Curriculum Vitae

Wolfram Burgard

August 17, 2016

Work Address:
University of Freiburg, Department of Computer Science
Georges-Köhler-Allee Geb. 079
D-79085 Freiburg, Germany
Phone: +49 761 203-8026/8006
Fax: +49 761 203-8007
Email: burgard@informatik.uni-freiburg.de
http://www.informatik.uni-freiburg.de/~burgard/

Home Address:
Lerchenstr. 35
D-79211 Denzlingen, Germany
Phone: +49 7666 610985
Mobile: +49 171 5457595
Born:
February 8, 1961, in Gelsenkirchen

Research Interests

- Robotics
- Artificial intelligence
- Autonomous intelligent/mobile systems (probabilistic algorithms, service robots, networked robots, embedded systems)
- State estimation (statistical algorithms, sensor models)

Education

- Dr. rer.-nat. (Ph.D.), University of Bonn, Germany   December 1991
  Computer Science.
- Diplom (M.Sc.), University of Dortmund, Germany   April 1987
  Computer science (major) and Mathematics (minor).
- Vordiplom (B.Sc.), University of Dortmund, Germany   March 1984
  Computer science (major), Mathematics (minor).

Academic Positions

- Full professor   2006 - today
  University of Freiburg, Department of Computer Science.
- Associate professor   1999 - 2006
  University of Freiburg, Department of Computer Science.
- Research scholar,   03-10/2002
  Carnegie Mellon University, School of Computer Science.
- Research scientist (Akad. Rat)   1991 - 1999
  University of Bonn, Department of Computer Science.
- Ph.D. student and research associate,   1990-1991
  University of Bonn, Department of Computer Science.
- Ph.D. student and research associate,   1987-1990
  University of Dortmund, Department of Computer Science.

Adjunct Positions

- Adjunct faculty member   2000 - 2005
  Carnegie Mellon University, Center of Automated Learning and Discovery (CALD).

Services in Academic Positions

- Spokesperson of the Cluster of Excellence BrainLinks-BrainTools   Oct. 2012 - today
  University of Freiburg.
- Spokesperson of the Graduate School Embedded Microsystems   Oct. 2010 - today
  University of Freiburg.
- Vice Dean of the Technical Faculty   Oct. 2010 - Sept. 2012
  University of Freiburg.
- Director of the Department of Computer Science   Sept. 2006 - Sept. 2010
  University of Freiburg.
- Dean for student affairs (Studiendekan)   Oct. 2000 - Dec. 2004
  University of Freiburg, Department of Computer Science.
- Acting Director of the Department of Computer Science   Oct. 2002 - Apr. 2003
  University of Freiburg, Department of Computer Science.
- Administrator of the Rector of the University of Freiburg for affairs of the European Commission
  (EU-Beauftragter des Rektors)   Oct. 2000 - 2004
  University of Freiburg, Department of Computer Science.
- Representative of the scientific staff,   1998-1999
  University of Bonn, Department of Computer Science.

Awards

- **euRobotics Technology Transfer Award**, 2015.
- **ERC Advanced Grant**, 2010.
- **Gottfried Wilhelm Leibniz Prize**, 2009.
- **Most Useful Contribution Award**, ROS 3D Kinect Contest, Willow Garage, 2011.
- **IROS 2010 best paper award**. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Probabilistic Rule Set Joint State Update as Approximation to the Full Joint State Estimation Applied to Multi Object Scene Analysis*, 2010.
- **UAV 2010 best paper award**. International Conference and Exhibition on Unmanned Areal Vehicles (UAV), *Towards Palm-Size Autonomous Helicopters*, 2010
- **ICRA 2009 best paper award**. IEEE International Conference on Robotics and Automation (ICRA), *Towards a Navigation System for Autonomous Indoor Flying*, 2009.
- **Most active IEEE technical committee award**. IEEE International Conference on Robotics & Automation (ICRA), 2005.
- **IROS 2004 best paper award on applications**. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Exploration with Active Loop-Closing for FastSLAM*, 2004.
- **2004 IJCAII-JAIR honorable mention award**. *Markov Localization for Mobile Robots in Dynamic Environments*, Journal of Artificial Intelligence Research (JAIR), 11, 1999.

- **INRIA-EPFL prize for the IROS 2002 best paper on Mobile Robot Navigation and Perception,**. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Mapping with mobile Robots in Populated Environments*, 2002.

- **ICRA 2000 best paper award**. IEEE International Conference on Robotics & Automation (ICRA), *A Real-Time Algorithm for Mobile Robot Mapping with Applications to Multi-Robot and 3D Mapping*, 2000.

- **AAAI 1998 outstanding paper award**. National Conference on Artificial Intelligence (AAAI), *The Interactive Museum Tour-guide Robot*, 1998.

- **DAGM 1999 outstanding paper award**. 21st Symposium on Pattern Recognition (DAGM), *Collaborative Multi-Robot Localization*, 1999.

- **IROS 1998 best paper award**. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *An Experimental Comparison of Localization Methods*, 1998.

- **KI 1998 best paper award**. 22nd German Conference on Artificial Intelligence (KI), *GOLEX - Bridging The Gap between Logic (Golog) and a Real Robot*, 1998.

- **AAAI 1994 autonomous mobile robot competition second place award**. *Clean-up an office event* of the 1994 AAAI autonomous mobile robot competition, 1994.

Other Achievements

- **Fellow** of the Institute of Electrical and Electronics Engineers (**IEEE**), 2015.

- **Member of the Akademie der Wissenschaften Leopoldina**, 2014.

- **Classic Paper Honorable Mention Award** of the Association for the Advancement of Artificial Intelligence (AAAI) for the 1996 paper *Estimating the Absolute Position of a Mobile Robot using Position Probability Grids*, 2014.

- **Best paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *An Approach to Solving Large-Scale SLAM Problems with a Small Memory Footprint*, 2014.

- **Best cognitive robotics paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *Learning to Give Route Directions from Human Demonstrations*, 2014.

- **Best student paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *Robust Map Optimization using Dynamic Covariance Scaling*, 2013.

- **Member of the Heidelberger Akademie der Wissenschaften**, 2012.

- **Fellow** of the Association for the Advancement of Artificial Intelligence (**AAAI**), 2009.

- **Fellow** of the European Coordinating Committee for Artificial Intelligence (**ECCAI**), 2008.

- **Distinguished Lecturer** of the IEEE Robotics and Automation Society, 2005-2007.

- **Best paper award finalist** of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Unsupervised learning of compact 3d models based on the detection of recurrent structures*, 2010.

- **Best cognitive robotics paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *Mapping Indoor Environments Based on Human Activity*, 2010.

- **Best student paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *Mapping Indoor Environments Based on Human Activity*, 2010.

- **Best student paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *Supervised learning of places from range data using AdaBoost*, 2005.

- **Best vision paper award finalist** of the IEEE International Conference on Robotics & Automation (ICRA), *Tracking Multiple Moving Targets with a Mobile Robot using Particle Filters and Statistical Data Association*, 2001.

- **Special track for distinguished papers** of the International Conference on Artificial Intelligence (IJCAI), *A Real-Time Algorithm for Mobile Robot Mapping with Applications to Multi-Robot and 3D Mapping*, 2001.

Projects

- **Squirrel**: Clearing clutter bit by bit, EU-IST IP, 2013-2017.

- **EUROPA2**: European Pedestrian Robot 2. EU-IST STREP, 2013-2017 (Coordinator).

- **BrainLinks-BrainTools**: Cluster of Excellence, German Research Foundation, German Research Foundation, 2012-2017.

- **Rovina**: Robots for Exploration, Digital Preservation and Visualization of Archeological Sites, EC, 2013-2015.

- **HYBRIS-C1**: Planning and Action Control under Uncertainty for Mobile Manipulation Tasks, German Research Foundation, 2012-2014.

- **Tidy-up-Robot**: Mobile Manipulation in Real-World-Environments. PR-2 Beta Program, Willow Garage, 2010-2012.

- **TAPAS**: Robotics-enabled Logistics and Assistive Services for the Transformable Factory of the Future. EU-IST STREP, 2010-2014.

- **RADHAR**: Robotic Adaptation of Robots Adapting to Humans. EU-IST STREP, 2010-2013.

- **First-MM**: Flexible Skill Acquisition and Intuitive Robot Tasking for Mobile Manipulation in the Real World. EU-IST STREP, 2010-2013 (Coordinator).

- **EUROPA**: European Pedestrian Robot. EU-IST STREP, 2009-2012 (Coordinator).

- Mobile Robot Navigation: KUKA Roboter GmbH.

- **RAWSEEDS**: Robotics Advancement through Web-publishing of Sensorial and Elaborated Extensive Data Sets. EU-IST SSA, 2006-2009.

- **SLAM**: Simultaneous Mapping and Localization, Toyota Europe, 2007-2009.

- Technology for Operations. ESA, 2007.

- Situation Recognition. Siemens AG, 2006-2008.

- **muFly**: Fully Autonomous Micro Helicopter. EU-IST STREP, 2006-2009.

- **INDIGO**: Interaction with Personality and Dialogue Enabled Robots. EU-IST STREP, 2006-2009.

- **EμS**: Graduate School Embedded Microsystems. German Research Foundation, 2005-2008.

- **CoSy**: Cognitive Systems for Cognitive Assistants. EU-IST IP, 2005-2008.

- **DESIRE**: German Service-Robotics-Initative. German Ministry for Education and Research (BMBF), 2005-2008.

- **MultiRob**: Multi-Robot-Coordination. Project within the Transegional Research Center Spatial Cognition (SFB-TR8). 2003-2014.

- **3D-Map**: Three-Dimensional Map Construction. Project within the Transegional Research Center Spatial Cognition (SFB-TR8), 2003-2014.

- **ObjectSpace**: Human and robot navigation in structured environments. Project within the Transegional Research Center Spatial Cognition (SFB-TR8), 2007-2014.

- **WEBFAIR**: Web-Based Tele-Presence on Trade-Fairs with Mobile Robots. EU-IST Project, 2001-2004.

- **TOURBOT**: Museum Tele-Presence through Robotic Avatars. EU-IST Project, 2000-2001.

- **Robotic Tele-Lab**: Ministry for Research of the state Northrhine Westfalia, 1997-1999.

- Documentation Information and Communication Technology NRW. Ministry for Research of the state Northrhine Westfalia, 1996-1997.

- Illumination Planning for Hardcoal Mines. Ruhrkohle Bergbau AG, 1990-1992.

Graduated Students

1. Dirk Hähnel, 2004
2. Maren Bennewitz, 2005
3. Cyrill Stachniss, 2006
4. Rudolph Triebel, 2007
5. Patrick Pfaff, 2008
6. Óscar Martínez Mozos, 2008
7. Christian Plagemann, 2008
8. Jürgen Sturm, 2011
9. Daniel Meyer-Delius Di Vasto, 2011
10. Slawomir Grzonka, 2011
11. Thilo Grundmann, 2012
12. Kai Wurm, 2012
13. Axel Rottmann, 2012
14. Barbara Frank, 2013
15. Rainer Kümmerle, 2013
16. Bastian Steder, 2013
17. Jörg Müller, 2013
18. Dominik Joho, 2013
19. Boris Lau, 2013
20. Maximilian Beinhofer, 2014
21. Henrik Kretschmar, 2014
22. Michael Ruhnke, 2014
23. Pratik Agarwarl, 2015
24. Jürgen Hess, 2015
25. Felix Endres, 2015

26. Markus Kuderer, 2015

27. Christoph Sprunk, 2015

Patents

- Depth image based online object detection for mobile robots

Publication List

BOOKS / PROCEEDINGS

[1] E. Prassler, R. Bischoff, W. Burgard, R. Haschke, M. Hägele, G. Lawitzky, B. Nebel, P. Plöger, U. Reiser, and M. Zöllner. *Towards Service Robots for Everyday in Environments*, volume 76 of *Springer Tracts in Advanced Robotics (STAR)*. Springer, 2012.

[2] W. Burgard, R. Dillmann, C. Plagemann, and N. Vahrenkamp, editors. *Proc. of the 10th International Conference on Intelligent Autonomous Systems (IAS)*. IOS Press, July 2008.

[3] W. Burgard, O. Brock, and C. Stachniss, editors. *Proc. of the Robotics - Science and Systems (RSS)*, 2007.

[4] G. Sukhatme, S. Schaal, D. Fox, and W. Burgard, editors. *Proc. of the Robotics - Science and Systems (RSS)*, 2006.

[5] S. Thrun, W. Burgard, and D. Fox. *Probabilistic Robotics*. MIT Press, 2005.

[6] H. Choset, K. Lynch, S. Hutchinson, G. Kantor, W. Burgard, L. Kavraki, and S. Thrun. *Principles of Robot Motion: Theory, Algorithms and Implementation*. MIT Press, 2005.

[7] A. Borkowski, W. Burgard, and P. Zingaretti, editors. *Proc. of the first European Conference on Mobile Robots (ECMR)*, 2003.

[8] W. Burgard, U. Nehmzow, S. Vestli, and G. Schweizer, editors. *Proc. of the third European Workshop on Advanced Mobile Robots (EUROBOT)*, 1999.

[9] W. Burgard, Th. Christaller, and A.B. Cremers, editors. *Proc. of the 22nd German Conference on Artificial Intelligence (KI)*, LNCS. Springer Verlag, 1999.

BOOK CHAPTERS / COLLECTIONS

[1] K.O. Arras, B. Lau, S. Grzonka, M. Luber, O. Martinez-Mozos, D. Meyer-Delius, and W. Burgard. Range-based people detection and tracking for socially enabled service robots. In E. Prassler, R. Bischoff, W. Burgard, R. Haschke, M. Hägele, G. Lawitzky, B. Nebel, P. Plöger, U. Reiser, and M. Zöllner, editors, *Towards Service Robots for Everyday in Environments*, volume 76 of *Springer Tracts in Advanced Robotics (STAR)*, pages 235–280. Springer, 2012.

[2] W. Burgard and M. Hebert. World modeling. In B. Siciliano and O. Khatib, editors, *Springer Handbook of Robotics*, chapter 36. Springer Verlag, 2008.

[3] O. Martínez Mozos, C. Stachniss, A. Rottmann, and W. Burgard. Using AdaBoost for place labeling and topological map building. In S. Thrun, R. Brooks, and H. Durrant-Whyte, editors, *Robotics Research: Results of the 12th International Symposium ISRR.*, volume 28 of *STAR Springer tracts in advanced robotics*, pages 453–472. Springer, 2007.

[4] W. Burgard, C. Stachniss, and D. Haehnel. Mobile robot map learning from range data in dynamic environments. In C. Laugier and R. Chatila, editors, *Autonomous Navigation in Dynamic Environments*, volume 35 of *STAR Springer tracts in advanced robotics*. Springer Verlag, 2007.

[5] M. Bennewitz and W. Burgard. Serviceroboter für den Pflegebereich. In Fenger, Kolb, Nikolaus, Raem, and Rychlik, editors, *Handbuch Geriatrie*. Deutsche Krankenhaus Verlagsgesellschaft mbH, Düsseldorf, 2005. In German.

[6] W. Burgard, M. Moors, and F. Schneider. Collaborative exploration of unknown environments with teams of mobile robots. In M. Beetz, J. Hertzberg, M. Ghallab, and M.E. Pollack, editors, *Advances in Plan-Based Control of Robotic Agents*, volume 2466 of *LNCS*. Springer Verlag, 2002.

[7] W. Burgard and D. Schulz. Robust visualization for web-based control of mobile robots. In K. Goldberg and R. Siegwart, editors, *Robots on the Web: Physical Interaction through the Internet*. MIT-Press, 2001.

[8] D. Fox, S. Thrun, F. Dellaert, and W. Burgard. Particle filters for mobile robot localization. In A. Doucet, N. de Freitas, and N. Gordon, editors, *Sequential Monte Carlo Methods in Practice*. Springer Verlag, New York, 2000.

[9] D. Fox, W. Burgard, H. Kruppa, and S. Thrun. Efficient multi-robot localization based on Monte Carlo approximation. In J. Hollerbach and D. Koditschek, editors, *Robotics Research: The Ninth International Symposium*. Springer-Verlag, London, 2000.

[10] A. Knoll, W. Burgard, and Th. Christaller. Robotik. In G. Görz, C.-R. Rollinger, and J. Schneeberger, editors, *Handbuch der Künstlichen Intelligenz*. Oldenbourg, 2000. In German.

[11] S. Thrun, A. Bücken, W. Burgard, D. Fox, T. Fröhlinghaus, D. Hennig, T. Hofmann, M. Krell, and T. Schimdt. Map learning and high-speed navigation in RHINO. In D. Kortenkamp, R.P. Bonasso, and R. Murphy, editors, *Artificial Intelligence and Mobile Robots*. MIT/AAAI Press, Cambridge, MA, 1998.

[12] W Burgard. Goal-directed forward chaining: A tuple-oriented bottom-up approach. In Ch. Beierle and L. Plümer, editors, *Logic Programming: Formal Methods and Practical Applications*. Elsevier Science B.V., 1995.

REFEREED JOURNAL/MAGAZINE ARTICLES

[1] Stefan Oßwald, Maren Bennewitz, Wolfram Burgard, and Cyrill Stachniss. Speeding-up robot exploration by exploiting background information. *IEEE Robotics and Automation Letters (RA-L)*, 1(2):716–723, 2016.

[2] Christoph Sprunk, Boris Lau, Patrick Pfaff, and Wolfram Burgard. An accurate and efficient navigation system for omnidirectional robots in industrial environments. *Autonomous Robots*, pages 1–21, 2016.

[3] Henrik Kretzschmar, Markus Spies, Christoph Sprunk, and Wolfram Burgard. Socially compliant mobile robot navigation via inverse reinforcement learning. *The International Journal of Robotics Research*, 2016.

[4] F. Endres, J. Hess, J. Sturm, D. Cremers, and W. Burgard. 3D mapping with an RGB-D camera. *IEEE Transactions on Robotics and Automation*, 30(1):177–187, 2014.

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

[6] P. Agarwal, W. Burgard, and C. Stachniss. A survey of geodetic approaches to mapping and the relationship to graph-based slam. *IEEE Robotics & Automation Magazine*, September 2014.

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

[8] K.M. Wurm, H. Kretzschmar, R. Kümmerle, C. Stachniss, and W. Burgard. Identifying vegetation from laser data in structured outdoor environments. *Robotics and Autonomous Systems*, 62:675–684, 2014.

[9] B. Lau, C. Sprunk, and W. Burgard. Efficient grid-based spatial representations for robot navigation in dynamic environments. *Robotics and Autonomous Systems*, 61(10):1116–1130, 2013.

[10] M. Beinhofer, J. Müller, and W. Burgard. Effective landmark placement for accurate and reliable mobile robot navigation. *Robotics and Autonomous Systems*, 61(10):1060–1069, 2013.

[11] J. Müller and W. Burgard. Efficient probabilistic localization for autonomous indoor airships using sonar, air flow, and IMU sensors. *Advanced Robotics*, 27(9):711–724, 2013.

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

[13] S. Grzonka, G. Grisetti, and W. Burgard. A Fully Autonomous Indoor Quadrotor. *IEEE Transactions on Robotics (T-RO)*, 8(1):90–100, 2 2012.

[14] S. Grzonka, A. Karwath, F. Dijoux, and W. Burgard. Activity-based Indoor Mapping and Estimation of Human Trajectories. *IEEE Transactions on Robotics (T-RO)*, 8(1):234–245, 2 2012.

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

[16] R. Kümmerle, B. Steder, C. Dornhege, A. Kleiner, G. Grisetti, and W. Burgard. Large scale graph-based SLAM using aerial images as prior information. *Journal of Autonomous Robots*, 30(1):25–39, 2011.

[17] S. Bouabdallah, C. Bermes, S. Grzonka, C. Gimkiewicz, A. Brenzikofer, R. Hahn, D. Schafroth, G. Grisetti, W. Burgard, and R. Siegwart. Towards Palm-Size Autonomous Helicopters. *Journal of Intelligent & Robotic Systems*, 61:1–27, 2011.

[18] B. Lau, K.O. Arras, and W. Burgard. Multi-model hypothesis group tracking and group size estimation. *International Journal of Social Robotics*, 2(1), 2010.

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

[20] J. Sturm, C. Plagemann, and W. Burgard. Body schema learning for robotic manipulators from visual self-perception. *Journal of Physiology*, 103(3-5):220–231, 2009.

[21] 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.

[22] M. Luber, K. Arras, C. Plagemann, and W. Burgard. Classifying dynamic objects: An unsupervised learning approach. *Autonomous Robots*, 2009.

[23] S. Grzonka, C. Plagemann, G. Grisetti, and W. Burgard. Look-ahead proposals for robust grid-based SLAM with Rao-Blackwellized particle filters. *International Journal of Robotics Research (IJRR)*, 28(2):191–200, 2009.

[24] 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*, 52:205ff, 2009.

[25] B. Steder, G. Grisetti, C. Stachniss, and W. Burgard. Visual SLAM for flying vehicles. *IEEE Transactions on Robotics*, 24(5):1088–1093, 10 2008.

[26] R. Kümmerle, R. Triebel, P. Pfaff, and W. Burgard. Monte Carlo localization in outdoor terrains using multilevel surface maps. *Journal of Field Robotics (JFR)*, 25(6-7):346–359, 2008.

[27] 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):232–237, 2007.

[28] G. Grisetti, G.D. Tipaldi, C. Stachniss, W. Burgard, and D. Nardi. Fast and accurate SLAM with Rao-Blackwellized particle filters. *Journal of Robotics & Autonomous Systems*, 55(1):30–38, 2007.

[29] P. Pfaff, R. Triebel, and W. Burgard. An efficient extension to elevation maps for outdoor terrain mapping and loop closing. *International Journal of Robotics Research (IJRR)*, 2007.

[30] G. Grisetti, C. Stachniss, and W. Burgard. Improved techniques for grid mapping with Rao-Blackwellized particle filters. *IEEE Transactions on Robotics*, 23(1):34–46, 2007.

[31] O. Martínez Mozos, R. Triebel, P. Jensfelt, A. Rottmann, and W. Burgard. Supervised semantic labeling of places using information extracted from sensor data. *Robotics and Autonomous Systems*, 55(5):391–402, May 2007.

[32] K. Kersting, C. Plagemann, A. Cocora, W. Burgard, and L. De Raedt. Learning to transfer optimal navigation policies. *Advanced Robotics. Special Issue on Imitative Robots*, 21(9), September 2007.

[33] A. Cocora, K. Kersting, C. Plagemann, W. Burgard, and L. De Raedt. Learning relational navigation policies. *KI - Künstliche Intelligenz, Themenheft Lernen und Selbstorganisation von Verhalten*, 3:12–18, 2006.

[34] C. Stachniss, D. Hähnel, W. Burgard, and G. Grisetti. On actively closing loops in grid-based FastSLAM. *Journal on Advanced Robotics*, 2005.

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

[36] J. Wolf, W. Burgard, and H. Burkhardt. Robust vision-based localization by combining an image retrieval system with Monte Carlo localization. *IEEE Transactions on Robotics*, 21(2), 2005.

[37] 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*, 2004.

[38] S. Thrun, S. Thayer, W. Whittaker, C. Baker, W. Burgard, D. Ferguson, D. Hähnel, M. Montemerlo, A. Morris, Z. Omohundro, C. Reverte, and W. Whittaker. Autonomous exploration and mapping of abandoned mines. *IEEE Robotics & Automation Magazine*, 11(4), 2005.

[39] M. Bennewitz, W. Burgard, G. Cielniak, and S. Thrun. Learning motion patterns of people for compliant robot motion. *International Journal of Robotics Research (IJRR)*, 25(1), 2005.

[40] S. Thrun, C. Martin, Y. Liu, D. Hähnel, R. Emery Montemerlo, C. Deepayan, and W. Burgard. A real-time expectation maximization algorithm for acquiring multi-planar maps of indoor environments with mobile robots. *IEEE Transactions on Robotics and Automation*, 20(3):433–442, 2004.

[41] D. Hähnel, W. Burgard, and S. Thrun. Learning compact 3d models of indoor and outdoor environments with a mobile robot. *Robotics and Autonomous Systems*, 44(1):15–27, 2003.

[42] D. Hähnel, D. Schulz, and W. Burgard. Mobile robot mapping in populated environments. *Journal of the Robotics Society of Japan (JRSJ)*, 7(17):579–598, 2003.

[43] W. Burgard, P. Trahanias, D. Hähnel, M. Moors, D. Schulz, H. Baltzakis, and A. Argyros. Telepresence in populated exhibitions through web-operated mobile robots. *Journal of Autonomous Robots*, 15:299–316, 2003.

[44] D. Schulz, W. Burgard, and A.B. Fox, D. Cremers. People tracking with a mobile robot using sample-based joint probabilistic data association filters. *International Journal of Robotics Research (IJRR)*, 22(2):99–116, 2003.

[45] M. Bennewitz, W. Burgard, and S. Thrun. Finding and optimizing solvable priority schemes for decoupled path planning techniques for teams of mobile robots. *Robotics and Autonomous Systems*, 41:89–99, 2002.

[46] D. Schulz and W. Burgard. Probabilistic state estimation of dynamic objects with a moving mobile robot. *Robotics and Autonomous Systems*, 34(2-3):107–115, 2001.

[47] S. Thrun, D. Fox, W. Burgard, and F. Dellaert. Robust Monte-Carlo localization for mobile robots. *Artificial Intelligence*, 128(1-2):99–141, 2001.

[48] M. Beetz, T. Arbuckle, Belker T., M. Bennewitz, W. Burgard, A.B. Cremers, D. Fox, H. Grosskreutz, D. Haehnel, and D. Schulz. Integrated plan-based control of autonomous service robots in human environments. *IEEE Intelligent Systems*, 16(5):56–65, 2001.

[49] D. Schulz, W. Burgard, and A.B. Cremers. State estimation techniques for 3d-visualizations of web-based tele-operated mobile robots. *KI*, 4, 2000.

[50] D. Fox, W. Burgard, H. Kruppa, and S. Thrun. A probabilistic approach to collaborative multi-robot localization. *Autonomous Robots*, 8(3), 2000.

[51] S. Thrun, M. Beetz, M. Bennewitz, W. Burgard, A.B. Cremers, F. Dellaert, D. Fox, D. Hähnel, C. Rosenberg, N. Roy, J. Schulte, and Schulz D. Probabilistic algorithms and the interactive museum tour-guide robot Minerva. *Journal of Robotics Research*, 19(11), 2000.

[52] D. Schulz, W. Burgard, D. Fox, S. Thrun, and A.B. Cremers. Web interfaces for mobile robots in public places. *IEEE-Magazine on Robotics and Automation*, 2000.

[53] W. Burgard, A.B. Cremers, D. Fox, D. Hähnel, G. Lakemeyer, D. Schulz, W. Steiner, and S. Thrun. Experiences with an interactive museum tour-guide robot. *Artificial Intelligence*, 114(1-2):3–55, 2000.

[54] D. Fox, W. Burgard, and S. Thrun. Markov localization for mobile robots in dynamic environments. *Journal of Artificial Intelligence Research (JAIR)*, 11:391–427, 1999.

[55] D. Fox, W. Burgard, and S. Thrun. Active Markov localization for mobile robots. *Robotics and Autonomous Systems*, 25:195–207, 1998.

[56] M. Beetz, W. Burgard, D. Fox, and A.B. Cremers. Integrating active localization into high-level robot control systems. *Robotics and Autonomous Systems*, 23:205–220, 1998.

[57] S. Thrun, D. Fox, and W. Burgard. A probabilistic approach to concurrent mapping and localization for mobile robots. *Machine Learning*, 31:29–53, 1998. Also appeared in *Autonomous Robots* 5, pp. 253–271, joint issue.

[58] D. Fox, W. Burgard, and S. Thrun. The dynamic window approach to collision avoidance. *IEEE Robotics & Automation Magazine*, 4(1), March 1997.

[59] W. Burgard, A.B. Cremers, D. Fox, D. Hähnel, A.M. Kappel, and S. Lüttringhaus-Kappel. Verbesserte Brandfrüherkennung im Steinkohlenbergbau durch Vorhersage von CO-Konzentrationen. In *KI Themenheft Data Mining*, volume 1. ScienTec Publishing GmbH, 1998. In German.

R<small>EFEREED</small> C<small>ONFERENCE</small> A<small>RTICLES</small>

[1] Benjamin Suger, Bastian Steder, and Wolfram Burgard. Terrain-adaptive obstacle detection. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, 2016.

[2] Tim Caselitz, Bastian Steder, Michael Ruhnke, and Wolfram Burgard. Monocular camera localization in 3d lidar maps. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2016.

[3] Oier Mees, Andreas Eitel, and Wolfram Burgard. Choosing smartly: Adaptive multimodal fusion for object detection in changing environments. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Daejeon, Korea, 2016.

[4] Ayush Dewan, Tim Caselitz, Gian Diego Tipaldi, and Wolfram Burgard. Rigid scene flow for 3d lidar scans. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016)*, Daejeon, Korea, 2016.

[5] Gabriel Oliveira, Wolfram Burgard, and Thomas Brox. Efficient deep methods for monocular road segmentation. In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2016)*, Daejeon, Korea, 2016.

[6] Lukas Luft, Tobias Schubert, Stergios I. Roumeliotis, and Wolfram Burgard. Recursive decentralized collaborative localization for sparsely communicating robots. In *Proceedings of Robotics: Science and Systems*, AnnArbor, Michigan, June 2016.

[7] Tobias Schubert, Katharina Eggensperger, Alexis Gkogkidis, Frank Hutter, Tonio Ball, and Wolfram Burgard. Automatic bone parameter estimation for skeleton tracking in optical motion capture. In *Proc. of the IEEE Int. Conf. on Robotics & Automation (ICRA)*, Stockholm, Sweden, 2016.

[8] Gabriel Oliveira, Abhinav Valada, Claas Bollen, Wolfram Burgard, and Thomas Brox. Deep learning for human part discovery in images. In *IEEE International Conference on Robotics and Automation (ICRA)*, Stockholm, Sweden, 2016.

[9] Ayush Dewan, Tim Caselitz, Gian Diego Tipaldi, and Wolfram Burgard. Motion-based detection and tracking in 3d lidar scans. In *Proc. of the IEEE Int. Conf. on Robotics & Automation (ICRA)*, Stockholm, Sweden, 2016.

[10] Noha Radwan, Gian Diego Tipaldi, Luciano Spinello, and Wolfram Burgard. Do you see the bakery? leveraging geo-referenced texts for global localization in public maps. In *Proc. of the IEEE Int. Conf. on Robotics & Automation (ICRA)*, Stockholm, Sweden, 2016.

[11] Federico Boniardi, Abhinav Valada, Wolfram Burgard, and Gian Diego Tipaldi. Autonomous indoor robot navigation using a sketch interface for drawing maps and routes. In *Proc. of the IEEE Int. Conf. on Robotics & Automation (ICRA)*, Stockholm, Sweden, 2016.

[12] Andreas Eitel, Jost Tobias Springenberg, Luciano Spinello, Martin Riedmiller, and Wolfram Burgard. Multimodal deep learning for robust rgb-d object recognition. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015.

[13] Pratik Agarwal, Wolfram Burgard, and Luciano Spinello. Metric localization using google street view. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015.

[14] Bahram Behzadian, Pratik Agarwal, Wolfram Burgard, and Gian Diego Tipaldi. Monte carlo localization in hand-drawn maps. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015.

[15] Andreas Wachaja, Pratik Agarwal, Mathias Zink, Miguel Reyes Adame, Knut Möller, and Wolfram Burgard. Navigating blind people with a smart walker. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, Hamburg, Germany, 2015.

[16] Tayyab Naseer, Michael Ruhnke, Luciano Spinello, Cyrill Stachniss, and Wolfram Burgard. Robust visual slam across seasons. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, 2015.

[17] Jörg Röwekämper, Benjamin Suger, Wolfram Burgard, and Gian Diego Tipaldi. Accurate localization with respect to moving objects via multiple-body registration. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, 2015.

[18] Wera Winterhalter, Freya Fleckenstein, Bastian Steder, Luciano Spinello, and Wolfram Burgard. Accurate indoor localization for RGB-D smartphones and tablets given 2D floor plans. In *Proc. of the IEEE Int. Conf. on Intelligent Robots and Systems (IROS)*, 2015.

[19] M. Mazuran, Ch.Sprunk, W. Burgard, and G.D. Tipaldi. LexTOR: Lexicographic teach optimize and repeat based on user preferences. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[20] S. Schröer, I. Killmann, B. Frank, M. Völker, L. D. J. Fiederer, T. Ball, and W. Burgard. An autonomous robotic assistant for drinking. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[21] B. Frank, M. Ruhnke, M. Tatarchenko, and W. Burgard. 3D-reconstruction of indoor environments from human activity. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[22] J. Röwekämper, M. Ruhnke, B. Steder, W. Burgard, and G.D. Tipaldi. Automatic extrinsic calibration of multiple laser range sensors with little overlap. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[23] P. Ruchti, B. Steder, M. Ruhnke, and W. Burgard. Localization on openstreetmap data using a 3d laser scanner. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[24] B. Suger, B. Steder, and W. Burgard. Traversability analysis for mobile robots in outdoor environments: A semi-supervised learning approach based on 3d-lidar data. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[25] B. Steder, M. Ruhnke, R. Kümmerle, and W. Burgard. Maximum likelihood remission calibration for groups of heterogeneous laser scanners. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[26] M. Kuderer, S. Gulati, and W. Burgard. Learning driving styles for autonomous vehicles from demonstration. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2015.

[27] 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 International Conference on Robotics & Automation (ICRA)*, 2015.

[28] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2014.

[29] F. Endres, C. Sprunk, R. Kümmerle, and W. Burgard. A catadioptric extension for RGB-D cameras. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2014.

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

[31] M. Mazuran, G.D. Tipaldi, L. Spinello, and W. Burgard. Nonlinear graph sparsification for slam. In *Proc. of Robotics: Science and Systems (RSS)*, 2014.

[32] 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 International Conference on Robotics & Automation (ICRA)*, 2014.

[33] P. Agarwal, W. Burgard, and C. Stachniss. Helmert's and bowie's geodetic mapping methods and their relationship to graph-based slam. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2014.

[34] M. Kuderer, C. Sprunk, H. Kretzschmar, and W. Burgard. Online generation of homotopically distinct navigation paths. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2014.

[35] H. Kretzschmar, M. Kuderer, and W. Burgard. Learning to predict trajectories of cooperatively navigating agents. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2014.

[36] E. Ilg, R. Kümmerle, W. Burgard, and T. Brox. Reconstruction of rigid body models from motion distorted laser range data using optical flow. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2014.

[37] 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 International Conference on Robotics & Automation (ICRA)*, 2014.

[38] J. Meyer, M. Kuderer, J. Müller, and W. Burgard. Online marker labeling for fully automatic skeleton tracking in optical motion caputure. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2014.

[39] 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 International Conference on Robotics & Automation (ICRA)*, 2014.

[40] 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 International Conference on Robotics & Automation (ICRA)*, 2014.

[41] B. Suger, G.D. Tipaldi, L. Spinello, and W. Burgard. An approach to solving large-scale slam problems with a small memory footprint. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2014.

[42] M. Ruhnke, L. Bo, D. Fox, and W. Burgard. Compact RGBD surface models based on sparse coding. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 2013.

[43] C. Sprunk, G.D. Tipaldi, A. Cherubini, and W. Burgard. Lidar-based teach-and-repeat of mobile robot trajectories. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2013.

[44] M. Dakulovic, C. Sprunk, L. Spinello, I. Petrovic, and W. Burgard. Efficient navigation for anyshape holonomic mobile robots in dynamic environments. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2013.

[45] J. Röwekämper, G.D. Tipaldi, and W. Burgard. Learning to guide random tree planners in high dimensional spaces. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2013.

[46] M. Kuderer, H. Kretzschmar, and W. Burgard. Teaching mobile robots to cooperatively navigate in populated environments. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2013.

[47] M. Beinhofer, J. Müller, A. Krause, and W. Burgard. Robust landmark selection for mobile robot navigation. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2013.

[48] 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 International Conference on Robotics & Automation (ICRA)*, 2013.

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

[50] J. Hess, M. Beinhofer, D. Kuhner, P. Ruchti, and W. Burgard. Poisson-driven dirt maps for efficient robot cleaning. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, pages 2245–2250, 2013.

[51] M. Kuderer, H. Kretzschmar, C. Sprunk, and W. Burgard. Feature-based prediction of trajectories for socially compliant navigation. In *Proc. of Robotics: Science and Systems (RSS)*, 2012.

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

[53] J. Röwekämper, 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 International Conference on Intelligent Robots and Systems (IROS)*, 2012.

[54] J. Hess, D. Tipaldi, and W. Burgard. Null space optimization for effective coverage of 3d surfaces using redundant manipulators. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, pages 1923–1928, 2012.

[55] M. Ruhnke, R. Kümmerle, G. Grisetti, and W. Burgard. Range sensor based model construction by sparse surface adjustment. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2012.

[56] J. Müller, O. Paul, and W. Burgard. Probabilistic velocity estimation for autonomous miniature airships using thermal air flow sensors. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2012.

[57] C. Sprunk, B. Lau, and W. Burgard. Improved non-linear spline fitting for teaching trajectories to mobile robots. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2012.

[58] A. Cunningham, K.M. Wurm, W. Burgard, and F. Dellaert. Fully distributed scalable smoothing and mapping with robust multi-robot data association. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2012.

[59] F. Endres, J. Hess, N. Engelhard, J. Sturm, D. Cremers, and W. Burgard. An evaluation of the RGB-D SLAM system. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2012.

[60] R. Kümmerle, G. Grisetti, and W. Burgard. Simultaneous calibration, localization, and mapping. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, 2011.

[61] J. Müller, N. Kohler, and W. Burgard. Autonomous miniature blimp navigation with online motion planning and re-planning. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2011.

[62] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2011.

[63] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2011.

[64] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2011.

[65] B. Steder, M. Ruhnke, S. Grzonka, and W. Burgard. Place recognition in 3D scans using a combination of bag of words and point feature based relative pose estimation. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2011.

[66] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2011.

[67] M. Ruhnke, R. Kümmerle, G. Grisetti, and W. Burgard. Highly accurate maximum likelihood laser mapping by jointly optimizing laser points and robot poses. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2011.

[68] R. Kümmerle, G. Grisetti, H. Strasdat, K. Konolige, and W. Burgard. g2o: A general framework for graph optimization. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2011.

[69] B. Steder, R.B. Rusu, K. Konolige, and W. Burgard. Point feature extraction on 3D range scans taking into account object boundaries. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2011.

[70] D. Meyer-Delius, M. Beinhofer, A. Kleiner, and W. Burgard. Using artificial landmarks to reduce the ambiguity in the environment of a mobile robot. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2011.

[71] Ch. Sprunk, B. Lau, P. Pfaff, and W. Burgard. Online generation of kinodynamic trajectories for non-circular omnidirectional robots. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2011.

[72] M. Beinhofer, J. Mueller, and W. Burgard. Near-optimal landmark selection for mobile robot navigation. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2011.

[73] Th. Grundmann, M. Fiegert, and W. Burgard. Probabilistic rule set joint state update as approximation to the full joint state estimation applied to multi object scene analysis. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[74] J. Sturm, A. Jain, C. Stachniss, C. Kemp, and W. Burgard. Operating articulated objects based on experience. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[75] Boris Lau, Christoph Sprunk, and Wolfram Burgard. Improved updating of euclidean distance maps and voronoi diagrams. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[76] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[77] K.M. Wurm, Ch. 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 International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[78] M. Ruhnke, B. Steder, G. Grisetti, and W. Burgard. Unsupervised learning of compact 3d models based on the detection of recurrent structures. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[79] K. Konolige, G. Grisetti, R. Kümmerle, W. Burgard, B. Limketkai, and R. Vincent. Sparse pose adjustment for 2d mapping. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2010.

[80] S. Grzonka, F. Dijoux, A. Karwath, and W. Burgard. Mapping indoor environments based on human activity. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2010.

[81] 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 International Conference on Robotics & Automation (ICRA)*, 2010.

[82] 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 International Conference on Robotics & Automation (ICRA)*, 2010.

[83] B. Steder, G. Grisetti, and W. Burgard. Robust place recognition for 3D range data based on point features. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2010.

[84] J. Müller, C. Gonsior, and W. Burgard. Improved monte carlo localization of autonomous robots through simultaneous estimation of motion model parameters. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2010.

[85] D. Joho and W. Burgard. Searching for objects: Combining multiple cues to object locations using a maximum entropy model. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2010.

[86] S. Bouabdallah, C. Bermes, S. Grzonka, C. Gimkiewicz, A. Brenzikofer, R. Hahn, D. Schafroth, G. Grisetti, W. Burgard, and R. Siegwart. Towards palm-size autonomous helicopters. In *International Conference and Exhibition on Unmanned Areal Vehicles (UAV)*, 2010.

[87] W. Burgard, C. Stachniss, G. Grisetti, B. Steder, R. Kümmerle, C. Dornhege, M. Ruhnke, A. Kleiner, and Juan D. Tardós. A comparison of SLAM algorithms based on a graph of relations. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009.

[88] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2009.

16

[89] K.M. Wurm, R Kuemmerle, C. Stachniss, and W. Burgard. Improving robot navigation in structured outdoor environments by identifying vegetation from laser data. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009.

[90] B. Steder, G. Grisetti, M. Van Loock, and W. Burgard. Robust on-line model-based object detection from range images. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009.

[91] D. Meyer-Delius, J. Sturm, and W. Burgard. Regression-based online situation recognition for vehicular traffic scenarios. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009.

[92] A. Hornung, H. Strasdat, M. Bennewitz, and W. Burgard. Learning efficient policies for vision-based navigation. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2009.

[93] F. Enders, C. Plagemann, C. Stachniss, and W. Burgard. Scene analysis using latent Dirichlet allocation. In *Proc. of Robotics: Science and Systems (RSS)*, 2009.

[94] R. Kümmerle, B. Steder, C. Dornhege, A. Kleiner, G. Grisetti, and W. Burgard. Large scale graph-based SLAM using aerial images as prior information. In *Proc. of Robotics: Science and Systems (RSS)*, 2009.

[95] J. Sturm, V. Predeap, C. Stachniss, C. Plagemann, K. Konolige, and W. Burgard. Learning kinematic models for articulated objects. In *Proc. of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2009.

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

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

[98] A. Pretto, E. Menegatti, M. Bennewitz, W. Burgard, and E. Pagello. A visual odometry framework robust to motion blur. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

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

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

[101] J. Müller, A. Rottmann, L.M. Reindl, and W. Burgard. A probabilistic sonar sensor model for robust localization of a small-size blimp in indoor environments using a particle filter. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[102] A. Rottmann and W. Burgard. Adaptive autonomous control using online value iteration with gaussian processes. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[103] R. Kümmerle, D. Hähnel, D. Dolgov, S. Thrun, and W. Burgard. Autonomous driving in a multi-level parking structure. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[104] M. Ruhnke, B. Steder, G. Grisetti, and W. Burgard. Unsupervised learning of 3d object models from partial views. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[105] D. Joho, C. Plagemann, and W. Burgard. Modeling RFID signal strength and tag detection for localization and mapping. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[106] D. Meyer-Delius, C. Plagemann, and W. Burgard. Probabilistic situation recognition and its application to vehicular traffic situations. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[107] S. Grzonka, G. Grisetti, and W. Burgard. Towards a navigation system for autonomous indoor flying. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[108] B. Lau, K.O. Arras, and W. Burgard. Tracking groups of people with a multi-model hypothesis tracker. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2009.

[109] C. Plagemann, K. Kersting, and W. Burgard. Nonstationary gaussian process regression using point estimates of local smoothness. In *Proc. of the European Conference on Machine Learning (ECML)*, 2008.

[110] C. Plagemann, S. Mischke, S. Prentice, K. Kersting, N. Roy, and W. Burgard. Learning predictive terrain models for legged robot locomotion. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2008.

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

[112] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2008.

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

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

[115] J. Sturm, C. Plagemann, and W. Burgard. Adaptive body scheme models for robust robotic manipulation. In *Proc. of Robotics: Science and Systems (RSS)*, 2008.

[116] M. Luber, K. Arras, C. Plagemann, and W. Burgard. Tracking and classification of dynamic objects: An unsupervised learning approach. In *Proc. of Robotics: Science and Systems (RSS)*, 2008.

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

[118] J. Sturm, C. Plagemann, and W. Burgard. Unsupervised body scheme learning through self-perception. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2008.

[119] P. Pfaff, C. Plagemann, and W. Burgard. Gaussian mixture models for probabilistic localization. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2008.

[120] 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 International Conference on Robotics & Automation (ICRA)*, 2008.

[121] 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 International Conference on Robotics & Automation (ICRA)*, 2008.

[122] 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 International Conference on Robotics & Automation (ICRA)*, 2008.

[123] K. Arras, S. Grzonka, M. Luber, and W. Burgard. Efficient people tracking in laser range data using a multi-hypothesis leg-tracker with adaptive occlusion probabilities. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2008.

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

[125] 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 International Conference on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

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

[127] A. Rottmann, C. Plagemann, P. Hilgers, and W. Burgard. Autonomous blimp control using model-free reinforcement learning in a continuous state and action space. In *Proc. of the IEEE/RSJ Int. Conf. on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, October 2007.

[128] P. Pfaff, C. Plagemann, and W. Burgard. Improved likelihood models for probabilistic localization based on range scans. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, San Diego, CA, USA, 2007.

[129] K. Kersting, C. Plagemann, P. Pfaff, and W. Burgard. Most likely heteroscedastic gaussian process regression. In *International Conference on Machine Learning (ICML)*, Corvallis, Oregon, USA, March 2007.

[130] 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.

[131] T. Lang, C. Plagemann, and W. Burgard. Adaptive non-stationary kernel regression for terrain modeling. In *Robotics: Science and Systems (RSS)*, Atlanta, Georgia, USA, June 2007.

[132] C. Plagemann, K. Kersting, P. Pfaff, and W. Burgard. Gaussian beam processes: A nonparametric bayesian measurement model for range finders. In *Robotics: Science and Systems (RSS)*, Atlanta, Georgia, USA, June 2007.

[133] H. Zender, P. Jensfelt, O. Martínez Mozos, G.M. Kruijff, and W. Burgard. An integrated robotic systen for spatial understanding and situated interaction in indoor environments. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 2007.

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

[135] K.O. Arras, O. Martínez Mozos, and W. Burgard. Using boosted features for the detection of people in 2d range data. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2007.

[136] C. Plagemann, D. Fox, and W. Burgard. Efficient failure detection on mobile robots using particle filters with gaussian process proposals. In *Proc. of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2007.

[137] R. Triebel, R. Schmidt, O. Martínez Mozos, and W. Burgard. Instace-based amn classification for improved object recognition in 2d and 3d laser range data. In *Proc. of the Twentieth International Joint Conference on Artificial Intelligence (IJCAI)*, pages 2225–2230, Hyderabad, India, 2007.

[138] S. Grzonka, C. Plagemann, G. Grisetti, and W. Burgard. Look-ahead proposals for robust grid-based SLAM. In *Proc. of the Int. Conf. on Field and Service Robotics (FSR)*, 2007.

[139] R. Kümmerle, R. Triebel, P. Pfaff, and W. Burgard. Monte carlo localization in outdoor terrains using multi-level surface maps. In *Proc. of the Int. Conf. on Field and Service Robotics (FSR)*, 2007.

[140] R. Triebel, P. Pfaff, and W. Burgard. Multi-level surface maps for outdoor terrain mapping and loop closing. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2006.

[141] A. Gil, O. Reinoso, W. Burgard, C. Stachniss, and O. Martínez Mozos. Improving data association in rao-blackwellized visual SLAM. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2006.

[142] A. Cocora, K. Kersting, C. Plagemann, W. Burgard, and L. De Raedt. Learning relational navigation policies. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2006.

[143] M. Mucientes and W. Burgard. Multi-hypothesis tracking of clusters of people. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2006.

[144] G. Grisetti, G.D. Tipaldi, C. Stachniss, W. Burgard, and D. Nardi. Speeding-up Rao-Blackwellized SLAM. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2006.

[145] C. Stachniss, O. Martínez Mozos, and W. Burgard. Speeding-up multi-robot exploration by considering semantic place information. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2006.

[146] R. Triebel, K. Kersting, and W. Burgard. Robust 3d scan point classification using associative markov networks. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2006.

[147] C. Plagemann, C. Stachniss, and W. Burgard. Efficient failure detection for mobile robots using mixed-abstraction particle filters. In *European Robotics Symposium (EUROS)*, 2006.

[148] M. Bennewitz, C. Stachniss, W. Burgard, and S. Behnke. Metric localization with scale-invariant visual features using a single perspective camera. In *European Robotics Symposium (EUROS)*, 2006.

[149] P. Pfaff, W. Burgard, and D. Fox. Robust monte-carlo localization using adaptive likelihood models. In *European Robotics Symposium (EUROS)*, 2006.

[150] C. Stachniss, G. Grisetti, and W. Burgard. Information gain-based exploration using rao-blackwellized particle filters. In *Proc. of Robotics: Science and Systems (RSS)*, 2005.

20

[151] 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)*, 2005.

[152] C. Stachniss and W. Burgard. Mobile robot mapping and localization in non-static environments. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 2005.

[153] R. Triebel and W. Burgard. Improving simultaneous localization and mapping in 3d using global constraints. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 2005.

[154] O. Martínez Mozos, C. Stachniss, and W. Burgard. Supervised learning of places from range data using AdaBoost. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2005.

[155] 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 International Conference on Robotics & Automation (ICRA)*, 2005.

[156] 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 International Conference on Robotics & Automation (ICRA)*, 2005.

[157] R. Triebel, F. Dellaert, and W. Burgard. Using hierarchical EM to extract planes from 3D range scans. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2005.

[158] P. Pfaff and W. Burgard. An efficient extension of elevation maps for outdoor terrain mapping. In *Proc. of the Int. Conf. on Field and Service Robotics (FSR)*, 2005.

[159] M. Veeck and W. Burgard. Learning polyline maps from range scan data acquired with mobile robots. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2004.

[160] C. Stachniss and W. Burgard. Exploration with active loop-closing for FastSLAM. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2004.

[161] D. Hähnel, W. Burgard, D. Fox, K. Fishkin, and M. Philipose. Mapping and localization with RFID technology. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2004.

[162] D. Ferguson, A. Morris, D. Hähnel, C. Baker, Z. Omohundro, C. Reverte, S. Thayer, W. Whittaker, W. Whittaker, W. Burgard, and Thrun S. An autonomous robotic system for mapping abandoned mines. In *Proc. of the Conference on Neural Information Processing (NIPS)*, 2003.

[163] C. Stachniss and W. Burgard. Mapping and exploration with mobile robots using coverage maps. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2003.

[164] D. Hähnel, W. Burgard, D. Fox, and S. Thrun. A highly efficient FastSLAM algorithm for generating cyclic maps of large-scale environments from raw laser range measurements. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2003.

[165] C. Stachniss and W. Burgard. Exploring unknown environments with mobile robots using coverage maps. In *Proc. of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2003.

[166] G. Cielniak, M. Bennewitz, and W. Burgard. Where is ...? learning and utilizing motion patterns of persons with mobile robots. In *Proc. of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2003.

21

[167] D. Hähnel, S. Thrun, and W. Burgard. An extension of the ICP algorithm for modeling non-rigid objects with mobile robots. In *Proc. of the International Joint Conference on Artificial Intelligence (IJCAI)*, 2003.

[168] M. Bennewitz, W. Burgard, and S. Thrun. Adapting navigation strategies using motions patterns of people. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2003.

[169] D. Hähnel, R. Triebel, W. Burgard, and S. Thrun. Map building with mobile robots in dynamic environments. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2003.

[170] S. Thrun, D. Ferguson, D. Hähnel, M. Montemerlo, R. Triebel, and W. Burgard. A system for volumetric robotic mapping of abandoned mines. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2003.

[171] M. Bennewitz, W. Burgard, and S. Thrun. Adapting navigation strategies using motions patterns of people. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2003.

[172] S. Thrun, D. Hähnel, D. Ferguson, M. Montemerlo, R. Triebel, W. Burgard, C. Bakery, Z. Omohundory, S. Thayery, and W. Whittaker. A system for volumetric robotic mapping of abandoned mines. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2003.

[173] P. Trahanias, W. Burgard, D. Hähnel, M. Moors, D. Schulz, H. Baltzakis, and A. Argyros. Interactive tele-presence in populated exhibitions through Web-operated robots. In *Proc. of the International Conference on Advanced Robotics (ICAR)*, 2003.

[174] J. Blanco, W. Burgard, R. Sanz, and J.L. Fernandez. Fast face detection for mobile robots by integrating laser range data with vision. In *Proc. of the International Conference on Advanced Robotics (ICAR)*, 2003.

[175] D. Hähnel, D. Schulz, and W. Burgard. Map building with mobile robots in populated environments. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2002.

[176] M. Bennewitz, W. Burgard, and S. Thrun. Using EM to learn motion behaviors of persons with mobile robots. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2002.

[177] 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 International Conference on Intelligent Robots and Systems (IROS)*, 2002.

[178] J. Wolf, W. Burgard, and H. Burkhardt. Using an image retrieval system for vision-based mobile robot localization. In *Proc. of the International Conference on Image and Video Retrieval (CIVR)*, 2002.

[179] M. Bennewitz, W. Burgard, and S. Thrun. Learning motion patterns of persons for mobile service robots. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2002.

[180] J. Wolf, W. Burgard, and H. Burkhardt. Robust vision-based localization for mobile robots using an image retrieval system based on invariant features. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2002.

[181] D. Schulz, W. Burgard, D. Fox, and A.B. Cremers. Tracking multiple moving objects with a mobile robot. In *Proc. of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, 2001.

[182] M. Bennewitz, W. Burgard, and S. Thrun. Exploiting constraints during prioritized path planning for teams of mobile robots. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2001.

[183] Y. Liu, R. Emery, D. Chakrabarti, W. Burgard, and S. Thrun. Using EM to learn 3D models of indoor environments with mobile robots. In *Proc. of the International Conference on Machine Learning (ICML)*, 2001.

[184] M. Bennewitz, W. Burgard, and S. Thrun. Constraint-based optimization of priority schemes for decoupled path planning techniques. In *Proc. of the 24th German / 9th Austrian Conference on Artificial Intelligence (KI)*. Springer Verlag, 2001.

[185] D. Schulz, W. Burgard, D. Fox, and A.B. Cremers. Tracking multiple moving targets with a mobile robot using particle filters and statistical data association. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2001.

[186] M. Bennewitz, W. Burgard, and S. Thrun. Optimizing schedules for prioritized path planning of multi-robot systems. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2001.

[187] W. Burgard, M. Moors, D. Fox, R. Simmons, and S. Thrun. Collaborative multi-robot exploration. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2000.

[188] R. Simmons, D. Apfelbaum, W. Burgard, D. Fox, M. Moors, S. Thrun, and H. Younes. Coordination for multi-robot exploration and mapping. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 2000.

[189] S. Thrun, D. Fox, and W. Burgard. Monte Carlo localization with mixture proposal distributions. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 2000.

[190] S. Thrun, W. Burgard, and D. Fox. A real-time algorithm for mobile robot mapping with applications to multi-robot and 3d mapping. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 2000.

[191] D. Fox, W. Burgard, H. Kruppa, and S. Thrun. Collaborative multi-robot localization. In *Proc. of the German Conference on Artificial Intelligence (KI), Germany*. Springer Verlag, 1999.

[192] D. Fox, W. Burgard, F. Dellaert, and S. Thrun. Monte Carlo Localization: Efficient position estimation for mobile robots. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 1999.

[193] S. Thrun, M. Bennewitz, W. Burgard, A.B. Cremers, F. Dellaert, D. Fox, D. Hähnel, C. Rosenberg, N. Roy, J. Schulte, D. Schulz, and W. Steiner. Experiences with two deployed interactive tour-guide robots. In *Proc. of the International Conference on Field and Service Robotics (FSR)*, 1999.

[194] F. Dellaert, W. Burgard, D. Fox, and S. Thrun. Using the condensation algorithm for robust, vision-based mobile robot localization. In *Proc. of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR)*, 1999.

[195] W. Burgard, D. Fox, H. Jans, C. Matenar, and S. Thrun. Sonar-based mapping of large-scale mobile robot environments using EM. In *Proc. of the International Conference on Machine Learning (ICML)*, 1999.

[196] S. Thrun, M. Bennewitz, W. Burgard, A.B. Cremers, F. Dellaert, D. Fox, D. Hähnel, C. Rosenberg, N. Roy, J. Schulte, and D. Schulz. MINERVA: A second generation mobile tour-guide robot. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 1999.

[197] F. Dellaert, D. Fox, W. Burgard, and S. Thrun. Monte Carlo Localization for mobile robots. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 1999.

[198] N. Roy, W. Burgard, D. Fox, and S. Thrun. Coastal navigation: Mobile robot navigation with uncertainty in dynamic environments. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 1999.

[199] D. Schulz, W. Burgard, and A.B. Cremers. Robust visualization of navigation experiments with mobile robots over the internet. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 1999.

[200] F. Schönherr, J. Hertzberg, and W. Burgard. Probabilistic mapping of unexpected objects by a mobile robot. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 1998.

[201] D. Fox, W. Burgard, S. Thrun, and A.B. Cremers. Position estimation for mobile robots in dynamic environments. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 1998.

[202] S. Thrun, J.-S. Gutmann, D. Fox, W. Burgard, and B. Kuipers. Integrating topological and metric maps for mobile robot navigation: A statistical approach. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 1998.

[203] W. Burgard, A.B. Cremers, D. Fox, D. Hähnel, G. Lakemeyer, D. Schulz, W. Steiner, and S. Thrun. The interactive museum tour-guide robot. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 1998.

[204] D. Hähnel, W. Burgard, and G. Lakemeyer. GOLEX — bridging the gap between logic (GOLOG) and a real robot. In *Proc. of the 22nd German Conference on Artificial Intelligence (KI'98)*, LNCS. Springer Verlag, 1998.

[205] J.-S. Gutmann, W. Burgard, D. Fox, and K. Konolige. An experimental comparison of localization methods. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 1998.

[206] W. Burgard, A. Derr, D. Fox, and A.B. Cremers. Integrating global position estimation and position tracking for mobile robots: the Dynamic Markov Localization approach. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 1998.

[207] D. Fox, W. Burgard, S. Thrun, and A.B. Cremers. A hybrid collision avoidance method for mobile robots. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 1998.

[208] S. Thrun, D. Fox, and W. Burgard. Probabilistic mapping of an environment by a mobile robot. In *Proc. of the IEEE International Conference on Robotics & Automation (ICRA)*, 1998.

[209] W. Burgard, D. Fox, and S. Thrun. Active mobile robot localization. In *Proc. of the International Joint Conference on Artificial Intelligence (IJCAI)*, 1997.

[210] W. Burgard, D. Fox, and D. Hennig. Fast grid-based position tracking for mobile robots. In *Proc. of the German Conference on Artificial Intelligence (KI), Germany*. Springer Verlag, 1997.

[211] W. Burgard, D. Fox, D. Hennig, and T. Schmidt. Estimating the absolute position of a mobile robot using position probability grids. In *Proc. of the National Conference on Artificial Intelligence (AAAI)*, 1996.

[212] D. Fox, W. Burgard, and S. Thrun. Controlling synchro-drive robots with the dynamic window approach to collision avoidance. In *Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 1996.

[213] W. Burgard, A.B. Cremers, D. Fox, M. Heidelbach, A.M. Kappel, and S. Lüttringhaus Kappel. Knowledge-enhanced CO-monitoring in coal mines. In *Proc. of the Ninth International Conference on Industrial & Engineering Applications of Artificial Intelligence & Expert Systems*, 1996.

[214] W. Burgard, A. Cremers, T. Kolbe, and L. Plümer. Object construction by deduction for a 3d geo-information system of a mine. In *Proceedings of the 4th Int. Conf. on Practical Application of Prolog (PAP)*, 1996.

REFEREED SYMPOSIUM/WORKSHOP ARTICLES

[1] C. Sprunk, J. Roewekaemper, G. Parent, L. Spinello, G.D. Tipaldi, W. Burgard, and M. Jalobeanu. An experimental protocol for benchmarking robotic indoor navigation. In *Proc. of the International Symposium on Experimental Robotics (ISER)*, June 2014.

[2] M. Beinhofer and W. Burgard. Efficient estimation of expected distributions for mobile robot navigation. In *Proc. of the Austrian Robotics Workshop (ARW)*, May 2014.

[3] Dominik Joho, Martin Senk, and Wolfram Burgard. Learning wayfinding heuristics based on local information of object maps. In *Proc. of the European Conference on Mobile Robots (ECMR)*, pages 117–122, 2009.

[4] H. Schulz, L. Ott, J. Sturm, and W. Burgard. Learning kinematics from direct self-observation using nearest-neighbor methods. In *Proc. of the German Workshop on Robotics*, 2009.

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

[6] 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 (ICRA)*, 2008.

[7] S. Grzonka, S. Bouabdallah, G. Grisetti, W. Burgard, and R. Siegwart. Towards a fully autonomous indoor helicopter. In *Workshop of IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2008.

[8] Slawomir Grzonka, Giorgio Grisetti, and Wolfram Burgard. Autonomous indoors navigation using a small-siye quadrotor. In *Workshop Proc. of Int. Conf. on Simulation, Modeling and Programming for Autonomous Robots (SIMPAR)*, 2008.

[9] J. Müller, C. Stachniss, K. Arras, and W. Burgard. Socially inspired motion planning for mobile robots in populated environments. In *International Conference on Cognitive Systems (CogSys)*, 2008.

[10] P. Pfaff, R. Kümmerle, D. Joho, C. Stachniss, R. Triebel, and W. Burgard. Navigation in combined outdoor and indoor environments using multi-level surface maps. In *Proc. of the Workshop on Safe Navigation in Open and Dynamic Environments at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2007.

[11] R. Kümmerle, P. Pfaff, R. Triebel, and W. Burgard. Active Monte Carlo localization in outdoor terrains using multi-level surface maps. In *Fachgespräche Autonome Mobile Systeme (AMS)*, 2007.

[12] D. Meyer-Delius and W. Burgard. Maximum-likelihood sample-based maps for mobile robots. In *Proc. of the European Conference on Mobile Robots (ECMR)*, 2007.

[13] A. Rottmann, M. Sippel, T. Zitterell, W. Burgard, L. Reindl, and C. Scholl. Towards an experimental autonomous blimp platform. In *Proc. of the European Conference on Mobile Robots (ECMR)*, 2007.

[14] 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 European Conference on Mobile Robots (ECMR)*, 2007.

[15] D. Meyer-Delius, C. Plagemann, G. von Wichert, W. Feiten, G. Lawitzky, and W. Burgard. A probabilistic relational model for characterizing situations in dynamic multi-agent systems. In *Proc. of the 31st Annual Conference of the German Classification Society on Data Analysis, Machine Learning, and Applications (GfKl)*, Freiburg, Germany, 2007.

[16] R. Triebel, O. Martínez Mozos, and W. Burgard. Relational learning in mobile robotics: An application to semantic labeling of objects in 2d and 3d environment maps. In *Annual Conference of the German Classification Society on Data Analysis, Machine Learning, and Applications (GfKl)*, Freiburg, Germany, 2007.

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

[18] D. Joho, C. Stachniss, P. Pfaff, and W. Burgard. Autonomous exploration for 3d map learning. In *Proc. Fachgespräche Autonome Mobile Systeme*, Kaiserslautern, Germany, 2007.

[19] O. Martínez Mozos, C. Stachniss, A. Rottmann, and W. Burgard. Using AdaBoost for place labeling and topological map building. In *Proc. of the Int. Symposium of Robotics Research (ISRR)*, 2005.

[20] C. Plagemann, T. Müller, and W. Burgard. Vision-based 3d object localization using probabilistic models of appearance. In *Proceedings of the 27th Pattern Recognition Symposium (DAGM)*, Lecture Notes in Computer Science. Springer, 2005.

[21] C. Plagemann and W. Burgard. Sequential parameter estimation for fault diagnosis in mobile robots using particle filters. In *Proceedings of Autonome Mobile Systeme 2005 (AMS)*. Springer, 2005.

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

[23] D. Sack and W. Burgard. A comparison of methods for line extraction from range data. In *Proc. of the IVAC Symposium on Intelligent Autonomous Vehicles (IAV)*, 2004.

[24] R. Triebel, B. Frank, J. Meyer, and W. Burgard. First steps towards a robotic system for flexible volumetric mapping of indoor environments. In *Proc. of the IVAC Symposium on Intelligent Autonomous Vehicles (IAV)*, 2004.

[25] D. Hähnel, S. Thrun, B. Wegbreit, and W. Burgard. Towards lazy data association in SLAM. In *Proc. of the Int. Symposium of Robotics Research (ISRR)*, 2003.

[26] C. Stachniss and W. Burgard. Using coverage maps to represent the environment of mobile robots. In *Proc. of the European Conference on Mobile Robots (ECMR)*, 2003.

[27] G. Cielniak, M. Bennewitz, and W. Burgard. Robust localization of persons based on learned motion patterns. In *Proc. of the European Conference on Mobile Robots (ECMR)*, 2003.

[28] W. Burgard, P. Trahanias, D. Hähnel, M. Moors, D. Schulz, H. Baltzakis, and Argyros A. Tourbot and webfair: Web-operated mobile robots for tele-presence in populated exhibitions. In *Proc. of the IROS 02 Workshop on Robots in Exhibition*, 2002.

[29] D. Schulz, M. Moors, W. Burgard, and A.B. Cremers. A statistical approach to tracking multiple moving people with a mobile robot and its application to improved tele-presence. In *Proc. of the VDI-Conference Robotik 2002 (Robotik)*, 2002.

[30] M. Bennewitz, W. Burgard, and S. Thrun. Learning motion patterns of persons for mobile service robots. In *Proc. of the VDI-Conference Robotik 2002 (Robotik)*, 2002.

[31] D. Hähnel and W. Burgard. Probabilistic matching for 3d scan registration. In *Proc. of the VDI-Conference Robotik 2002 (Robotik)*, 2002.

[32] D. Hähnel, W. Burgard, and S. Thrun. Learning compact 3d models of indoor and outdoor environments with a mobile robot. In *Proc. of the fourth European workshop on advanced mobile robots (EUROBOT)*, 2001.

[33] M. Bennewitz and W. Burgard. Finding solvable priority schemes for decoupled path planning techniques for teams of mobile robots. In *Proc. of the International Symposium on Intelligent Robotic Systems (SIRS)*, 2001.

[34] M. Bennewitz and W. Burgard. An experimental comparison of path planning techniques for teams of mobile robots. In *Tagungsband des 16. Fachgesprächs Autonome Mobile Systeme (AMS)*, 2000.

[35] M. Bennewitz and W. Burgard. Coordinating the motions of multiple mobile robots using a probabilistic model. In *Proc. of the International Symposium on Intelligent Robotic Systems (SIRS)*, 2000.

[36] M. Bennewitz and W. Burgard. A probabilistic method for planning collision-free trajectories of multiple mobile robots. In *Proc. of the Workshop Service Robotics - Applications and Safety Issues in an Emerging Market at the 14th European Conference on Artificial Intelligence (ECAI)*, 2000.

[37] N. Roy, W. Burgard, D. Fox, and S. Thrun. Coastal navigation: Robot motion with uncertainty. In *Proc. of the 1998 AAAI Fall Symposium*, 1998.

[38] W. Burgard, A.B. Cremers, D. Fox, D. Hähnel, G. Lakemeyer, D. Schulz, W. Steiner, and S. Thrun. The museum tour-guide robot RHINO. In *Proc. of Fachgespräch Autonome Mobile Systeme (AMS'98)*, Karlsruhe, Germany, 1998.

[39] D. Fox, W. Burgard, and S. Thrun. Markov localization for reliable robot navigation and people detection. In *Modelling and Planning for Sensor-Based Intelligent Robot Systems*, LNCS. Springer Verlag, 1999.

[40] W. Burgard, D. Fox, D. Hähnel, G. Lakemeyer, D. Schulz, W. Steiner, S. Thrun, and A.B. Cremers. Real robots for the real world — the *RHINO* museum tour-guide project. In *Proc. of the AAAI 1998 Spring Symposium on Integrating Robotics Research: Taking the Next Leap*, 1998.

[41] M. Beetz, W. Burgard, A.B. Cremers, and D. Fox. Active localization for service robot applications. In *Proc. of the 5th Symposium for Intelligent Robotics Systems (SIRS'97), Stockholm, Sweden*, 1997.

[42] W. Burgard, D. Fox, and S. Thrun. Active mobile robot localization by entropy minimization. In *Proc. of the Second Euromicro Workshop on Advanced Mobile Robots*. IEEE Computer Society Press, 1997.

[43] W. Burgard, D. Fox, D. Hennig, and T. Schmidt. Position tracking with position probability grids. In *Proc. of the First Euromicro Workshop on Advanced Mobile Robots*. IEEE Computer Society Press, 1996.

[44] W. Burgard, A.B. Cremers, D. Fox, M. Heidelbach, A.M. Kappel, and S. Lüttringhaus-Kappel. Logic programming tools applied to fire detection in hard-coal mines. In *Proc. of the Joint International Conference and Symposium on Logic Programming*, 1996.

[45] W. Burgard. Efficiency considerations on goal-directed forward chaining for logic programs. In *Proceedings of the 4th workshop on Computer Science Logic (CSL)*, 1990.

UNREFEREED/INVITED ARTICLES

[1] C. Stachniss, G. Grisetti, 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)*, 2004.

[2] D. Fox, W. Burgard, and S. Thrun. Probabilistic methods for mobile robot mapping. In *Proc. of the IJCAI-99 Workshop on Adaptive Spatial Representations of Dynamic Environments*, Stockholm, Sweden, 1999.

[3] S. Thrun, M. Bennewitz, W. Burgard, A.B. Cremers, F. Dellaert, D. Fox, D. Hähnel, C. Rosenberg, N. Roy, J. Schulte, and D. Schulz. MINERVA: A tour-guide robot that learns. In *Proc. of the German Conference on Artificial Intelligence (KI), Germany*. Springer Verlag, 1999.

[4] S. Thrun, D. Fox, and W. Burgard. Probabilistic state estimation in robotics. In *Proc. of the Workshop on Self-Organization of Adaptive Behavior, Ilmenau, Germany*. VDI-Verlag, 1997.

[5] J. Buhmann, W. Burgard, A.B. Cremers, D. Fox, T. Hofmann, F. Schneider, J. Strikos, and S. Thrun. The mobile robot Rhino. *AI Magazine*, 16(2):31–38, Summer 1995.

THESES

[1] W. Burgard. *Goal-directed Forward Chaining for Logic Programs*. PhD thesis, University of Bonn, Department of Computer Science, 1991.

[2] W. Burgard. PROSPERT: An expert system for the syntesis of chemical processes. Master's thesis, University of Dortmund, Department of Computer Science, 1987. In German.

Professional Activities

CHAIRMANSHIPS / EDITORIAL BOARDS

- Editor in Chief, IEEE/RSJ International Conference on Intelligent Robots and Systems, 2014-2017.
- Associate Editor of the Journal of Artificial Intelligence Research (JAIR), 2012-2017.
- Program co-chair of the AAAI Conference on Artificial Intelligence (AAA), 2011.
- Program chair of Intelligent Autonomous Systems (IAS), 2008.
- General chair of Robotics - Science and Systems (RSS), 2007.
- General chair of the *European Conference on Mobile Robots (ECMR)*, 2007.
- Program chair of Robotics - Science and Systems (RSS), 2006.
- Associate editor of the *IEEE Transactions on Robotics*, 2005-2008.
- Editorial board of the *Journal of Artificial Intelligence Research (JAIR)*, 2003-2006.
- Co-chair of the *IEEE Technical Committee on Networked Robots*, 2003-2007.
- Program co-chair of the *European Conference on Mobile Robots (ECMR)*, 2005.

- Organizer of the *ICRA-2004 Workshop on Networked and Wireless Robots*, 2004.
- Chair of the *European Conference on Mobile Robots (ECMR)*, 2003.
- Organizer of the *IROS-2002 Workshop on Robots in Exhibitions*, 2002.
- Co-chair of the *Third Workshop on Reasoning under Uncertainty in Robotics (RUR)*, 2001.
- Program Co-chair of the *Fourth European Workshop on Advanced Mobile Robots (EUROBOT)*, 2001.
- Guest Editor of *KI* (Special Issue on Mobile Robots).
- Guest editor of *Robotics and Autonomous Systems* (Special Issue on the Third European Workshop on Advanced Mobile Robots).
- Program chair of the *Third European Workshop on Advanced Mobile Robots (EUROBOT)*, 1999.
- Co-chair of the *23rd German Conference of Artificial Intelligence (KI)*, 1999.
- Co-chair of the *Workshop on Adaptive Spatial Representations of Dynamic Environments*, International Joint Conference on Artificial Intelligence (IJCAI), 1999.
- Workshop chair of the *22nd German Conference of Artificial Intelligence (KI)*, 1998.

BOARDS

- Member of the Board of Directors of the *Open Source Robotics Foundation*.
- Conference Board of the International Conference *Robotics 2005, Science and Systems*.
- EURON coordination committee for the key-area dissemination.
- Scientific Advisory Board of *AndroTeC GmbH, Intelligente Automatisierungs- und Robotertechnik*.
- Scientific Advisory Board of *EPainters GmbH*.

MEMBERSHIPS

- Member GI
- Senior Member IEEE
- Life-time member AAAI

TUTORIALS

- Tutorial on probabilistic techniques for robot navigation, Fall School on Human Robot Interaction, Dresden, 2013.
- Tutorial on probabilistic techniques for robot navigation, GI-Conference, Koblenz, 2013.
- Tutorial on probabilistic techniques for robot navigation, Bosch Expert Days, Stuttgart, 2013.
- Tutorial on three-dimensional mapping with mobile robots, SLAM Summer School, Sydney, 2009.
- Tutorial on solving the SLAM problem with Rao-Blackwellized Particle Filters, SLAM Summer School, Oxford, 2006.
- Tutorial on Rao-Blackwellized Particle Filters for Simultaneous Mapping and Localization and Tutorial in Mapping in Dynamic Environments, SLAM Summer School, Toulouse, 2004.

- Tutorial on Probabilistic Robotics, International Spacial Cognition Summer Institute (ISCSI), 2003.
- Tutorial on Probabilistic Robotics, Interdisziplinäres Kolleg (IK), 2003.
- Tutorial on Mapping in Dynamic Environments, SLAM Summer School, Stockholm, 2002.
- Probabilistic Techniques for Mobile Robots at the European Summer School for Mobile Robot Navigation, EPFL, Lausanne, 2001.
- ECAI-Tutorial on Probabilistic Techniques for Mobile Robots, 2002.
- ICRA-Tutorial on Probabilistic Techniques for Mobile Robots, 2001.
- Tutorial on Probabilistic Techniques for Mobile Robots at the European Summer School for Mobile Robot Navigation, EPFL, Lausanne, 2001.

PROGRAM COMMITTEES

- International Conference on Robotics and Automation (ICRA), Best Paper Award Committee, 2011.
- AAAI Conference on Artificial Intelligence, Area Chair, 2010.
- International Conference on Robotics - Science and Systems (RSS), Area Chair, 2005.
- International Conference on Robotics and Automation (ICRA), 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013.
- International Conference on Intelligent Robots and Systems (IROS), 2001, 2002, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013.
- IVAC Symposium on Intelligent Autonomous Vehicles (IAV), 2004.
- Seventh International Symposium Distributed Autonomous Robotic Systems (DARS), 2004.
- International Joint Conference on Artificial Intelligence ((IJCAI), Senior-PC-Member, 2003, 2009.
- Second International Joint Conference on Autonomous Agents and Multi-Agent Systems (AA-MAS), 2003.
- European Conference on Machine Learning (ECML), 2001, 2002.
- European Workshop on Advanced Mobile Robots (EUROBOT), 1999, 2001.
- Symposium for Intelligent Robotics Systems (SIRS), 2000, 2001.
- National Conference on Artificial Intelligence (AAAI), 1998, 1999, 2000, 2002, 2008.
- German Conference on Artificial Intelligence (KI), 1999, 2009.

PHD COMMITTEES

- Oxford University
- University of Oerebroe
- Carnegie Mellon University
- University La Sapienza, Rome
- University of Porto
- University of Zaragoza
- KTH Sweden, Stockholm

- Katholieke Universiteit Leuven
- University of Bonn
- EPFL Lausanne
- University of Munich
- University of Bremen
- Australian National University
- Australian Centre for Field Robotics / University of Sydney
- University of Pisa
- Karlsruhe Institute of Technology