Curriculum Vitae

Wolfram Burgard

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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).

Industry Positions

- Vice President Automated Driving Technology/Machine Learning — Jan 2019 - Mar 2021
  Toyota Research Institute, Los Altos, CA, USA.

Academic Positions

- Full professor — 2022 - today
  University of Technology Nuremberg.
- Full professor — 2006 - 2022
  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

- Department Chair, Department of Engineering Feb. 2022 - today
  University of Technology Nuremberg
- Senior Past President of the IEEE Robotics and Automation Society Jan. 2022 - Dec. 2023
  Piscataway, NJ, United States
- Spokesperson of the Center BrainLinks-BrainTools Jan. 2020 - Jan. 2022
  University of Freiburg.
- Junior Past President of the IEEE Robotics and Automation Society Jan. 2020 - Dec. 2021
  Piscataway, NJ, United States
- Spokesperson of the Cluster of Excellence BrainLinks-BrainTools Oct. 2012 - Dec. 2019
  University of Freiburg.
- President of the IEEE Robotics and Automation Society Mar. 2018 - Dec. 2019
  Piscataway, NJ, United States
- Spokesperson of the Graduate School Embedded Microsystems Oct. 2010 - 2015
  University of Freiburg.
- Vice Dean of the Faculty of Engineering 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

- **IEEE RAS Technical Field Award**. IEEE, 2022.
- **Distinguished Professorship**. Free State of Bavaria, 2022.
- **IEEE Robotics and Automation Magazine Best Paper Award**. *Building an Aerial-Ground Robotics System for Precision Farming: An Adaptable Solution*, 2022.
- **ICRA 2020 Milestone Award**. IEEE International Conference on Robotics and Automation (ICRA), *Monte Carlo Localization for Mobile Robots*, 2020.
- **IROS 2019 Best Paper Award**. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *Planning Reactive Manipulation in Dynamic Environments*, 2019.
- **IV 2018 Best Paper Award**. IEEE Intelligent Vehicles Symposium (IV), *Courtesy Behavior for Highly Automated Vehicles on Highway Interchanges*, 2018.
- **ICRA 2018 Best Robot Vision Paper Award**. IEEE International Conference on Robotics and Automation (ICRA), *Optimization Beyond the Convolution: Generalizing Spatial Relations with End-to-End Metric Learning*, 2018.
- **IROS Harashima Award for Innovative Technologies**. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), *For pioneering research in robotic simultaneous localization and mapping*, 2018.
- **AAAI 1999 Classic Paper Award**, 2017.
- **AAAI 1998 Classic Paper Award**, 2016.
- **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 Association for Artificial Intelligence (**EurAI**), 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

- **IMBIT**: Institute for Machine Brain Interfacing Technology, German Science Council, 2021.
- **OML**: Organic Machine Learning, BMBF, 2019-2022.
- **NaRKo**: Compliant Service Robots for Logistics in Hospitals, BMBF 2016-2019.
- **Flourish**: Aerial Data Collection and Analysis, and Automated Ground Intervention for Precision Farming, EU-Horizon 2020, 2016-2019.
- **RobDream**: Optimizing Robot Performance while Dreaming, EU-Horizon 2020, 2015-2018.
- **Squirrel**: Clearing clutter bit by bit, EU-IST IP, 2013-2018.
- **EUROPA2**: European Pedestrian Robot 2. EU-IST STREP, 2013-2018 (Coordinator).
- **BrainLinks-BrainTools**: Cluster of Excellence, German Research Foundation, German Research Foundation, 2012-2019.
- **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 Kretzschmar, 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

28. Annett Stelzer, 2016
29. Nichola Abdo, 2017
30. Benjamin Suger, 2017
31. Jörg Röwekämper, 2017
32. Tayyab Naseer, 2017
33. Felix Burget, 2018
34. Abhinav Valada, 2019
35. Noha Radwan, 2019
36. Philipp Ruchti, 2019
37. Gabriel Leivas Oliveira, 2019
38. Michael Herman, 2020
39. Alexander Schaefer, 2020
40. Joos Behncke, 2020
41. Tim Welschehold, 2020
42. Ayush Dewan, 2020
43. Federico Boniardi, 2020
44. Lukas Luft, 2020
45. Chau Do, 2020
46. Andreas Kuhner, 2020
47. Philipp Sebastian Schmitt, 2020
48. Jingwei Zhang, 2021
49. Marina Kollmitz, 2021
50. Florian Wirnshofer, 2021
51. Cristina Menéndez, 2021
52. Tim Caselitz, 2021
53. David Pannen, 2021
54. Lukas Enderich, 2022
55. Michael Krawez, 2022

Patents

- Object recognition method, object recognition apparatus and autonomous mobile robot
- Method for locating a mobile robot
- Method and system for calibrating a network of multiple horizontally scanning range finders
- Method and system for building a lighting adaptable map of an indoor scene and using it for estimating an unknown light setting

Publication List

BOOKS / PROCEEDINGS

[1] A. Bicchi and W. Burgard, editors. *Robotics Research*. Springer, 2017. Proc. of the International Symposium on Robotics Research (ISRR), 2015.

[2] 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.

[3] 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.

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

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

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

[7] 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.

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

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

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

BOOK CHAPTERS / COLLECTIONS

[1] W. Burgard, M. Hebert, and M. Bennewitz. World modeling. In B. Siciliano and O. Khatib, editors, *Springer Handbook of Robotics*, chapter 36, pages 1135–1152. Springer Verlag, 2016.

[2] K. 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.

[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. 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 T. 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. 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 C. Beierle and L. Plümer, editors, *Logic Programming: Formal Methods and Practical Applications*. Elsevier Science B.V., 1995.

Refereed Journal/Magazine Articles

[1] S. Yan, T. Welschehold, D. Büscher, and W. Burgard. Courteous behavior of automated vehicles at unsignalized intersections via reinforcement learning. *IEEE Robotics and Automation Letters (RA-L)*, 7(1):191–198, 2022.

[2] M. Krawez, T. Caselitz, J. Sundram, M. Van Loock, and W. Burgard. Real-time outdoor illumination estimation for camera tracking in indoor environments. *IEEE Robotics and Automation Letters (RA-L)*, 2021.

[3] W. Winterhalter, F. Fleckenstein, C. Dornhege, and W. Burgard. Localization for precision navigation in agricultural fields - beyond crop row following. *Journal of Field Robotics*, 38(3):429–451, 2021.

[4] L. Enderich, F. Timm, and W. Burgard. SYMOG: Learning symmetric mixture of gaussian modes for improved fixed-point quantization. *Neurocomputing Journal*, 4/6:310–315, 2020.

[5] A. Pretto, S. Aravecchia, W. Burgard, N. Chebrolu, C. Dornhege, T. Falck, F. Fleckenstein, A. Fontenla, M. Imperoli, R. Khanna, F. Liebisch, P. Lottes, A. Milioto, D. Nardi, S. Nardi, J. Pfeifer, M. Popović, C. Potena, C. Pradalier, E. Rothacker-Feder, I. Sa, A. Schaefer, R. Siegwart, C. Stachniss, A. Walter, W. Winterhalter, X. Wu, and J. Nieto. Building an aerial-ground robotics system for precision farming: An adaptable solution. *IEEE Robotics & Automation Magazine*, 2020.

[6] L. Luft, F. Boniardi, A. Schaefer, D. Büscher, and W. Burgard. On the Bayes filter for shared autonomy. *IEEE Robotics and Automation Letters (RA-L)*, 4(4):3286–3293, 2019.

[7] A. Valada, R. Mohan, and W. Burgard. Self-supervised model adaptation for multimodal semantic segmentation. *International Journal of Computer Vision*, pages 1573–1405, 2019. Special Issue: Deep Learning for Robotic Vision.

[8] J. Zhang, L. Tai, Y. Peng, Y. Xiong, M. Liu, J. Boedecker, and W. Burgard. VR-goggles for robots: Real-to-sim domain adaptation for visual control. *IEEE Robotics and Automation Letters (RA-L)*, 4(2):1148–1155, 2019.

[9] M. Kollmitz, A. Eitel, A. Vasquez, and W. Burgard. Deep 3D perception of people and their mobility aids. *Robotics and Autonomous Systems*, 114:29–40, 2019.

[10] F. Boniardi, T. Caselitz, R. Kümmerle, and W. Burgard. A pose graph-based localization system for long-term navigation in CAD floor plans. *Robotics and Autonomous Systems*, 112:84 – 97, 2019.

[11] L. Luft, A. Schaefer, T. Schubert, and W. Burgard. Detecting changes in the environment based on full posterior distributions over real-valued grid maps. *IEEE Robotics and Automation Letters (RA-L)*, 3(2):1299–1305, 2018.

[12] N. Radwan, A. Valada, and W. Burgard. VLocNet++: Deep multitask learning for semantic visual localization and odometry. *IEEE Robotics and Automation Letters (RA-L)*, 2018.

[13] A. Schaefer, L. Luft, and W. Burgard. Dct maps: Compact differentiable lidar maps based on the cosine transform. *IEEE Robotics and Automation Letters (RA-L)*, 3(2):1002–1009, 2018.

[14] W. Winterhalter, F. Fleckenstein, C. Dornhege, and W. Burgard. Crop row detection on tiny plants with the pattern hough transform. *IEEE Robotics and Automation Letters (RA-L)*, 3(4):3394–3401, 2018.

[15] R. T. Schirrmeister, J. T. Springenberg, L. D. J. Fiederer, M. Glasstetter, K. Eggensperger, M. Tangermann, F. Hutter, W. Burgard, and T. Ball. Deep learning with convolutional neural networks for EEG decoding and visualization. *Human Brain Mapping*, 38(11):5391–5420, 2017.

[16] A. Kuhner, T. Schubert, M. Cenciarini, I. K. Wiesmeier, V. A. Coenen, W. Burgard, C. Weiller, and C. Maurer. Correlations between motor symptoms across different motor tasks, quantified via random forest feature classification in parkinson's disease. *Frontiers in Neurology*, 8:607, 2017.

[17] A. Valada and W. Burgard. Deep spatiotemporal models for robust proprioceptive terrain classification. *International Journal of Robotics Research (IJRR)*, 36(13–14):1521–1539, 2017.

[18] D. Speck, C. Dornhege, and W. Burgard. Shakey 2016 - how much does it take to redo shakey the robot? *IEEE Robotics and Automation Letters*, 2(2):1203–1209, 2017.

[19] P. Ruther, S. Goering, A. Stett, T. Ball, W. Burgard, E. Chudler, and R. Rao. New perspectives on neuroengineering and neurotechnologies: NSF-DFG workshop report. *IEEE Transactions on Biomedical Engineering*, 63(7):1354–1367, 2016.

[20] N. Abdo, C. Stachniss, L. Spinello, and W. Burgard. Organizing objects by predicting user preferences through collaborative filtering. *International Journal of Robotics Research (IJRR)*, 35(13):1587–1608, 2016.

[21] P. Schopp, H. Graf, W. Burgard, and Y. Manoli. Self-calibration of accelerometer arrays. *IEEE Transactions on Instrumentation and Measurement*, 65(8):1913–1925, 2016.

[22] S. Oßwald, M. Bennewitz, W. Burgard, and C. Stachniss. Speeding-up robot exploration by exploiting background information. *IEEE Robotics and Automation Letters*, 1(2):716–723, 2016.

[23] C. Schwering, T. Niemueller, G. Lakemeyer, N. Abdo, and W. Burgard. Sensor fusion in the epistemic situation calculus. *Journal of Experimental & Theoretical Artificial Intelligence*, 28(5):871–887, 2016.

[24] C. Sprunk, B. Lau, P. Pfaff, and W. Burgard. An accurate and efficient navigation system for omnidirectional robots in industrial environments. *Autonomous Robots*, 41(2):473–493, 2016.

[25] H. Kretzschmar, M. Spies, C. Sprunk, and W. Burgard. Socially compliant mobile robot navigation via inverse reinforcement learning. *International Journal of Robotics Research (IJRR)*, 35(11):1289–1307, 2016.

[26] 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.

[27] R. Kümmerle, M. Ruhnke, B. Steder, C. Stachniss, and W. Burgard. Autonomous robot navigation in highly populated pedestrian zones. *Journal of Field Robotics*, 32(4):565–589, 2014.

[28] 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*, 2014.

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

[30] K. 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.

[31] 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.

[32] 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.

[33] 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.

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

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THESES

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[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 of the *IEEE Transactions on Robotics*, 2020-2022.

- Program Chair of the IEEE International Conference on Robotics and Automation (ICRA), 2020.
- Local Arrangements Chair of Robotics - Science and Systems, 2019.
- Associate Editior of the IEEE International Conference on Robotics and Automation (ICRA), 2018.
- 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

- Founding Member *Open Source Robotics Foundation, 2012*.
- 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
- Member of the AdCom-Committe of the IEEE Robotics and Automation Society (2012-2018)

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, 2020.
- International Conference on Intelligent Robots and Systems (IROS), 2001, 2002, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016.
- 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 (AAMAS), 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