

Sebastian Thrun, Ph.D.

Professor of Computer Science and Electrical Engineering
Director, Stanford Artificial Intelligence Lab (SAIL)

ADDRESS

Gates Building 154, 353 Serra Mall
Stanford Artificial Intelligence Lab
Stanford, CA 94305-9010, USA
Phone: (650) 723-2797
FAX: (650) 725-1449
Email: thrun@stanford.edu
Web: <http://robots.stanford.edu>

EDUCATION

- 1995 Dr. rer.-nat. (Ph.D.) in computer science and statistics, University of Bonn, Germany, summa cum laude.
- 1993 Diplom (M.Sc.) in computer science and statistics, University of Bonn, Germany.
- 1988 Vordiplom (B.Sc.) in computer science, economics, and medicine, University of Hildesheim, Germany.

ACADEMIC POSITIONS

- 2007– Professor of computer science and electrical engineering, Stanford University.
- 2003–2007 Associate professor of computer science and (since 2006) electrical engineering, Stanford University. Since 2004 director of the Stanford Artificial Intelligence Laboratory (SAIL).
- 1998–2003 Assistant professor and (since 2001) associate professor of computer science, robotics, and automated learning and discovery, Carnegie Mellon University.
- 1995–1998 Research Computer Scientist, Carnegie Mellon University.

INDUSTRIAL, AFFILIATE, AND CONSULTING POSITIONS

- 2009– Senior Advisor, Charles River Ventures.
- 2007– Principal Engineer, Google, Inc.

HONORS AND AWARDS

- 2008 PC World list *Best 100 Products of 2008* (Google Street View)
- 2007 Braunschweig Research Prize
Member, National Academy of Engineering.
Member, Deutsche Akademie der Naturforscher Leopoldina (German Academy of Sciences).
- 2006 Included in *Scientific American 50*

- World Technology Network Award (category: Information Technology) and WTN Fellow.
- AAAI Fellow (American Association of Artificial Intelligence).
- ECCAI Fellow (European Coordinating Committee for Artificial Intelligence).
- Vance D. and Arlene C. Coffman Scholar II, Stanford School of Engineering.
- Wired Magazine *best robot of all times*.
- Included in *Forbes Magazine E-Gang*.
- 2005 Leader of the Stanford Racing Team that won the DARPA Grand Challenge.
- Included in *Popular Science Brilliant Ten*.
- 2004 Honorable mention, 2004 IJCAI-JAIR best paper prize.
- 2003–2006 Reid and Polly Anderson Scholar and (until 2004) David Filo and Jerry Yang Faculty Scholar, Stanford School of Engineering.
- 2003 Best conference paper, International Conference of Field and Service Robotics (FSR).
- Best conference paper, IEEE International Conference on Robotics and Automation (ICRA).
- Best student conference paper, International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS).
- 2002 Finmeccanica endowed faculty chair, School of Computer Science, Carnegie Mellon University.
- 2001 Olympus award, German society for pattern recognition (DAGM).
- 2000 Best conference paper, IEEE International Conference on Robotics and Automation (ICRA).
- 1999 Best conference paper, German Conference of the German society for pattern recognition (DAGM).
- 1999–2003 NSF CAREER.
- 1998 Best conference paper, National Conference on Artificial Intelligence (AAAI).
- 1996 First place, AAAI autonomous mobile robot competition.
- 1994 Second place, AAAI autonomous mobile robot competition.

FIELD SERVICE

- 2013 General Chair, IJCAI Conference.
- 2009– President, Robotics Science and Systems Foundation.
- 2005–2008 AAAI Councilor.
- 2005 Founding conference chair, Robotics Science and Systems conference (RSS), Boston.
- Co-chair, International Symposium on Robotics Research (ISRR), San Francisco.
- 2003–2009 Vice President for Development, NIPS Foundation.

- 2003 Program co-chair, International Conference on Field and Service Robotics (FSR), Japan.
- 2002–2003 Program chair (2002) and general chair (2003), Neural Information Processing Systems conference (NIPS), Vancouver.
- 1998 Conference chair, Conference on Automated Learning and Discovery (CONALD).
- 1990– Member of numerous editorial boards and organizing committees.

MAJOR PLENARY KEYNOTES

- 2009 International Conference on Automated Planning and Scheduling, Thessaloniki, Greece.
- International Conference on Engineering Design, Stanford.
- Electric Aircraft Symposium, San Bruno.
- Annual Conference, Society of Automotive Engineers (SAE), Detroit.
- 2008 Linux World, Opening Keynote, San Francisco.
- International Conference on Multimedia and Entertainment (ICME), Germany.
- 2007 Institute of Navigation (ION) GNSS, Fort Worth.
- Florida Artificial Intelligence Conference, Key West.
- 2006 IEEE Sensors, Korea.
- MIT Emerging Technologies Conference, Cambridge.
- Automated Software Engineering Conference (ASE), Tokyo.
- European Conference on Machine Learning (ECML), Berlin.
- IFAC Mechatronics, Heidelberg.
- IEEE World Congress on Computational Intelligence (WCCI), Vancouver.
- Innovative Applications of Artificial Intelligence (IAAI), Boston.
- Workshop on Algorithmic Foundations of Robotics (WAFR), New York City.
- International Multisensory Research Forum (IMRF), Dublin.
- German National Conference on AI (KI), Bremen.
- International Symposium on 3D Data Processing, Visualization and Transmission (3DPVT), Chapel Hill.
- Sensors Expo and Conference, Chicago.
- 2005 Neural information processing systems (NIPS), Vancouver.
- German National Conference on AI (KI), Koblenz.
- International Conference on Advanced Robotics (ICAR), Seattle.
- DARPA Cognitive Systems Conference, Arlington.
- 2004 IEEE International Conference on Intelligent Robots and Systems (IROS), Sendai.
- National Conference on Artificial Intelligence (AAAI), San Jose.

- 2002 International Conference on Uncertainty in Artificial Intelligence (UAI), Edmonton.
European Conference on Artificial Intelligence (ECAI), Lyon.
International Conference on Machine Learning (ICML), Sydney.
- 2001 Belgium Netherlands Artificial Intelligence Conference (BNAIC), Amsterdam.
International Conference on Field and Service Robotics (FSR), Helsinki.
- 2000 Joint Brazilian and Ibero-American AI conference (SBIA/IBERAMIA), Atibaia, Brazil.
Australian Conference on Robotics and Automation (ACRA), Melbourne.
- 1999 German National Conference on AI (KI), Bonn.
Neuro-Fuzzy Conference, Leipzig.

BOOKS (MONOGRAPHS)

- [1] M. Montemerlo and S. Thrun. *The FastSLAM Algorithm for Simultaneous Localization and Mapping*. Springer Tracts in Advanced Robotics, forthcoming.
- [2] S. Thrun, W. Burgard, and D. Fox. *Probabilistic Robotics*. MIT Press, Cambridge, MA, 2005.
- [3] H. Choset, K. Lynch, S. Hutchinson, G. Kantor, W. Burgard, L. Kavraki, and S. Thrun. *Principles of Robotic Motion: Theory, Algorithms, and Implementation*. MIT Press, Cambridge, MA, 2004.
- [4] S. Thrun. *Explanation-Based Neural Network Learning: A Lifelong Learning Approach*. Kluwer Academic Publishers, Boston, MA, 1996.

BOOKS (EDITED VOLUMES)

- [5] S. Thrun, R.A. Brooks, and H. Durrant-Whyte, editors. *Robotics Research: Results of the 12th International Symposium ISRR*. Springer Tracts in Advanced Robotics, Berlin, Germany, 2007.
- [6] S. Yuta, H. Asama, S. Thrun, E. Prassler, and T. Tsubouchi, editors. *Field and Service Robotics: Recent Advances in Research and Applications*. Springer Tracts in Advanced Robotics, Berlin, 2006.
- [7] S. Thrun, G. Sukhatme, S. Schaal, and O. Brock, editors. *Robotics Science and Systems I*. MIT Press, Cambridge, CA, 2005.
- [8] S. Thrun, L. Saul, and K. Obermayer, editors. *Advances in Neural Information Processing Systems 16*. MIT Press, Cambridge, MA, 2004.
- [9] S. Becker, S. Thrun, and K. Obermayer, editors. *Advances in Neural Information Processing Systems 15*. MIT Press, Cambridge, MA, 2003.
- [10] S. Thrun and L.Y. Pratt, editors. *Learning To Learn*. Kluwer Academic Publishers, Boston, MA, 1998.
- [11] J. Franklin, T. Mitchell, and S. Thrun, editors. *Recent Advances in Robot Learning*. Kluwer Academic Publishers, Boston, MA, 1996.

CHAPTERS IN BOOK

- [12] S. Thrun. Simultaneous localization and mapping. In M.E. Jefferies and W.-K. Yeap, editors, *Spatial Mapping Approaches in*

Robotic and Natural Mapping Systems. Springer Tracts in Advanced Robotics, Berlin, 2006.

- [13] A. Lookingbill, D. Lieb, and S. Thrun. Optical flow approaches for self-supervised learning in autonomous mobile robot navigation. In C. Laugier and R. Chatila, editors, *Navigation in Open and Dynamic Environments*. Springer, Berlin, Germany, 2006.
- [14] D. Margaritis, S. Thrun, and C. Faloutsos. Ncube: Fast approximate database queries using bayesian networks. In A. Mittal, A. Kassim, and T. Tan, editors, *Bayesian Network Technologies: Applications and Graphical Models*. IIT India, 2006.
- [15] S. Thrun. Robotics. In *Chapter 25 of "Artificial Intelligence: A Modern Approach (second edition)" by S. Russell and P. Norvig*. Prentice Hall, Englewood Cliffs, NJ, 2002.
- [16] S. Thrun. Robotic mapping: A survey. In G. Lakemeyer and B. Nebel, editors, *Exploring Artificial Intelligence in the New Millennium*. Morgan Kaufmann, 2002.
- [17] D. Fox, S. Thrun, W. Burgard, and F. Dellaert. Particle filters for mobile robot localization. In A. Doucet, N. de Freitas, and N. Gordon, editors, *Sequential Monte Carlo Methods in Practice*, pages 499–516. Springer Verlag, 2001.
- [18] D. Fox, W. Burgard, and S. Thrun. Markov localization for reliable robot navigation and people detection. In *Modeling and Planning for Sensor-Based Intelligent Robot Systems*. Springer Verlag, Berlin, 1999.
- [19] S. Thrun, A. Bücken, W. Burgard, D. Fox, T. Fröhlinghaus, D. Henning, T. Hofmann, M. Krell, and T. Schmidt. Map learning and high-speed navigation in RHINO. In D. Kortenkamp, R.P. Bonasso, and R. Murphy, editors, *AI-based Mobile Robots: Case Studies of Successful Robot Systems*, pages 21–52. MIT Press, Cambridge, MA, 1998.
- [20] S. Thrun and J. O’Sullivan. Clustering learning tasks and the selective cross-task transfer of knowledge. In S. Thrun and L.Y. Pratt, editors, *Learning To Learn*. Kluwer Academic Publishers, 1998.
- [21] S. Thrun. Lifelong learning algorithms. In S. Thrun and L.Y. Pratt, editors, *Learning To Learn*. Kluwer Academic Publishers, 1998.
- [22] S. Thrun and L.Y. Pratt. Learning to learn: Introduction and overview. In S. Thrun and L.Y. Pratt, editors, *Learning To Learn*. Kluwer Academic Publishers, 1998.
- [23] J. O’Sullivan, T. Mitchell, and S. Thrun. Explanation-based neural network learning for mobile robot perception. In K. Ikeuchi and M. Veloso, editors, *Symbolic Visual Learning*. Oxford University Press, 1997.
- [24] T. Mitchell and S. Thrun. Learning analytically and inductively. In D. Steier and T. Mitchell, editors, *Mind Matters: A Tribute to Allen Newell*. Lawrence Erlbaum Associates Publishers, 1996.

- [25] S. Thrun. Exploration in active learning. In M. Arbib, editor, *Handbook of Brain and Cognitive Science*. MIT Press, 1995.
- [26] S. Thrun. A lifelong learning perspective for mobile robot control. In V. Graefe, editor, *Intelligent Robots and Systems*. Elsevier, 1995.
- [27] S. Thrun. The role of exploration in learning control. In D.A. White and D.A. Sofge, editors, *Handbook for Intelligent Control: Neural, Fuzzy and Adaptive Approaches*. Van Nostrand Reinhold, Florence, Kentucky 41022, 1992.

REFEREED JOURNAL ARTICLES

- [28] S. Levine, P. Krähenbühl, S. Thrun, and V. Koltun. Gesture controllers. *ACM SIGGRAPH*, 2010.
- [29] D. Dolgov, S. Thrun, M. Montemerlo, and J. Diebel. Path planning for autonomous vehicles in unknown semi-structured environments. *The International Journal of Robotics Research*, 2009. In Press.
- [30] A. Petrovskaya and S. Thrun. Model based vehicle tracking for autonomous driving in urban environments. *Autonomous Robots*, 2009.
- [31] M. Montemerlo, J. Becker, S. Bhat, H. Dahlkamp, D. Dolgov, S. Ettinger, D. Haehnel, T. Hilden, G. Hoffmann, B. Huhnke, D. Johnston, S. Klumpp, D. Langer, A. Levandowski, J. Levinson, J. Marcil, D. Orenstein, J. Paefgen, I. Penny, A. Petrovskaya, M. Pflueger, G. Stanek, D. Stavens, A. Vogt, and S. Thrun. Junior: The stanford entry in the urban challenge. *Journal of Field Robotics*, 2008.
- [32] S. Park, F. Pfenning, and S. Thrun. A probabilistic language based upon sampling functions. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 2008. in press.
- [33] M. Likhachev, D. Ferguson, G. Gordon, A. Stentz, , and S. Thrun. Anytime search in dynamic graphs. *Artificial Intelligence*, 172(14):1613–1643d, 2008.
- [34] M. Matsuoka, A. Chen, S. Singh, A.Y. Ng, and S. Thrun. Autonomous helicopter tracking and localization using a self-surveying camera array. *International Journal of Robotics Research*, Forthcoming.
- [35] S. Thrun, M. Montemerlo, H. Dahlkamp, D. Stavens, A. Aron, J. Diebel, P. Fong, J. Gale, M. Halpenny, G. Hoffmann, K. Lau, C. Oakley, M. Palatucci, V. Pratt, P. Stang, S. Strohband, C. Dupont, L.-E. Jendrossek, C. Koelen, C. Markey, C. Rummel, J. van Niekerk, E. Jensen, P. Alessandrini, G. Bradski, B. Davies, S. Ettinger, A. Kaehler, A. Nefian, and P. Mahoney. Stanley, the

- robot that won the DARPA Grand Challenge. *Journal of Field Robotics*, 23(9):661–692, 2006.
- [36] J. Pineau, G. Gordon, and S. Thrun. Anytime point-based approximations for large POMDPs. *Journal of Artificial Intelligence Research*, 27:335–380, 2006.
- [37] D. Lookingbill, J. Rogers, J. Curry, D. Lieb, and S. Thrun. Reverse optical flow for self-supervised adaptive autonomous robot navigation. *International Journal on Computer Vision (IJCV)*, 2006. Forthcoming.
- [38] J. Diebel, S. Thrun, and M. Brünig. A bayesian method for probable surface reconstruction and decimation. *ACM Transactions on Graphics*, 25(1), 2006.
- [39] B.P. Gerkey, S. Thrun, and G. Gordon. Visibility-based pursuit-evasion with limited field of view. *International Journal on Robotics Research*, 25(4):299–316, 2006.
- [40] S. Thrun and M. Montemerlo. The GraphSLAM algorithm with applications to large-scale mapping of urban structures. *International Journal on Robotics Research*, 25(5/6):403–430, 2005.
- [41] 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 and Automation*, 11(4), 2005.
- [42] N. Roy, G. Gordon, and S. Thrun. Finding approximate POMDP solutions through belief compression. *Journal of Artificial Intelligence Research*, 23:1–40, 2005.
- [43] M. Bennewitz, W. Burgard, G. Cielniak, and S. Thrun. Learning motion patterns of people for compliant motion. *International Journal of Robotics Research*, 24(1), 2005.
- [44] S. Thrun, C. Martin, Y. Liu, D. Hähnel, R. Emery-Montemerlo, D. Chakrabarti, and W. Burgard. A real-time expectation maximization algorithm for acquiring multi-planar maps of indoor environments with mobile robots. *IEEE Transactions on Robotics*, 20(3):433–443, 2004.
- [45] S. Thrun, Y. Liu, D. Koller, A.Y. Ng, Z. Ghahramani, and H. Durrant-Whyte. Simultaneous localization and mapping with sparse extended information filters. *International Journal of Robotics Research*, 23(7–8), 2004.
- [46] S. Thrun. Towards a framework for human-robot interaction. *Human Computer Interaction*, 19(1&2):9–24, 2004.
- [47] J. Pineau, M. Montemerlo, N. Roy, S. Thrun, and M. Pollack. Towards robotic assistants in nursing homes: challenges and results. *Robotics and Autonomous Systems*, 42(3–4):271–281, 2003.
- [48] S. Thrun. Learning occupancy grids with forward sensor models. *Autonomous Robots*, 15:111–127, 2003.

- [49] D. Hähnel, W. Burgard, and S. Thrun. Learning compact 3D models of indoor and outdoor environments with a mobile robot. *Robotics and Autonomous Systems*, 44:15–17, 2003.
- [50] 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(2):89–99, 2002.
- [51] F. Dellaert, S.M. Seitz, C. Thorpe, and S. Thrun. EM, MCMC, and chain flipping for structure from motion with unknown correspondence. *Machine Learning*, 50(1-2):45–71, 2003.
- [52] S. Thrun. A probabilistic online mapping algorithm for teams of mobile robots. *International Journal of Robotics Research*, 20(5):335–363, 2001.
- [53] S. Thrun, D. Fox, W. Burgard, and F. Dellaert. Robust Monte Carlo localization for mobile robots. *Artificial Intelligence*, 128(1-2):99–141, 2000.
- [54] S. Thrun, M. Beetz, M. Bennewitz, W. Burgard, A.B. Cremers, F. Dellaert, D. Fox, D. Hähnel, C. Rosenberg, N. Roy, J. Schulte, and D. Schulz. Probabilistic algorithms and the interactive museum tour-guide robot Minerva. *International Journal of Robotics Research*, 19(11):972–999, 2000.
- [55] S. Waldherr, S. Thrun, and R. Romero. A gesture-based interface for human-robot interaction. *Autonomous Robots*, 9(2):151–173, 2000.
- [56] D. Fox, W. Burgard, H. Kruppa, and S. Thrun. A probabilistic approach to collaborative multi-robot localization. *Autonomous Robots*, 8(3), 2000.
- [57] D. Fox, W. Burgard, and S. Thrun. Markov localization for mobile robots in dynamic environments. *Journal of Artificial Intelligence Research*, 11:391–427, 1999.
- [58] 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, 1999.
- [59] K. Nigam, A. McCallum, S. Thrun, and T. Mitchell. Learning to classify text from labeled and unlabeled documents. *Machine Learning*, 39(2/3):1–32, 1998.
- [60] 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, 253–271 (joint issue).
- [61] S. Thrun. Learning metric-topological maps for indoor mobile robot navigation. *Artificial Intelligence*, 99(1):21–71, 1998.
- [62] S. Thrun. Bayesian landmark learning for mobile robot localization. *Machine Learning*, 33(1):41–76, 1998.

- [63] D. Fox, W. Burgard, and S. Thrun. Active Markov localization for mobile robots. *Robotics and Autonomous Systems*, 25(3-4):195–207, 1998.
- [64] D. Fox, W. Burgard, and S. Thrun. The dynamic window approach to collision avoidance. *IEEE Robotics and Automation*, 4(1), 1997.
- [65] S. Thrun. An approach to learning mobile robot navigation. *Robotics and Autonomous Systems*, 15:301–319, 1996.
- [66] S. Thrun and T. Mitchell. Lifelong robot learning. *Robotics and Autonomous Systems*, 15:25–46, 1995.
- [67] K. Möller and S. Thrun. ARC: Adaptive Roboterkontrolle mit Künstlichen Neuronalen Netzen. *Wirtschaftsinformatik*, 33(5):408–419, 1991. In German.

MAGAZINE AND UNREFEREED JOURNAL ARTICLES

- [68] S. Thrun. Towards robotic cars. *Communications of the ACM*, April 2010.
- [69] S. Thrun. Why we compete in DARPA’s urban challenge autonomous robot race. *Communications of the ACM*, 50(10):29–31, 2007.
- [70] S. Thrun. A personal account on the development of stanley, the robot that won the darpa grand challenge. *AI Magazine*, 27(4):69–82, 2006.
- [71] S. Thrun. Teaching challenge. *IEEE Robotics and Automation Magazine*, 13:4, 2006.
- [72] V. Verma, R. Simmons, G. Gordon, and S. Thrun. Real-time fault diagnosis. *IEEE Robotics and Automation Magazine*, 11(2):56–66, 2004.
- [73] S. Thrun. Probabilistic robotics. *Communications of the ACM*, 45(3):52–57, 2002.
- [74] S. Thrun. Probabilistic algorithms in robotics. *AI Magazine*, 21(4):93–109, 2000.
- [75] S. Thrun, J. Schulte, and C. Rosenberg. Interaction with mobile robots in public places. *IEEE Intelligent Systems*, pages 7–11, July/August 2000.
- [76] S. Thrun and M. Littman. Book review: Reinforcement Learning by R. Sutton and A. Barto. *AI Magazine*, 21(1):103–105, 2000.
- [77] D. Schulz, W. Burgard, A.B. Cremers, D. Fox, and S. Thrun. Web interfaces for mobile robots in public places. *IEEE Magazine on Robotics and Automation*, 7(1):48–57, 2000.
- [78] S. Thrun, C. Faloutsos, T. Mitchell, and L. Wasserman. Automated learning and discovery: State-of-the-art and research topics in a rapidly growing field. *AI Magazine*, 20(3), 1999.

- [79] S. Thrun. When robots meet people: Research directions in mobile robotics. *IEEE Intelligent Systems*, May/June 1998.
- [80] S. Thrun. To know or not to know: On the utility of models in mobile robotics. *AI Magazine*, 18(1):47–54, 1997.
- [81] A.B. Cremers, J. Buhmann, and S. Thrun. Komplexe lernende Systeme: Der mobile Roboter RHINO. *Künstliche Intelligenz*, 2, 1995. In German.
- [82] 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(1), 1995.
- [83] R. Simmons, S. Thrun, C. Athanassiou, J. Cheng, L. Chrisman, R. Goodwin, G.-T. Hsu, and H. Wan. Odysseus: An autonomous mobile robot (extended abstract). *AI Magazine*, 13, 1992.

REFEREED CONFERENCE PAPERS

- [84] S. Schuon, D. Chan, C. Yan, C. Theobalt, and S. Thrun. 3d shape scanning with a time-of-flight camera. In *Proceedings of Twenty-Third IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, California, 2010. IEEE.
- [85] J. Dolson, J. Baek, C. Plagemann, and S. Thrun. Super-resolution of range data in dynamic environments using a gaussian framework. In *Proceedings of Twenty-Third IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, California, 2010. IEEE.
- [86] D. Stavens and Sebastian Thrun. Unsupervised learning of invariant features using video. In *Proceedings of Twenty-Third IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, California, 2010. IEEE.
- [87] V. Ganapathi, C. Plagemann, D. Koller, and S. Thrun. Real time motion capture using a single time-of-flight camera. In *Proceedings of Twenty-Third IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, San Francisco, California, 2010. IEEE.
- [88] J. Levinson and S. Thrun. Robust vehicle localization in urban environments using probabilistic maps. In *Proceedings of the IEEE Conference on Robotics and Automation (ICRA)*, Anchorage, Alaska, 2010. IEEE.
- [89] M. Werling, J. Ziegler, S. Kammel, and S. Thrun. Optimal trajectory generation for dynamic street scenarios in a frenét frame. In *Proceedings of the IEEE Conference on Robotics and Automation (ICRA)*, Anchorage, Alaska, 2010. IEEE.

- [90] J. Z. Kolter, C. Plagemann, D. T. Jackson, A. Y. Ng, and S. Thrun. A probabilistic approach to mixed open-loop and closed-loop control, with application to extreme autonomous driving. In *Proceedings of the IEEE Conference on Robotics and Automation (ICRA)*, Anchorage, Alaska, 2010. IEEE.
- [91] C. Plagemann, V. Ganapathi, D. Koller, and S. Thrun. Realtime identification and localization of body parts from depth images. In *Proceedings of the IEEE Conference on Robotics and Automation (ICRA)*, Anchorage, Alaska, 2010. IEEE.
- [92] J.T. Matthews, S. Sereika, S. Engberg, J. C. Rogers, and S. Thrun. Responsiveness of older adults to navigational guidance from mobile robots in retirement communities. In *ISG 7th World Conference*, Vancouver, Canada, May 2010. International Society for Gerontechnology.
- [93] S. Schuon, C. Theobalt, J. Davis, and S. Thrun. Lidarboost: Depth superresolution for ToF 3D shape scanning. In *Proceedings of Conference for Vision and Pattern Recognition (CVPR)*, 2009.
- [94] D. Dolgov and S. Thrun. Autonomous driving in semi-structured environments: Mapping and planning. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Kobe, Japan, 2009.
- [95] R. Kümmerle, D. Hähnel, D. Dolgov, S. Thrun, and W. Burgard. Autonomous driving in a multi-level parking structure. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Kobe, Japan, 2009.
- [96] P. Abbeel, D. Dolgov, A. Ng, and S. Thrun. Apprenticeship learning for motion planning, with application to parking lot navigation. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, Nice, France, 2008. IEEE.
- [97] D. Dolgov, M. Montemerlo, and S. Thrun. Path planning for autonomous driving in unknown environments. In *Proceedings of the International Symposium on Experimental Robotics (ISER)*, Athens, Greece, 2008. Springer Tracts in Advanced Robotics (STAR).
- [98] A. Petrovskaya and S. Thrun. Efficient techniques for dynamic vehicle detection. In *Proceedings of the International Symposium on Experimental Robotics (ISER)*, Athens, Greece, 2008. Springer Tracts in Advanced Robotics (STAR).
- [99] D. Dolgov and S. Thrun. Detection of principle directions in unknown environments for autonomous navigation. In O. Brock, J. Trinkle, and F. Ramos, editors, *Proceedings of the Robotics Science and Systems IV*, Zurich, Switzerland, 2008.
- [100] A. Petrovskaya and S. Thrun. Model based vehicle tracking for autonomous driving in urban environments. In O. Brock, J. Trinkle, and F. Ramos, editors, *Proceedings of the Robotics Science and Systems IV*, Zurich, Switzerland, 2008.

- [101] M. Montemerlo, J. Becker, S. Bhat, H. Dahlkamp, D. Dolgov, S. Ettinger, D. Haehnel, T. Hilden, G. Hoffmann, B. Huhnke, D. Johnston, S. Klumpp, D. Langer, A. Levandowski, J. Levinson, J. Marcil, D. Orenstein, J. Paefgen, I. Penny, A. Petrovskaya, M. Pflueger, G. Stanek, D. Stavens, A. Vogt, and S. Thrun. Junior, the stanford racing team’s robot in the 2007 darpa urban challenge. In *Proceedings of the Symposium on Automation, Assistance and Embedded Real Time Platforms for Transportation (AAET)*, Braunschweig, Germany, 2008.
- [102] Y.M. Kim, D. Chan, C. Theobalt, and S. Thrun. Design and calibration of a multi-view TOF sensor fusion system. In *Proceedings of the CVPR Workshop on Time of Flight Camera based Computer Vision*, Anchorage, Alaska, 2008.
- [103] S. Schuon, C. Theobalt, J. Davis, and S. Thrun. High-quality scanning using time-of-flight depth superresolution. In *Proceedings of the CVPR Workshop on Time of Flight Camera based Computer Vision*, Anchorage, Alaska, 2008.
- [104] D. Dolgov, M. Montemerlo, and S. Thrun. Path planning for autonomous driving in unknown environments. In *Proceedings of the International Symposium on Experimental Robotics (ISER)*, Athens, Greece, 2008. Springer Tracts in Advanced Robotics (STAR).
- [105] A. Petrovskaya and S. Thrun. Efficient techniques for dynamic vehicle detection. In *Proceedings of the International Symposium on Experimental Robotics (ISER)*, Athens, Greece, 2008. Springer Tracts in Advanced Robotics (STAR).
- [106] E. de Aguiar, C. Stoll, C. Theobalt, N. Ahmed, H.-P. Seidel, and S. Thrun. Performance capture from sparse multi-view stereo. In *Proceedings of SIGGRAPH*, 2008.
- [107] N. Ahmed, C. Theobalt, H.-P. Seidel, and S. Thrun. Robust fusion of dynamic shape and normal capture for high-quality reconstruction of time-varying geometry. In *Proceedings of the IEEE Conference on Vision and Pattern Recognition (CVPR)*, Anchorage, Alaska, 2008. IEEE.
- [108] N. Ahmed, C. Theobalt, C. Roessl, S. Thrun, and H.-P. Seidel. Dense correspondence finding for parametrization-free animation reconstruction from video. In *Proceedings of the IEEE Conference on Vision and Pattern Recognition (CVPR)*, Anchorage, Alaska, 2008. IEEE.
- [109] E. de Aguiar, C. Theobalt, S. Thrun, and H.-P. Seidel. Automatic conversion of mesh animations into skeleton-based animations. In *Proceedings of Eurographics*, Hellas, Crete, Greece, 2008. Eurographics.
- [110] K. Loewke, D. Camarillo, K. Salisbury, and S. Thrun. Deformable image mosaicing for optical biopsy. In *Proceedings of the Inter-*

national Conference on Computer Vision (ICCV), Rio de Janeiro, Brazil. IEEE.

- [111] J. Levinson, M. Montemerlo, and S. Thrun. Map-based precision vehicle localization in urban environments. In W. Burgard, O. Brock, and C. Stachniss, editors, *Proceedings of the Robotics Science and Systems III*, Atlanta, GA, 2007.
- [112] G. Hoffmann, C. Tomlin, M. Montemerlo, and S. Thrun. Autonomous automobile trajectory tracking for offroad driving: Controller design, experimental validation, and racing. In *Proceedings of the American Control Conference*, New York City, NY, 2007.
- [113] D. Stavens, G. Hoffmann, and S. Thrun. Online speed adaptation using supervised learning for high-speed, off-road autonomous driving. In *Proceedings of the International Joint Conference on Artificial Intelligence (IJCAI)*, Hyderabad, India, 2007. IJCAI.
- [114] D. Stavens and S. Thrun. A self-supervised terrain roughness estimator for off-road autonomous driving. In *Proceedings of the Conference on Uncertainty in AI (UAI)*, 2006.
- [115] M. Montemerlo, S. Thrun, H. Dahlkamp, D. Stavens, and S. Strohband. Winning the DARPA Grand Challenge with an AI robot. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Boston, MA, 2006. AAAI.
- [116] H. Dahlkamp, A. Kaehler, D. Stavens, S. Thrun, and G. Bradski. Self-supervised monocular road detection in desert terrain. In G. Sukhatme, S. Schaal, W. Burgard, and D. Fox, editors, *Proceedings of the Robotics Science and Systems Conference*, Philadelphia, PA, 2006.
- [117] B. Schumitsch, S. Thrun, and L. Guibas. The information management kalman filter (IMKF). In G. Sukhatme, S. Schaal, W. Burgard, and D. Fox, editors, *Proceedings of the Robotics Science and Systems Conference*, Philadelphia, PA, 2006.
- [118] S. Thrun, M. Montemerlo, and A. Aron. Probabilistic terrain analysis for high-speed desert driving. In G. Sukhatme, S. Schaal, W. Burgard, and D. Fox, editors, *Proceedings of the Robotics Science and Systems Conference*, Philadelphia, PA, 2006.
- [119] A. Petrovskaya, O. Khatib, S. Thrun, and A.Y. Ng. Bayesian estimation for autonomous object manipulation based on tactile sensors. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Orlando, Florida, 2006.
- [120] S. Thrun. Affine structure from sound. In *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2005. MIT Press.
- [121] B. Schumitsch, S. Thrun, G. Bradski, and K. Olukotun. The information-form data association filter. In *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2005. MIT Press.

- [122] J. Diebel and S. Thrun. An application of markov random fields to range sensing. In *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2005. MIT Press.
- [123] S. Thrun and B. Wegbreit. Shape from symmetry. In *Proceedings of the International Conference on Computer Vision (ICCV)*, Beijing, China, 2005. IEEE.
- [124] D. Anguelov, P. Srinivasan, D. Koller, S. Thrun, J. Rodgers, and J. Davis. SCAPE: Shape completion and animation of people. 2005.
- [125] R. Kaestner, S. Thrun, M. Montemerlo, and M. Whalley. A non-rigid approach to scan alignment and change detection using range sensor data. Port Douglas, Australia, 2005. Springer Verlag.
- [126] M. Matsuoka, A. Chen, S. Singh, A.Y. Ng, and S. Thrun. Autonomous helicopter tracking and localization using a self-calibrating camera array. In *Proceedings of the Symposium on Field and Service Robotics*, Port Douglas, Australia, 2005. Springer Verlag.
- [127] R. Biswas and S. Thrun. A distributed approach to passive localization. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Pittsburgh, PA, 2005. AAAI.
- [128] M. Paskin and S. Thrun. Robotic mapping with polygonal markov random fields. In *Proceedings of the Conference on Uncertainty in AI (UAI)*, Edinburgh, Scotland, 2005.
- [129] D. Lieb, A. Lookingbill, and S. Thrun. Adaptive road following using self-supervised learning and reverse optical flow. In S. Thrun, G. Sukhatme, S. Schaal, and O. Brock, editors, *Proceedings of Robotics Science and Systems*, Cambridge, MA, 2005. MIT Press.
- [130] P. Abbeel, A. Coates, M. Montemerlo, A. Ng, and S. Thrun. Discriminative training of Kalman filters. In S. Thrun, G. Sukhatme, S. Schaal, and O. Brock, editors, *Proceedings of Robotics Science and Systems*, Cambridge, MA, 2005. MIT Press.
- [131] J. Shin, N. Lee, S. Thrun, and L. Guibas. Lazy inference of object identities in wireless sensor networks. In *Fourth International Conference on Information Processing in Sensor Networks*, Los Angeles, CA, 2005.
- [132] D. Ferguson, M. Likhachev, G. Gordon, A. Stentz, and S. Thrun. Anytime dynamic A*: An anytime, replanning algorithm. In S. Bifulco, K. Myers, and K. Rajan, editors, *Proceedings of the International Conference on Automated Planning and Scheduling*, 2005.
- [133] R. Emery-Montemerlo, G. Gordon, J. Schneider, and S. Thrun. Game theoretic control for robot teams. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Barcelona, Spain, 2005.

- [134] A. Lookingbill, D. Lieb, D. Stavens, and S. Thrun. Learning activity-based ground models from a moving helicopter platform. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Barcelona, Spain, 2005.
- [135] K. Patel, W. Macklem, and S. Thrun. Active sensor actuation at high speeds. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, Barcelona, Spain, 2005.
- [136] S. Park, F. Pfenning, and S. Thrun. A probabilistic programming language based upon sampling functions. In *Proceedings of the ACM Symposium on Principles of Programming Languages (POPL)*, Long Beach, CA, 2005. ACM SIGPLAN - SIGACT.
- [137] M. Likhachev, G. Gordon, and S. Thrun. Planning for Markov decision processes with sparse stochasticity. In L. Saul, Y. Weiss, and L. Bottou, editors, *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2004. MIT Press.
- [138] D. Anguelov, P. Srinivasan, H.-C. Pang, D. Koller, S. Thrun, and J. Davis. The correlated correspondence algorithm for unsupervised registration of nonrigid surfaces. In L. Saul, Y. Weiss, and L. Bottou, editors, *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2004. MIT Press.
- [139] J.T. Matthews, S.J. Engberg, J. Glover, M. Pollack, and S. Thrun. Robotic assistants for the elderly: Designing and conducting field studies. In *Proceedings of the Tenth IASTED International Conference on Robotics and Applications*, Hawaii, HI, 2004.
- [140] R. Biswas and S. Thrun. A passive approach to sensor network localization. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, 2004.
- [141] J. Diebel, K. Reuterswärd, J. Davis, and S. Thrun. Simultaneous localization and mapping with active stereo vision. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, 2004.
- [142] D. Anguelov, D. Koller, H. Pang, P. Srinivasan, and S. Thrun. Recovering articulated object models from 3d range data. In *Proceedings of the Annual Conference on Uncertainty in AI (UAI)*, 2004.
- [143] M. Rosencrantz, G. Gordon, and S. Thrun. Learning low dimensional predictive representations. In *Proceedings of the Twenty-First International Conference on Machine Learning*, Banff, Alberta, Canada, 2004.
- [144] R. Dearden, F. Huttner, R. Simmons, V. Verma, S. Thrun, and T. Willeke. Real-time fault detection and situational awareness for rovers: Report on the mars technology program task. In *Proceedings of IEEE Aerospace Conference*, Big Sky, MY, March 2004.
- [145] R. Emery-Montemerlo, G. Gordon, J. Schneider, and S. Thrun. Approximate solutions for partially observable stochastic games with

- common payoffs. In *Proceedings of Autonomous Agents and Multi-Agent Systems*, New York, NY, 2004.
- [146] M. Montemerlo and S. Thrun. A multi-resolution pyramid for outdoor robot terrain perception. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, San Jose, CA, 2004. AAAI.
- [147] B. Gerkey, S. Thrun, and G. Gordon. Clear the building: Pursuit-evasion with teams of robots. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, San Jose, CA, 2004. AAAI.
- [148] R. Biswas, L. Guibas, and S. Thrun. A probabilistic approach to inference with limited information in sensor networks. In *Proceedings of the 3rd International Symposium on Information Processing in Sensor Networks*, 2004.
- [149] C. Baker, A. Morris, D. Ferguson, S. Thayer, C. Whittaker, Z. Omohundro, C. Reverte, W. Whittaker, D. Hähnel, and S. Thrun. A campaign in autonomous mine mapping. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2004.
- [150] J. Glover, S. Thrun, and J.T. Matthews. Learning user models of mobility-related activities through instrumented walking aids. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2004.
- [151] A. Nüchter, H. Surmann, K. Lingemann, J. Hertzberg, and S. Thrun. 6D SLAM with application in autonomous mine mapping. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2004.
- [152] D. Anguelov, D. Koller, E. Parker, and S. Thrun. Detecting and modeling doors with mobile robots. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2004.
- [153] D. Ferguson, T. Stentz, and S. Thrun. PAO* for planning with hidden state. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2004.
- [154] D. Ferguson, A. Morris, D. Hähnel, C. Baker, Z. Omohundro, C. Reverte, S. Thayer, W. Whittaker, W. Whittaker, W. Burgard, and S. Thrun. An autonomous robotic system for mapping abandoned mines. In S. Thrun, L. Saul, and B. Schölkopf, editors, *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2003. MIT Press.
- [155] C. Bererton, G. Gordon, and S. Thrun. Auction mechanism design for multi-robot coordination. In S. Thrun, L. Saul, and B. Schölkopf, editors, *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2003. MIT Press.
- [156] M. Likhachev, G. Gordon, and S. Thrun. ARA*: Anytime A* search with provable bounds on sub-optimality. In S. Thrun, L. Saul, and B. Schölkopf, editors, *Proceedings of Conference on*

Neural Information Processing Systems (NIPS), Cambridge, MA, 2003. MIT Press.

- [157] J. Pineau, G. Gordon, and S. Thrun. Applying metric trees to belief-point POMDPs. In S. Thrun, L. Saul, and B. Schölkopf, editors, *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, Cambridge, MA, 2003. MIT Press.
- [158] D. Hähnel, D. Fox, W. Burgard, and S. Thrun. A highly efficient FastSLAM algorithm for generating cyclic maps of large-scale environments from raw laser range measurements. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, 2003.
- [159] M. Montemerlo, N. Roy, and S. Thrun. Perspectives on standardization in mobile robot programming: The Carnegie Mellon navigation (CARMEN) toolkit. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, 2003. Software package for download at www.cs.cmu.edu/~carmen.
- [160] D. Hähnel, W. Burgard, B. Wegbreit, and S. Thrun. Towards lazy data association in SLAM. In *Proceedings of the 11th International Symposium of Robotics Research (ISRR'03)*, Sienna, Italy, 2003. Springer.
- [161] S. Thrun and Y. Liu. Multi-robot SLAM with sparse extended information filters. In *Proceedings of the 11th International Symposium of Robotics Research (ISRR'03)*, Sienna, Italy, 2003. Springer.
- [162] M. Rosencrantz, G. Gordon, and S. Thrun. Decentralized sensor fusion with distributed particle filters. In *Proceedings of the Conference on Uncertainty in AI (UAI)*, Acapulco, Mexico, 2003.
- [163] J. Pineau, G. Gordon, and S. Thrun. Policy-contingent abstraction for robust robot control. In *Proceedings of the Conference on Uncertainty in AI (UAI)*, Acapulco, Mexico, 2003.
- [164] D. Hähnel, S. Thrun, and W. Burgard. An extension of the ICP algorithm for modeling nonrigid objects with mobile robots. In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence (IJCAI)*, Acapulco, Mexico, 2003. IJCAI.
- [165] J. Pineau, G. Gordon, and S. Thrun. Point-based value iteration: An anytime algorithm for POMDPs. In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence (IJCAI)*, Acapulco, Mexico, 2003. IJCAI.
- [166] V. Verma, R. Simmons, and S. Thrun. Variable resolution particle filter. In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence (IJCAI)*, Acapulco, Mexico, 2003. IJCAI.
- [167] M. Montemerlo, S. Thrun, D. Koller, and B. Wegbreit. FastSLAM 2.0: An improved particle filtering algorithm for simultaneous localization and mapping that provably converges. In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence (IJCAI)*, Acapulco, Mexico, 2003. IJCAI.

- [168] M. Berna, B. Lisien, B. Sellner, G. Gordon, F. Pfenning, and S. Thrun. A learning algorithm for localizing people based on wireless signal strength that uses labeled and unlabeled data. In *Proceedings of the Sixteenth International Joint Conference on Artificial Intelligence (IJCAI)*, Acapulco, Mexico, 2003. IJCAI.
- [169] S. Thrun, M. Diel, and D. Hähnel. Scan alignment and 3d surface modeling with a helicopter platform. In *Proceedings of the International Conference on Field and Service Robotics*, Lake Yamanaka, Japan, 2003.
- [170] C. Baker, Z. Omohundro, S. Thayer, W. Whittaker, M. Montemerlo, and S. Thrun. A case study in robotic mapping of abandoned mines. In *Proceedings of the International Conference on Field and Service Robotics*, Lake Yamanaka, Japan, 2003.
- [171] N. Roy, G. Gordon, and S. Thrun. Planning under uncertainty for reliable health care robotics. In *Proceedings of the International Conference on Field and Service Robotics*, Lake Yamanaka, Japan, 2003.
- [172] E. Nettleton, S. Thrun, and H. Durrant-Whyte. Decentralised slam with low-bandwidth communication for teams of airborne vehicles. In *Proceedings of the International Conference on Field and Service Robotics*, Lake Yamanaka, Japan, 2003.
- [173] C.-C. Wang, C. Thorpe, and S. Thrun. Online simultaneous localization and mapping with detection and tracking of moving objects: Theory and results from a ground vehicle in crowded urban areas. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [174] J. Nieto, J. Guivant, E. Nebot, and S. Thrun. Real time data association for FastSLAM. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [175] A. Morris, R. Donamukkala, A. Kapuria, A. Steinfeld, J. Matthews, J. Dunbar-Jacobs, and S. Thrun. A robotic walker that provides guidance. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [176] Y. Liu and S. Thrun. Results for outdoor-SLAM using sparse extended information filters. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [177] M. Montemerlo and S. Thrun. Simultaneous localization and mapping with unknown data association using FastSLAM. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [178] S. Thrun, D. Hähnel, D. Ferguson, M. Montemerlo, R. Triebel, W. Burgard, C. Baker, Z. Omohundro, S. Thayer, and W. Whittaker. A system for volumetric robotic mapping of abandoned mines. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.

- [179] M. Bennewitz, W. Burgard, and S. Thrun. Adapting navigation strategies using motion patterns of people. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [180] D. Hähnel, R. Triebel, W. Burgard, and S. Thrun. Map building with mobile robots in dynamic environments. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 2003.
- [181] M. Rosencrantz, G. Gordon, and S. Thrun. Locating moving entities in dynamic indoor environments with teams of mobile robots. In *Proceedings of Autonomous Agents and Multi-Agent Systems*, Melbourne, Australia, 2003.
- [182] J. Matthews, S. Engberg, M. Montemerlo, J. Pineau, N. Roy, J. Rogers, S. Thrun, S. Handler, T. Starrett, D. Ting, and R. Travis. The nursebot project: Results of preliminary field studies during development of a personal robotic assistant for older adults. In *Proceedings of the Greater Pittsburgh 14th Annual Nursing Research Conference*, Pittsburgh, PA, 2002.
- [183] J. Matthews, S. Engberg, M. Montemerlo, J. Pineau, N. Roy, J. Rogers, and S. Thrun. Robotic assistance during ambulation by older adults. In *Proceedings of the Annual Conference of the American Medical Informatics Association*, San Antonio, TX, 2002.
- [184] N. Roy and S. Thrun. Motion planning through policy search. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, Lausanne, Switzerland, 2002.
- [185] R. Biswas, B. Limketkai, S. Sanner, and S. Thrun. Towards object mapping in dynamic environments with mobile robots. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, Lausanne, Switzerland, 2002.
- [186] D. Avots, E. Lim, R. Thibaux, and S. Thrun. A probabilistic technique for simultaneous localization and door state estimation with mobile robots in dynamic environments. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, Lausanne, Switzerland, 2002.
- [187] M. Bennewitz, W. Burgard, and S. Thrun. Using EM to learn motion behaviors of persons with mobile robots. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, Lausanne, Switzerland, 2002.
- [188] J. Matthews, S. Thrun, and J. Dunbar-Jacobs. Robotic assistive technology for community-residing older adults and persons with disabilities: An inter-institutional initiative for students in the health and technology fields. In E. Dagless and P. Hicks, editors, *Proceedings of the International Conference on Engineering Education (ICEE 2002)*, Manchester, UK, 2002.
- [189] D. Anguelov, R. Biswas, D. Koller, B. Limketkai, S. Sanner, and S. Thrun. Learning hierarchical object maps of non-stationary en-

- vironments with mobile robots. In *Proceedings of the 17th Annual Conference on Uncertainty in AI (UAI)*, 2002.
- [190] M. Montemerlo, J. Pineau, N. Roy, S. Thrun, and V. Verma. Experiences with a mobile robotic guide for the elderly. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Edmonton, Canada, 2002. AAAI.
- [191] M. Montemerlo, S. Thrun, D. Koller, and B. Wegbreit. FastSLAM: A factored solution to the simultaneous localization and mapping problem. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Edmonton, Canada, 2002. AAAI.
- [192] C. Martin and S. Thrun. Online acquisition of compact volumetric maps with mobile robots. In *IEEE International Conference on Robotics and Automation (ICRA)*, Washington, DC, 2002. ICRA.
- [193] M. Montemerlo, W. Whittaker, and S. Thrun. Conditional particle filters for simultaneous mobile robot localization and people-tracking. In *IEEE International Conference on Robotics and Automation (ICRA)*, Washington, DC, 2002. ICRA.
- [194] M. Bennewitz, W. Burgard, and S. Thrun. Learning motion patterns of persons for mobile service robots. In *IEEE International Conference on Robotics and Automation (ICRA)*, Washington, DC, 2002. ICRA.
- [195] S. Thrun, J. Langford, and V. Verma. Risk sensitive particle filters. In *Advances in Neural Information Processing Systems 14*. MIT Press, 2002.
- [196] E. Zalama, G. Candela, J. Gomez, and S. Thrun. Concurrent mapping and localization for mobile robots with segmented local maps. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS)*, Lausanne, Switzerland, 2001.
- [197] S. Thrun, W. Burgard, D. Chakrabarti, R. Emery, Y. Liu, and C. Martin. A real-time algorithm for acquiring multi-planar volumetric models with mobile robots. In *Proceedings of the 10th International Symposium of Robotics Research (ISRR'01)*, Lorne, Australia, 2001. Springer.
- [198] H. Durrant-Whyte, S. Majumder, S. Thrun, M. de Battista, and S. Scheduling. A Bayesian algorithm for simultaneous localization and map building. In *Proceedings of the 10th International Symposium of Robotics Research (ISRR'01)*, Lorne, Australia, 2001.
- [199] S. Thrun. Learning occupancy grids with forward models. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS'2001)*, Hawaii, 2001.
- [200] M. Bennewitz, W. Burgard, and S. Thrun. Optimizing priority schemes for decoupled path planning techniques. In *Proceedings of the Conference on Intelligent Robots and Systems (IROS'2001)*, Hawaii, 2001.

- [201] D. Margaritis, C. Faloutsos, and S. Thrun. Netcube: A scalable tool for fast data mining and compression. In *Proceedings of the 2001 International Conference on Very Large Databases*, Rome, Italy, 2001.
- [202] M. Bennewitz, W. Burgard, and S. Thrun. Constraint-based optimization of priority schemes for decoupled path planning techniques. In *Proceedings of the Joint German Austrian Conference on Artificial Intelligence*. Springer Verlag, 2001.
- [203] D. Margaritis and S. Thrun. A Bayesian multiresolution independence test for continuous variables. In *Proceedings of the 17th Annual Conference on Uncertainty in AI (UAI)*, 2001.
- [204] Y. Liu, R. Emery, D. Chakrabarti, W. Burgard, and S. Thrun. Using EM to learn 3D models with mobile robots. In *Proceedings of the International Conference on Machine Learning (ICML)*, 2001.
- [205] C. Rosenberg, M. Hebert, and S. Thrun. Color constancy using KL divergence. In *Proceedings of the International Conference on Computer Vision (ICCV)*, Vancouver, Canada, 2001.
- [206] M. Bennewitz, W. Burgard, and S. Thrun. Optimizing schedules for prioritized path planning of multi-robot systems. In *IEEE International Conference on Robotics and Automation (ICRA)*, Seoul, Korea, 2001. ICRA.
- [207] L. Lita, J. Schulte, and S. Thrun. A multi-agent system for agent coordination in uncertain environments (short paper). In *Proceedings of Agents*, Montreal, CA, 2001.
- [208] F. Dellaert, S. Seitz, S. Thrun, and C. Thorpe. Feature correspondence: A Markov chain monte carlo approach. In T.K. Leen, T. Dietterich, and B. Van Roy, editors, *Advances in Neural Information Processing Systems 13*. MIT Press, 2001.
- [209] N. Roy, J. Pineau, and S. Thrun. Spoken dialogue management using probabilistic reasoning. In *Proceedings of the 38th Annual Meeting of the Association for Computational Linguistics (ACL-2000)*, Hong Kong, 2000.
- [210] R. Simmons, D. Apfelbaum, D. Fox, R.P. Goldmann, K.Z. Haigh, D.J. Musliner, M. Pelican, and S. Thrun. Coordinated deployment of multiple heterogeneous robots. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2000.
- [211] F. Dellaert, S. Seitz, C. Thorpe, and S. Thrun. Structure from motion without correspondence. In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition*. IEEE, 2000.
- [212] S. Thrun, D. Fox, and W. Burgard. Monte carlo localization with mixture proposal distribution. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Austin, TX, 2000. AAAI.

- [213] C. Boutilier, R. Reiter, M. Soutchanski, and S. Thrun. Decision-theoretic, high-level robot programming in the situation calculus. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Austin, TX, 2000. AAAI.
- [214] R. Simmons, D. Apfelbaum, W. Burgard, M. Fox, D. an Moors, S. Thrun, and H. Younes. Coordination for multi-robot exploration and mapping. In *Proceedings of the AAAI National Conference on Artificial Intelligence*, Austin, TX, 2000. AAAI.
- [215] S. Thrun, W. Burgard, and D. Fox. A real-time algorithm for mobile robot mapping with applications to multi-robot and 3D mapping. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, San Francisco, CA, 2000. IEEE.
- [216] S. Thrun. Towards programming tools for robots that integrate probabilistic computation and learning. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, San Francisco, CA, 2000. IEEE.
- [217] W. Burgard, D. Fox, M. Moors, R. Simmons, and S. Thrun. Collaborative multi-robot exploration. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, San Francisco, CA, 2000. IEEE.
- [218] S. Thrun. Monte Carlo POMDPs. In S.A. Solla, T.K. Leen, and K.-R. Müller, editors, *Advances in Neural Information Processing Systems 12*, pages 1064–1070. MIT Press, 2000.
- [219] D. Margaritis and S. Thrun. Bayesian network induction via local neighborhoods. In S.A. Solla, T.K. Leen, and K.-R. Müller, editors, *Proceedings of Conference on Neural Information Processing Systems (NIPS-12)*. MIT Press, 1999.
- [220] N. Roy and S. Thrun. Coastal navigation with a mobile robot. In *Proceedings of Conference on Neural Information Processing Systems (NIPS)*, 1999.
- [221] D. Fox, W. Burgard, H. Kruppa, and S. Thrun. Efficient multi-robot localization based on monte carlo approximation. In *Proc. of the 9th International Symposium of Robotics Research (ISRR'99)*, 1999.
- [222] D. Fox, W. Burgard, H. Kruppa, and S. Thrun. Collaborative multi-robot localization. In *Proc. of the 23rd German Conference on Artificial Intelligence, Germany (KI'99)*, 1999.
- [223] S. Thrun, M. Bennewitz, W. Burgard, A.B. Cremers, F. Dellaert, D. Fox, D. Hähnel, G. Lakemeyer, C. Rosenberg, N. Roy, J. Schulte, D. Schulz, and W. Steiner. Experiences with two deployed interactive tour-guide robots. In *Proceedings of the International Conference on Field and Service Robotics*, Pittsburgh, PA, 1999.
- [224] S. Thrun, J. Langford, and D. Fox. Monte carlo hidden markov models: Learning non-parametric models of partially observable

- stochastic processes. In *Proceedings of the International Conference on Machine Learning*, Bled, Slovenia, 1999.
- [225] W. Burgard, D. Fox, H. Jans, C. Matenar, and S. Thrun. Sonar-based mapping of large-scale mobile robot environments using EM. In *Proceedings of the International Conference on Machine Learning*, Bled, Slovenia, 1999.
- [226] D. Fox, W. Burgard, F. Dellaert, and S. Thrun. Monte Carlo localization: Efficient position estimation for mobile robots. In *Proceedings of the National Conference on Artificial Intelligence (AAAI)*, Orlando, FL, 1999. AAAI.
- [227] F. Dellaert, W. Burgard, D. Fox, and S. Thrun. Using the condensation algorithm for robust, vision-based mobile robot localization. In *Proceedings of the IEEE International Conference on Computer Vision and Pattern Recognition*, Fort Collins, CO, 1999. IEEE.
- [228] 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 *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1999.
- [229] N. Roy and S. Thrun. Online self-calibration for mobile robots. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1999.
- [230] F. Dellaert, D. Fox, W. Burgard, and S. Thrun. Monte Carlo localization for mobile robots. 1999.
- [231] N. Roy, W. Burgard, D. Fox, and S. Thrun. Coastal navigation: Robot navigation under uncertainty in dynamic environments. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1999.
- [232] J. Schulte, C. Rosenberg, and S. Thrun. Spontaneous short-term interaction with mobile robots in public places. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1999.
- [233] F. Dellaert, C. Thorpe, and S. Thrun. Super-resolved texture tracking of planar surface patches. In *Proceedings of the IEEE International Conference on Intelligent Robots and Systems (IROS'98)*, 1998.
- [234] D. Margaritis and S. Thrun. Learning to locate an object in 3d space from a sequence of camera images. In *Proceedings of the International Conference on Machine Learning (ICML)*, 1998.
- [235] 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 *Proceedings of the AAAI Fifteenth National Conference on Artificial Intelligence*, 1998.
- [236] S. Waldherr, S. Thrun, R. Romero, and D. Margaritis. Template-based recognition of pose and motion gestures on a mobile robot.

- In *Proceedings of the AAAI Fifteenth National Conference on Artificial Intelligence*, pages 977–982, 1998.
- [237] 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 *Proceedings of the AAAI Fifteenth National Conference on Artificial Intelligence*, 1998.
- [238] D. Fox, W. Burgard, S. Thrun, and A.B. Cremers. Position estimation for mobile robots in dynamic environments. In *Proceedings of the AAAI Fifteenth National Conference on Artificial Intelligence*, 1998.
- [239] K. Nigam, A. McCallum, S. Thrun, and T. Mitchell. Learning to classify text from labeled and unlabeled documents. In *Proceedings of the AAAI Fifteenth National Conference on Artificial Intelligence*, 1998.
- [240] S. Thrun. Finding landmarks for mobile robot navigation. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1998.
- [241] S. Thrun, D. Fox, and W. Burgard. Probabilistic mapping of an environment by a mobile robot. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1998.
- [242] D. Fox, W. Burgard, and S. Thrun. A hybrid collision avoidance method for mobile robots. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1998.
- [243] H. Choset, K. Nagatani, and S. Thrun. Towards exact localization without explicit localization: The topological voronoi graph. In *Proceedings of the IEEE International Conference on Robotics and Automation (ICRA)*, 1998.
- [244] W. Burgard, D. Fox, and S. Thrun. Active mobile robot localization. In *Proceedings of the Fourteenth International Joint Conference on Artificial Intelligence (IJCAI)*, San Mateo, CA, 1997. Morgan Kaufmann.
- [245] S. Thrun and A. Bücken. Integrating grid-based and topological maps for mobile robot navigation. In *Proceedings of the AAAI Thirteenth National Conference on Artificial Intelligence*, Portland, Oregon, 1996.
- [246] A. Bücken and S. Thrun. Learning topological maps: An alternative approach. In *Proceedings of the AAAI Thirteenth National Conference on Artificial Intelligence*, Portland, Oregon, 1996. (student abstract).
- [247] S. Thrun and J. O’Sullivan. Discovering structure in multiple learning tasks: The TC algorithm. In L. Saitta, editor, *Proceedings of the 13th International Conference on Machine Learning ICML-96*, San Mateo, CA, 1996. Morgan Kaufmann.
- [248] S. Thrun. Is learning the n -th thing any easier than learning the first? In D. Touretzky and M. Mozer, editors, *Advances in Neural*

- Information Processing Systems (NIPS) 8*, pages 640–646, Cambridge, MA, 1996. MIT Press.
- [249] D. Fox, W. Burgard, and S. Thrun. Controlling synchro-drive robots with the dynamic window approach to collision avoidance. In *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS'96)*, 1996.
- [250] S. Thrun and T. Mitchell. Learning one more thing. In *Proceedings of the Fourteenth International Joint Conference on Artificial Intelligence (IJCAI)*, San Mateo, CA, 1995. Morgan Kaufmann.
- [251] S. Thrun and A. Schwartz. Finding structure in reinforcement learning. In G. Tesauro, D. Touretzky, and T. Leen, editors, *Advances in Neural Information Processing Systems (NIPS) 7*, Cambridge, MA, 1995. MIT Press.
- [252] S. Thrun. Learning to play the game of chess. In G. Tesauro, D. Touretzky, and T. Leen, editors, *Advances in Neural Information Processing Systems (NIPS) 7*, Cambridge, MA, 1995. MIT Press.
- [253] S. Thrun. Extracting rules from artificial neural networks with distributed representations. In G. Tesauro, D. Touretzky, and T. Leen, editors, *Advances in Neural Information Processing Systems (NIPS) 7*, Cambridge, MA, 1995. MIT Press.
- [254] S. Thrun. A lifelong learning perspective for mobile robot control. In *Proceedings of the IEEE/RSJ/GI Conference on Intelligent Robots and Systems*, pages 23–30, 1994. Also appeared in "Intelligent Robots and Systems," V. Graefe (ed.), 1995.
- [255] S. Thrun and T. Mitchell. Integrating inductive neural network learning and explanation-based learning. In R. Bajcsy, editor, *Proceedings of the Thirteenth International Joint Conference on Artificial Intelligence (IJCAI)*, San Mateo, CA, 1993. Morgan Kaufmann.
- [256] T. Mitchell and S. Thrun. Explanation-based learning: A comparison of symbolic and neural network approaches. In P. Utgoff, editor, *Proceedings of the Tenth International Conference on Machine Learning*, pages 197–204, San Mateo, CA, 1993. Morgan Kaufmann.
- [257] T. Mitchell and S. Thrun. Explanation-based neural network learning for robot control. In *Advances in Neural Information Processing Systems (NIPS) 5*, pages 287–294, San Mateo, CA, 1993. Morgan Kaufmann.
- [258] S. Thrun. Exploration and model building in mobile robot domains. In E. Ruspini, editor, *Proceedings of the IEEE International Conference on Neural Networks*, pages 175–180, San Francisco, CA, 1993. IEEE Neural Network Council.
- [259] S. Thrun and K. Möller. Active exploration in dynamic environments. In *Advances in Neural Information Processing Systems (NIPS) 4*, pages 531–538, San Mateo, CA, 1992. Morgan Kaufmann.

- [260] S. Thrun, K. Möller, and A. Linden. Planning with an adaptive world model. In D. Touretzky and R. Lippmann, editors, *Advances in Neural Information Processing Systems (NIPS) 3*, pages 450–456, San Mateo, CA, 1991. Morgan Kaufmann.
- [261] D. Fox, V. Heinze, K. Möller, S. Thrun, and G. Veenker. Learning by error-driven decomposition. In T. Kohonen O. Simula, editor, *Proceedings of the International Conference on Neural Networks*, Amsterdam, 1991. Elsevier.
- [262] S. Thrun, K. Möller, and A. Linden. Adaptive look-ahead planning. In J.C. Rault, editor, *Proceedings Neuro-Nimes*, Nimes, France, EC2, 1990.
- [263] K. Möller and S. Thrun. Task modularization by network modulation. In J.C. Rault, editor, *Proceedings Neuro-Nimes*, Nimes, France, EC2, 1990.

REFEREED WORKSHOP & SYMPOSIUM PAPERS

- [264] R. Frankel, O. Gudmundsson, B. Miller, T. Sullivan, S. Syed, D. Hoang, J.M. John, K.-S. Liao, P. Nahass, A. Schwab, J. Yuan, D. Stavens, C. Plagemann, C. Nass, and S. Thrun. Assisted highway lane changing with RASCL. In *Proceedings of the AAAI Spring Symposium*, Stanford, CA, 2010. AAAI.
- [265] A. Saxena, A. Ng, S. Srivastava, C. Theobalt, and S. Thrun. Rapid interactive 3d reconstruction from a single image. In *Proceedings of the Vision, Modeling, and Visualization Workshop*, Braunschweig, Germany, 2009.
- [266] M. Kim, C. Theobalt, J. Diebel, J. Kosecka, B. Micusik, and S. Thrun. Multi-view image and tof sensor fusion for dense 3d reconstruction. In *Proceedings of the 2009 IEEE Workshop on 3-D Digital Imaging and Modeling*, 2009.
- [267] D. Chan, H. Buisman, C. Theobalt, and S. Thrun. A noise-aware filter for real-time depth upsampling. In A. Cavallaro and H. Aghajan, editors, *Proceedings of the ECCV Workshop on Multi-camera and Multi-modal Sensor Fusion Algorithms and Applications*, Marseille, France, 2008. ECCV.
- [268] M. Montemerlo, J. Becker, S. Bhat, H. Dahlkamp, D. Dolgov, S. Ettinger, D. Haehnel, T. Hilden, G. Hoffmann, B. Huhnke, D. Johnston, S. Klumpp, D. Langer, A. Levandowski, J. Levinson, J. Marcil, D. Orenstein, J. Paefgen, I. Penny, A. Petrovskaya, M. Pflueger, G. Stanek, D. Stavens, A. Vogt, and S. Thrun. Junior, the stanford racing team’s robot in the 2007 darpa urban challenge. In *Proceedings of the Symposium on Automation, Assistance and Embedded Real Time Platforms for Transportation (AAET)*, Braunschweig, Germany, 2008.

- [269] Y.M. Kim, D. Chan, C. Theobalt, and S. Thrun. Design and calibration of a multi-view TOF sensor fusion system. In *Proceedings of the CVPR Workshop on Time of Flight Camera based Computer Vision*, Anchorage, Alaska, 2008.
- [270] S. Schuon, C. Theobalt, J. Davis, and S. Thrun. High-quality scanning using time-of-flight depth superresolution. In *Proceedings of the CVPR Workshop on Time of Flight Camera based Computer Vision*, Anchorage, Alaska, 2008.
- [271] R. Biswas and S. Thrun. Recognizing activities with multiple cues. In *Proceedings of the 2nd workshop on Human Motion Understanding, Modeling, Capture and Animation*, Berlin, Germany, 2007. Springer.
- [272] B. Gerkey, S. Thrun, and G. Gordon. Parallel stochastic hill-climbing with small teams. In L. Parker, F. Schneider, and A. Schultz, editors, *Proceedings of the 3rd International Workshop on Multi-Robot Systems*, Amsterdam, 2004. NRL, Kluwer Publisher.
- [273] M. Montemerlo and S. Thrun. Large-scale robotic 3-d mapping of urban structures. In *Proceedings of the International Symposium on Experimental Robotics (ISER)*, Singapore, 2004. Springer Tracts in Advanced Robotics (STAR).
- [274] S. Thrun, D. Koller, Z. Ghahramani, H. Durrant-Whyte, and A.Y. Ng. Simultaneous mapping and localization with sparse extended information filters. In J.-D. Boissonnat, J. Burdick, K. Goldberg, and S. Hutchinson, editors, *Proceedings of the Fifth International Workshop on Algorithmic Foundations of Robotics*, Nice, France, 2002.
- [275] J. Pineau, N. Roy, M. Montemerlo, S. Thrun, and M. Pollack. Probabilistic control of human robot interaction: Experiences with a robotic assistant for nursing homes. In G. Giralt and R. Chatila, editors, *Proceedings of the IARP-IEEE/RAS Workshop on Robot Dependability*, 2002.
- [276] M.E. Pollack, L. Brown, D. Colbry, C. Orosz, B. Peintner, S. Ramakrishnan, S. Engberg, J.T. Matthews, J. Dunbar-Jacobs, C. McCarthy, S. Thrun, M. Montemerlo, J. Pineau, and N. Roy. Pearl: A mobile robotic assistant to the elderly. In *AAAI Workshop notes*, Menlo Park, CA, 2002. AAAI.
- [277] J. Pineau and S. Thrun. High-level robot behavior control using pomdps. In *AAAI Workshop notes*, Menlo Park, CA, 2002. AAAI.
- [278] S. Thrun. A programming language extension for probabilistic robot programming. In *Workshop notes of the IJCAI Workshop on Uncertainty in Robotics (RUR)*, Seattle, WA, 2001. IJCAI, Inc.
- [279] C. Boutilier, R. Reiter, M. Soutchanski, and S. Thrun. A decision-theoretic model of high-level agent programming in the situation calculus: Preliminary notes. In *Proceedings of the AIPS workshop on Decision-Theoretic Planning*, Breckenridge, CO, 2000.

- [280] N. Roy, G. Baltus, D. Fox, F. Gemperle, J. Goetz, T. Hirsch, D. Margaritis, M. Montemerlo, J. Pineau, J. Schulte, and S. Thrun. Towards personal service robots for the elderly. In *Proceedings of the Workshop on Interactive Robotics and Entertainment (WIRE)*, Pittsburgh, PA, 2000. Carnegie Mellon University.
- [281] N. Roy, W. Burgard, and S. Thrun. Coastal navigation: Robot motion with uncertainty. In *AAAI Fall Symposium Workshop Notes*. AAAI, 1998.
- [282] R. Romero, S. Waldherr, and S. Thrun. A neural-network based approach for recognition of pose and motion gestures on a mobile robot. In *Proceedings of the IEEE Vth Brazilian Symposium on Neural Networks*, 1998.
- [283] W. Burgard, A.B. Cremers, D. Fox, G. Lakemeyer, D. Hähnel, D. Schulz, W. Steiner, and S. Thrun. The museum tour-guide robot RHINO. In *Proceedings of the 14. Fachgespräch Autonome Mobile Systeme (AMS '98)*. Springer Verlag, 1998.
- [284] F. Dellaert, S. Thrun, and C. Thorpe. Jacobian images of super-resolved texture maps for model-based motion estimation and tracking. In *Proceedings of the IEEE Workshop on Applications of Computer Vision (WACV-98)*, 1998.
- [285] J. Schulte and S. Thrun. Reinforcement learning for intelligent building control. In *Proceedings of the Conference on Automated Learning and Discovery, Workshop on Machine Learning and Reinforcement Learning for Manufacturing*, 1998.
- [286] S. Thrun and N. Roy. Integrating learning for robust development. In *Proceedings of the 1998 AAAI Spring Symposium*, 1998.
- [287] R. Simmons and S. Thrun. Languages and tools for task-level robotics integration. In *Proceedings of the 1998 AAAI Spring Symposium*, 1998.
- [288] W. Burgard, A.B. Cremers, D. Fox, G. Lakemeyer, D. Hähnel, D. Schulz, W. Steiner, and S. Thrun. Real robots for the real world—the RHINO museum tour-guide project. In *Proceedings of the 1998 AAAI Spring Symposium*, 1998.
- [289] C. Faloutsos, G. Gibson, T. Mitchell, A.W. Moore, and S. Thrun. Data mining at CALD-CMU: Tools, experiences and research directions. In *Proceedings of the AFCEA International's First Federal Data Mining Symposium*, Washington, D.C, 1997.
- [290] S. Thrun. Discovering landmarks and learning models for mobile robot navigation. In *Proceedings of AAAI Fall Symposium*, 1997.
- [291] W. Burgard, D. Fox, and S. Thrun. Active mobile robot localization by entropy minimization. In *Proceedings of the 2nd Euromicro Workshop on Advanced Mobile Robots*. IEEE/CS, 1997.
- [292] T. Mitchell, J. O'Sullivan, and S. Thrun. Explanation-based learning for mobile robot perception. In *Proceedings of the Robot Learning Workshop at the Eleventh Conference in Machine Learning*, 1994.

- [293] S. Thrun and A. Schwartz. Issues in using function approximation for reinforcement learning. In M. Mozer, P. Smolensky, D. Touretzky, J. Elman, and A. Weigend, editors, *Proceedings of the 1993 Connectionist Models Summer School*, pages 255–263, Hillsdale, NJ, 1993. Erlbaum Associates.
- [294] S. Thrun and A. Linden. Inversion in time. In L.B. Almeida and C. Wellekens, editors, *Proceedings of the EURASIP Workshop on Neural Networks*. Springer Scientific Publishers, 1990.

UNREFEREED CONFERENCE PAPERS

- [295] S. Thrun. Particle filters in robotics. In *Proceedings of the 17th Annual Conference on Uncertainty in AI (UAI)*, 2002.
- [296] 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 23rd German Conference on Artificial Intelligence, Germany (KI'99)*. Springer Verlag, 1999.
- [297] R. Simmons, S. Thrun, G. Armstrong, R. Goodwin, K. Haigh, S. Koenig, S. Mahamud, D. Nikovski, and J. O'Sullivan. Amelia (extended abstract). In *Proceedings of the AAAI Thirteenth National Conference on Artificial Intelligence*, Portland, Oregon, 1996.
- [298] S. Thrun. The role of transfer in learning. In *Proceedings of the Eighteenth Annual Conference of the Cognitive Science Society*, La Jolla, CA, 1996.
- [299] A.B. Cremers, S. Thrun, and W. Burgard. From AI technology research to applications. In K. Duncan and K. Kruger, editors, *Proceedings of the IFIP Congress-Volume 3*, Amsterdam, Holland, 1994. Elsevier Science B.V. Publishers.
- [300] S. Thrun, K. Möller, and A. Linden. Adaptive look-ahead planning. In G. Dorffner, editor, *Proceedings KONNAI/OEGAI*. Springer Scientific Publishers, 1990.

UNREFEREED WORKSHOP & SYMPOSIUM PAPERS & ABSTRACTS

- [301] D. Dolgov, S. Thrun, M. Montemerlo, and J. Diebel. Practical search techniques in path planning for autonomous driving. In D. Furcy, S. Koenig, W. Ruml, and R. Zhou, editors, *Proceedings of the The First International Symposium on Search Techniques in Artificial Intelligence and Robotics*, AAAI, Chicago, IL, 2008.

- [302] D. Anguelov, D. Koller, P. Srinivasan, S. Thrun, H.-C. Pang, and J. Davis. The correlated correspondence algorithm for unsupervised registration of nonrigid surfaces. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 2004. NIPS Foundation. Extended abstract.
- [303] W. Burgard, D. Hähnel, R. Triebel, and S. Thrun. Mapping with mobile robots in dynamic environments. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 2003. NIPS Foundation. Extended abstract.
- [304] S. Thrun, D. Hähnel, and W. Burgard. Modeling nonrigid objects from range data. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 2003. NIPS Foundation. Extended abstract.
- [305] J. Pineau, M. Montemerlo, M. Pollack, N. Roy, and S. Thrun. Towards robotic assistants in nursing homes: challenges and results. In T. Fong and I. Nourbakhsh, editors, *Workshop notes (WS8: Workshop on Robot as Partner: An Exploration of Social Robots)*, *IEEE International Conference on Robots and Systems*, Lausanne, Switzerland, 2002. IEEE.
- [306] S. Thrun, Y. Liu, R. Emery, and D. Chakrabarti. Learning 3D environment models with mobile robots. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 2001. NIPS Foundation. Extended abstract.
- [307] S. Thrun. Particle filters for mobile robot navigation. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 2000. NIPS Foundation. Extended abstract.
- [308] S. Thrun. Monte carlo hidden markov models. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 1999. NIPS Foundation. Extended abstract.
- [309] 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*, 1999.
- [310] S. Thrun, D. Fox, and W. Burgard. Probabilistic state estimation in robotics. In *Proceedings of the Workshop on Self-Organization of Adaptive Behavior*, Ilmenau, Germany, 1997. VDI-Verlag.
- [311] S. Thrun. Discovering landmarks for mobile robot navigation. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 1997. NIPS Foundation. Extended abstract.
- [312] S. Thrun. The museum tourguide project: Experiences with a deployed service robot. In *Proceedings of the IEEE International Symposium on Computational Intelligence in Robotics and Automation (CIRA)*, Monterey, CA, 1997.
- [313] S. Thrun. Discovering hierarchies in families of supervised learning tasks. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 1996. NIPS Foundation. Extended abstract.

- [314] S. Thrun and J. O’Sullivan. Learning more from less data: Experiments in lifelong learning. In *Seminar Digest*. IEE, 1996.
- [315] S. Thrun. Neural network learning in the domain of chess. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 1994. NIPS Foundation. Extended abstract.
- [316] S. Thrun. Explanation-based rule extraction from artificial neural networks. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 1993. NIPS Foundation. Extended abstract.
- [317] S. Thrun. The role of exploration in autonomous robot navigation. In *Proceedings of the Snowbird Workshop "Machines That Learn"*, Snowbird, UT, 1992. NIPS Foundation. Extended abstract.

UNREFEREED TECHNICAL REPORTS

- [318] M. Likhachev, D. Ferguson, G. Gordon, A. Stentz, , and S. Thrun. Anytime dynamic a*: The proofs. Technical Report CMU-RI-TR-05-12, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, 2005.
- [319] D. Ferguson, A. Stentz, and S. Thrun. Planning with pinch points. Technical Report CMU-RI-TR-04-06, Robotics Institute, Carnegie Mellon University, Pittsburgh, PA, January 2004.
- [320] D. Anguelov, D. Koller, P. Srinivasan, S. Thrun, H.-C. Pang, and J. Davis. The correlated correspondence algorithm for unsupervised registration of nonrigid surfaces. Technical Report TR-SAIL-2004-100, Stanford AI Lab, Stanford. CA, March 2004.
- [321] J. Glover, D. Holstius, M. Manojlovich, K. Montgomery, A. Powers, J. Wu, S. Kiesler, J. Matthews, and S. Thrun. A robotically-augmented walker for older adults. Technical Report CMU-CS-03-170, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2003.
- [322] M. Likhachev, G. Gordon, and S. Thrun. ARA*: Formal analysis. Technical Report CMU-CS-03-148, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2003.
- [323] M. Montemerlo, D. Hähnel, D. Ferguson, R. Triebel, W. Burgard, S. Thayer, W. Whittaker, and S. Thrun. A system for three-dimensional robotic mapping of underground mines. Technical Report CMU-CS-02-185, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2002.
- [324] J. Pineau and S. Thrun. An integrated approach to hierarchy and abstraction for POMDPs. Technical Report CMU-RI-02-21, Carnegie Mellon University, Robotics Institute, Pittsburgh, PA, 2002.

- [325] S. Thrun, D. Koller, Z. Ghahramani, H. Durrant-Whyte, and A.Y. Ng. Simultaneous mapping and localization with sparse extended information filters: theory and initial results. Technical Report CMU-CS-02-112, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2002.
- [326] S. Thrun. Robotic mapping: A survey. Technical Report CMU-CS-02-111, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2002.
- [327] D. Margaritis, C. Faloutsos, and S. Thrun. Netcube: A scalable tool for fast data mining and compression. Technical Report CMU-CS-01-133, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2001.
- [328] S. Thrun. An online mapping algorithm for teams of mobile robots. Technical Report CMU-CS-00-167, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2000.
- [329] S. Thrun. Probabilistic algorithms in robotics. Technical Report CMU-CS-00-126, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2000.
- [330] S. Thrun, D. Fox, W. Burgard, and F. Dellaert. Robust monte carlo localization for mobile robots. Technical Report CMU-CS-00-125, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 2000.
- [331] F. Dellaert, C. Thorpe, and S. Thrun. Mosaicing a large number of widely dispersed, noisy, and distorted images: A Bayesian approach. Technical Report CMU-RI-TR-99-34, Carnegie Mellon University, Pittsburgh, PA, 1999.
- [332] D. Margaritis and S. Thrun. Bayesian network induction via local neighborhoods. Technical Report CMU-CS-99-134, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1999.
- [333] D. Fox, W. Burgard, and S. Thrun. Markov localization for reliable robot navigation and people detection. In *Modeling and Planning for Sensor-Based Intelligent Robot Systems*, Lecture Notes in Computer Science. Springer Verlag, 1999. To appear.
- [334] S. Thrun and J. Langford. Monte carlo hidden markov models. Technical Report CMU-CS-98-179, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1998.
- [335] S. Thrun. A framework for programming embedded systems: Initial design and results. Technical Report CMU-CS-98-142, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1998.
- [336] S. Thrun, C. Faloutsos, T. Mitchell, and L. Wasserman. Automated learning and discovery: State-of-the-art and research topics in a rapidly growing field. Technical Report CMU-CALD-98-100, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1998.

- [337] 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. Technical Report CMU-CS-98-139, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1998.
- [338] K. Nigam, A. McCallum, S. Thrun, and T. Mitchell. Using em to classify text from labeled and unlabeled documents. Technical Report CMU-CS-98-120, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1998.
- [339] S. Thrun, D. Fox, and W. Burgard. A probabilistic approach for concurrent map acquisition and localization for mobile robots. Technical Report CMU-CS-97-183, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1997.
- [340] S. Thrun. A Bayesian approach to landmark discovery and active perception for mobile robot navigation. Technical Report CMU-CS-96-122, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1996.
- [341] S. Thrun and A. Bücken. Learning maps for indoor mobile robot navigation. Technical Report CMU-CS-96-121, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1996.
- [342] D. Fox, W. Burgard, and S. Thrun. The dynamic window approach to collision avoidance. Technical Report IAI-TR-95-13, University of Bonn, Institut für Informatik III, 1995.
- [343] S. Thrun and J. O’Sullivan. Clustering learning tasks and the selective cross-task transfer of knowledge. Technical Report CMU-CS-95-209, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1995.
- [344] S. Thrun. Lifelong learning: A case study. Technical Report CMU-CS-95-208, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1995.
- [345] S. Thrun and T. Mitchell. Learning one more thing. Technical Report CMU-CS-94-184, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1994.
- [346] S. Thrun. Lifelong robot learning. Technical Report IAI-TR-93-7, University of Bonn, Institut für Informatik III, 1993.
- [347] S. Thrun. Extracting provably correct rules from artificial neural networks. Technical Report IAI-TR-93-5, University of Bonn, Institut für Informatik III, 1993.
- [348] S. Thrun. Efficient exploration in reinforcement learning. Technical Report CMU-CS-92-102, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1992.
- [349] S. Thrun, J. Bala, E. Bloedorn, I. Bratko, B. Cestnik, J. Cheng, K. De Jong, S. Dzeroski, R. Hamann, K. Kaufman, S. Keller, I. Kononenko, J. Kreuziger, R.S. Michalski, T. Mitchell, P. Pachowicz, B. Roger, H. Vafaie, W. Van de Velde, W. Wenzel,

- J. Wnek, and J. Zhang. The MONK's problems: A performance comparison of different learning algorithms. Technical Report CMU-CS-91-197, Carnegie Mellon University, Computer Science Department, Pittsburgh, PA, 1991.
- [350] S. Thrun and K. Möller. On planning and exploration in non-discrete environments. Technical Report Arbeitspapiere Nr. 528, National Research Center For Information Technology (GMD), Sankt Augustin, Germany, 1991.
- [351] S. Thrun and F. Śmieja. A general feed-forward algorithm for gradient descent in connectionist networks. Technical Report Arbeitspapiere Nr. 483, National Research Center For Information Technology (GMD), Sankt Augustin, Germany, 1990.

THESES

- [352] S. Thrun. *Explanation-Based Neural Network Learning: A Lifelong Learning Approach*. PhD thesis, University of Bonn, Bonn, Germany, July 1995.
- [353] Sebastian Thrun. Backpropagation and neurocontrol. Master's thesis, University of Bonn, 1992. In German.

SUBMISSIONS