagstuhl Seminar 03501)*, Dagstuhl, Germany, 2003.

## Books

[1] C. Stachniss. *Robotic Mapping and Exploration*, volume 55 of *STAR Springer tracts in advanced robotics*. Springer, 2009.

## Book Chapters

[1] C. Stachniss, J. Leonard, and S. Thrun. *Springer Handbook of Robotics, 2nd edition*, chapter Chapt. 46: Simultaneous Localization and Mapping. Springer, 2016.

[2] C. Stachniss. *Springer Handbook of Photogrammetry*, chapter Simultaneous Localization and Mapping. Springer, 2016. In German.

[3] S. Asadi, M. Reggente, C. Stachniss, C. Plagemann, and A.J. Lilienthal. *Intelligent Systems for Machine Olfaction: Tools and Methodologies*, chapter Statistical Gas Distribution Modelling using Kernel Methods, pages 153–179. IGI Global, 2011.

[4] J. Müller, C. Stachniss, K.O. Arras, and W. Burgard. *Cognitive Systems*, chapter Socially Inspired Motion Planning for Mobile Robots in Populated Environments. Cognitive Systems Monographs. Springer, 2010.

[5] W. Burgard, C. Stachniss, and D. Haehnel. *Autonomous Navigation in Dynamic Environments*, volume 35 of *STAR Springer tracts in advanced robotics*, chapter Mobile Robot Map Learning from Range Data in Dynamic Environments. Springer, 2007.

[6] O. Martínez-Mozos, C. Stachniss, A. Rottmann, and W. Burgard. *Robotics Research*, volume 28 of *STAR Springer tracts in advanced robotics*, chapter Using AdaBoost for Place Labelling and Topological Map Building. Springer, 2007.

## Edited Books

[1] C. Stachniss, K. Schill, and D. Uttal, editors. *Spatial Cognition VIII*. Springer, August 2012.

[2] W. Burgard, O. Brock, and C. Stachniss, editors. *Robotics: Science and Systems III*. MIT Press, March 2008.

## Theses

[1] C. Stachniss. *Spatial Modeling and Robot Navigation*. Habilitation, University of Freiburg, Department of Computer Science, 2009.

[2] C. Stachniss. *Exploration and Mapping with Mobile Robots*. PhD thesis, University of Freiburg, Department of Computer Science, 2006.

[3] C. Stachniss. Zielgerichtete Kollisionsvermeidung für mobile Roboter in dynamischen Umgebungen. Master's thesis, University of Freiburg, Department of Computer Science, 2002. In German.