

Lebenslauf

Wolfram Burgard

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Arbeitsadresse:

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Kurzbeschreibung

Wolfram Burgard ist Professor für Informatik am Institut für Informatik der Universität Freiburg. Er studierte Informatik an der Universität Dortmund und erhielt sein Diplom im Jahr 1987. Danach wurde er wissenschaftlicher Mitarbeiter am Institut für Informatik der Universität Dortmund. Er folgte dann 1990 seinem späteren Doktorvater Armin B. Cremers an die Universität Bonn, wo er 1991 in Informatik promovierte. Anschließend war er an der Universität Bonn als wissenschaftlicher Assistent und Akademischer Rat tätig. Im Jahr 1999 nahm er dann einen Ruf an das Institut für Informatik der Universität Freiburg auf die Professur für Autonome Intelligente Systeme an. Seine Interessen liegen im Überlappungsbereich der Robotik und der Künstliche Intelligenz. Zusammen mit seiner Arbeitsgruppe entwickelte Wolfram Burgard zahlreiche innovative, probabilistische Ansätze für mobile Roboter. Diese decken unterschiedliche Probleme der Robotik ab, wie beispielsweise die Positionsschätzung, die Pfadplanung, die Exploration und auch die Erstellung von Karten. Die von ihm entwickelten Verfahren spielen heute eine fundamentale Rolle in der Entwicklung autonomer Fahrzeuge. Für diese Beiträge erhielt Wolfram Burgard eine Vielzahl von Ehrungen und Preise, darunter zehn Best Paper Awards und zwei Classic Paper Awards. Die Classic Paper Awards wurden ihm von der American Association of Artificial Intelligence verliehen, was bisher vor ihm noch keinem in Deutschland forschenden Wissenschaftler gelungen ist. Er ist Ehrenmitglied der American Association for Artificial Intelligence, des European Coordination Committee for Artificial Intelligence und des Institute of Electrical and Electronics Engineers. Im Jahr 2009 erhielt er den Gottfried Wilhelm Leibniz Preis und im Jahr 2010 einen Advanced Grant des Europäischen Forschungsrats. Im Jahr 2018 erhielt er den Harashima Preis für Innovative Technologien. Der Preis wurde an ihn wegen seiner bahnbrechenden Forschung zum Problem der simultanen Lokalisierung und Kartierung in der Robotik vergeben. Wolfram Burgard war Sprecher des Exzellenzclusters BrainLinks-BrainTools und Präsident der IEEE Robotics and Automation Society. Von 2019 bis 2021 war Wolfram Burgard ebenfalls Vice President for Automated Driving und Machine Learning beim Toyota Research Institute in Los Altos, California, USA.

Forschungsinteressen

- Robotik und autonomes Fahren
- Künstliche Intelligenz

- Autonome intelligente/mobile Systeme (probabilistische Algorithmen, Navigation, Service-Robotik, eingebettete Systeme, Mustererkennung und maschinelles Lernen für Roboter)
- Zustandsschätzung (statistische Algorithmen, probabilistische Modelle)

Ausbildung

- Promotion (Dr. rer.-nat.), Universität Bonn, Informatik. Dezember 1991
- Diplom, Universität Dortmund, Informatik mit Nebenfach Mathematik. April 1987
- Vordiplom, Universität Dortmund Informatik mit Nebenfach Mathematik. März 1984

Industriepositionen

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

Akademische Positionen

- Professor (W3) Universität Freiburg, Institut für Informatik. 2006 - heute
- C3-Professor Universität Freiburg, Institut für Informatik. 1999 - 2006
- Gastwissenschaftler Carnegie Mellon University, School of Computer Science. 03-10/2002
- Wissenschaftlicher Angestellter (C1) und Akademischer Rat Universität Bonn, Institut für Informatik. 1991 - 1999
- Wissenschaftlicher Angestellter (BATT IIa) Universität Bonn, Institut für Informatik. 1990-1991
- Wissenschaftlicher Angestellter (BATT IIa) Universität Dortmund, Institut für Informatik. 1987-1990

Adjungierte Positionen

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

Aktivitäten in der Selbstverwaltung

- Senior Past President der IEEE Robotics and Automation Society Piscataway, NJ, United States Jan. 2022 - Dez. 2023
- Sprecher des Zentrums BrainLinks-BrainTools Universität Freiburg. Jan. 2020 - heute
- Junior Past President der IEEE Robotics and Automation Society Piscataway, NJ, United States Jan. 2020 - Dez.2021

- Sprecher des Exzellenz-Clusters BrainLinks-BrainTools
Universität Freiburg. Oct. 2012 - Dez. 2019
- President der IEEE Robotics and Automation Society
Piscataway, NJ, United States Mar. 2018 - Dec. 2019
- Sprecher des Graduiertenkollegs Eingebettete Mikrosysteme
Universität Freiburg. Oct. 2010 - 2015
- Prodekan
Universität Freiburg, Technische Fakultät. Okt. 2010 - Sept. 2012
- Direktor des Instituts für Informatik
Universität Freiburg. Sept. 2006 - Sept. 2010
- Studiendekan
Universität Freiburg, Institut für Informatik. Oct. 2000 - Dec. 2004
- Stellvertretender Direktor des Instituts für Informatik
Universität Freiburg. Oct. 2002 - Apr. 2003
- EU-Beauftragter des Rektors.
Universität Freiburg, Institut für Informatik. Oct. 2000 - 2004
- Vertreter der wissenschaftlichen Mitarbeiter,
Universität Bonn, Institut für Informatik. 1998-1999

Projekte

- **OpenDR**: Open Deep Learning Toolkit for Robotics, EU-H2020, 2019-2022
- **OML**: Organic Machine Learning, BMBF, 2019-2022.
- **KaLiMU**: Hochintegrierte Kamera-Lidar-Sensorik für mobile Robotikanwendungen, BMBF, 2019-2022
- **RobDream**: Continuously learning mobile manipulation robots, EU-H2020, 2015-2018.
- **Flourish**: Innovative robotic methods of sustainable farming, EU-H2020, 2015-2018.
- **Squirrel**: Clearing clutter bit by bit, EU-IST IP, 2013-2017.
- **EUROPA2**: European Pedestrian Robot II. EU-IST STREP, 2013-2017 (Coordinator).
- **BrainLinks-BrainTools**: Exzellenzcluster, DFG, 2012-2019.
- **Rovina**: Robots for Exploration, Digital Preservation and Visualization of Archeological Sites, EC, 2013-2015.
- **iView**: Intelligente vibrotaktil induzierte Raumwahrnehmung, BMBF, 2012-2014.
- **HYBRIS-C1**: Planning and Action Control under Uncertainty for Mobile Manipulation Tasks, DFG, 2012-2019.
- **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.
- Situationserkennung. 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.
- **E μ S:** Graduiertenkolleg Embedded Microsystems. Deutsche Forschungsgemeinschaft, 2005-2008.
- **CoSy:** Cognitive Systems for Cognitive Assistants. EU-IST IP, 2005-2008.
- **DESIRE:** Deutsche Service-Robotik-Initiative. Leitprojekt des BMBF, 2005-2008.
- **MultiRob:** Multi-Robot-Coordination. Teilprojekt im Transregio-SFB Raumkognition 2003-2014.
- **3D-Map:** Three-Dimensional Map Construction. Teilprojekt im Transregio-SFB Raumkognition, 2003-2014.
- **ObjectSpace:** Human and robot navigation in structured environments. Teilprojekt im Transregio-SFB Raumkognition, 2007-2014.
- **WEBFAIR:** Web-Based Tele-Presence on Trade-Fairs with Mobile Robots. EU-IST Projekt, 2001-2004.
- **TOURBOT:** Museum Tele-Presence through Robotic Avatars. EU-IST Projekt, 2000-2001.
- **Tele-Labor Robotik:** Wissenschaftsministerium des Landes NRW, 1997-1999.
- Dokumentation Informations- und Kommunikationstechnik NRW. Wissenschaftsministerium des Landes NRW, 1996-1997.
- Planung von Beleuchtung für Grubengebäude unter Tage. Ruhrkohle Bergbau AG, 1990-1992.

Abgeschlossene Doktorarbeiten

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 Agarwal, 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

Patente

- 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

Publikationen

BÜCHER / KONFERENZBÄNDE

- [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.

KAPITEL IN BÜCHERN / KOLLEKTIONEN

- [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. Martínez-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.

BEGUTACHTETE BETRÄGE IN ZEITSCHRIFTEN UND MAGAZINEN

- [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. Schirrmeyer, J. T. Springenberg, L. D. J. Fiederer, M. Glasstetter, K. Eggenberger, 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] 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.
- [20] 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.
- [21] 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.
- [22] 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.
- [23] 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.
- [24] H. Kretschmar, 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.
- [25] 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.
- [26] 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.
- [27] 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.
- [28] B. Frank, C. Stachniss, R. Schmedding, M. Teschner, and W. Burgard. Learning object deformation models for robot motion planning. *Robotics and Autonomous Systems*, 2014.
- [29] K. Wurm, H. Kretschmar, R. Kümmerle, C. Stachniss, and W. Burgard. Identifying vegetation from laser data in structured outdoor environments. *Robotics and Autonomous Systems*, 62:675–684, 2014.
- [30] 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.
- [31] 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.
- [32] 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.
- [33] K. Wurm, C. Dornhege, B. Nebel, W. Burgard, and C. Stachniss. Coordinating heterogeneous teams of robots using temporal symbolic planning. *Autonomous Robots*, 2013.
- [34] S. Grzonka, G. Grisetti, and W. Burgard. A Fully Autonomous Indoor Quadrotor. *IEEE Transactions on Robotics*, 8(1):90–100, 2012.
- [35] S. Grzonka, A. Karwath, F. Dijoux, and W. Burgard. Activity-based Indoor Mapping and Estimation of Human Trajectories. *IEEE Transactions on Robotics*, 8(1):234–245, 2012.
- [36] J. Sturm, C. Stachniss, and W. Burgard. A probabilistic framework for learning kinematic models of articulated objects. *Journal on Artificial Intelligence Research*, 41:477–526, 2011.

- [37] S. Chitta, J. Sturm, M. Piccoli, and W. Burgard. Tactile sensing for mobile manipulation. *IEEE Transactions on Robotics*, 27(3), 2011.
- [38] 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.
- [39] S. Bouabdallah, C. Bernes, 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.
- [40] B. Lau, K. Arras, and W. Burgard. Multi-model hypothesis group tracking and group size estimation. *International Journal of Social Robotics*, 2(1), 2010.
- [41] G. Grisetti, R. Kümmerle, C. Stachniss, and W. Burgard. A tutorial on graph-based SLAM. *IEEE Intelligent Transportation Magazine*, 2(4):31–43, 2010.
- [42] 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.
- [43] 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.
- [44] M. Luber, K. Arras, C. Plagemann, and W. Burgard. Classifying dynamic objects: An unsupervised learning approach. *Autonomous Robots*, 2009.
- [45] 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.
- [46] C. Stachniss, O. Martínez 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.
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Invited Talks

- International Conference On Computer Aided Design (ICCAD), 2019.
- World Robot Conference (WRC), 2018.
- International Conference on Informatics in Control, Automation and Robotics (ICINCO), 2017.
- International Conference for Artificial Intelligence (IJCAI), 2016.
- IEEE-RSJ International Conference for Intelligent Robots and Systems (IROS), 2016.
- International Conference on Robotics and Mechatronics (ICRoM), 2016.
- Australasian Conference on Artificial Intelligence, 2015.
- European Conference on Artificial Intelligence (ECAI), 2012.
- Workshop on Self-Organization of Adaptive Behavior (SOAVE), 2004.
- Automaticon 2004.

Professional Activities

CHAIRMANSHIPS / EDITORIAL BOARDS

- Program Chair of the IEEE International Conference on Robotics and Automation (ICRA), 2020.
- Local Arrangements Chair of Robotics - Science and Systems, 2019.
- Associate Editor 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 AAI Conference on Artificial Intelligence (AAAI), 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

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

MITGLIEDSCHAFTEN

- GI-Mitglied
- Senior IEEE-Mitglied
- Lebenslanges AAAI-Mitglied

TUTORIEN

- Tutorial on probabilistic techniques for robot navigation, IEEE/RSJ International Conference on Intelligent Robots and Systems, Daejon, 2016.
- Tutorial on probabilistic techniques for robot navigation, International Conference on Robotics and Mechatronics, Teheran, 2016.
- 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 Spatial 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.

PROGRAMMKOMITEES

- International Conference on Robotics and Automation (ICRA), 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.
- German Conference on Artificial Intelligence (KI), 1999, 2009.

DISSERTATIONSGUTACHTEN/PRÜFUNGSKOMMISSIONEN

- ETH Zürich
- Oxford University
- Universität Oerebroe
- Carnegie Mellon University
- Universität La Sapienza, Rome
- Universität Porto
- Universität Zaragoza
- KTH, Stockholm
- Katholieke Universiteit Leuven
- Universität Bonn
- EPFL Lausanne
- Technische Universität München
- Universität Bremen
- Australian National University
- Australian Center for Field Robotics / Universität Sydney
- Universität Pisa
- Karlsruhe Institute of Technology