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## References

1. Proc. 7th int. sym. experimental robotics. In *Proc. 7th Int. Sym. Experimental Robotics*, Honolulu, Dec. 2000.
2. *Proc. 10th Int. Sym. Robot. Res.*, Lorne, Nov. 2001.
3. *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.*, Maui, Nov. 2001.
4. *Proc. IEEE Int. Conf. Robot. Automat.*, New Orleans, Apr. 2004.
5. *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.*, Sendai, Sep. 2004.
6. J. Andrade-Cetto. *Environment Learning for Indoor Mobile Robots*. PhD thesis, UPC, Barcelona, Apr. 2003.
7. J. Andrade-Cetto and A. Sanfeliu. Concurrent map building and localization on indoor dynamic environments. *Int. J. Pattern Recogn.*, 16(3):361–374, May 2002.
8. J. Andrade-Cetto and A. Sanfeliu. Concurrent map building and localization with landmark validation. In *Proc. 16th IAPR Int. Conf. Pattern Recogn.*, volume 2, pages 693–696, Quebec, Aug. 2002. IEEE Comp. Soc.
9. J. Andrade-Cetto and A. Sanfeliu. Temporal landmark validation in CML. In *Proc. IEEE Int. Conf. Robot. Automat.*, pages 1576–1581, Taipei, Sep. 2003.
10. J. Andrade-Cetto and A. Sanfeliu. The effects of partial observability in SLAM. In *Proc. IEEE Int. Conf. Robot. Automat.* [4], pages 397–402.
11. J. Andrade-Cetto and A. Sanfeliu. The effects of partial observability when building fully correlated maps. *IEEE Trans. Robot.*, 21(4):771–777, Aug. 2005.
12. J. Andrade-Cetto, T. Vidal-Calleja, , and A. Sanfeliu. Multirobot C-SLAM: Simultaneous localization, control, and mapping. In *Proc. IEEE ICRA05 Workshop Network Robot Syst.*, Barcelona, Apr. 2005.
13. J. Andrade-Cetto, T. Vidal-Calleja, and A. Sanfeliu. Stochastic state estimation for simultaneous localization and map building in mobile robotics. In V. Kordic, A. Lazinica, and M. Merdan, editors, *Cutting Edge Robotics*, chapter III.3, pages 223–242. Advanced Robotic Systems Press, 2005.
14. J. Andrade-Cetto, T. Vidal-Calleja, and A. Sanfeliu. Unscented transformation of vehicle states in SLAM. In *Proc. IEEE Int. Conf. Robot. Automat.*, pages 324–329, Barcelona, Apr. 2005.
15. G. C. Anousaki and K. J. Kyriakopoulos. Simultaneous localization and map building for mobile robot navigation. *IEEE Robot. Autom. Mag.*, 6(3):42–53, Sep. 1999.

16. N. Ayache and O. Faugeras. Maintaining representations of the environment of a mobile robot. *IEEE Trans. Pattern Anal. Machine Intell.*, 5(6):804–819, Dec. 1989.
17. Y. Bar-Shalom and T. H. Fortmann. *Tracking and Data Association*, volume 179 of *Mathematics in Science and Engineering*. Academic Press, Boston, 1988.
18. Y. Bar-Shalom, X. Rong Li, and T. Kirubarajan. *Estimation with Applications to Tracking and Navigation*. John Wiley & Sons, New York, 2001.
19. R. Brockett. Asymptotic stability and feedback stabilization. In *Differential Geometric Control Theory*, pages 181–191. Birkhauser, 1983.
20. D. Burschka and G. Hager. Principles and practice of real-time visual tracking for navigation and mapping. In *Proc. Int. Workshop on Robot Sensing*, pages 1–8, Graz, May 2004.
21. J. A. Castellanos, J. M. M. Montiel, J. Neira, and J. D. Tardós. The SPMaP: A probabilistic framework for simultaneous localization and map building. *IEEE Trans. Robot. Automat.*, 15(5):948–952, Oct. 1999.
22. H. Choset and K. Nagatani. Topological simultaneous localization and mapping (SLAM): Toward exact localization without explicit localization. *IEEE Trans. Robot. Automat.*, 17(2):125–137, Apr. 2001.
23. P. Coelho and U. Nunes. Path-following control of mobile robots in the presence of uncertainties. *IEEE Trans. Robot.*, (2):252–261, Apr. 2005.
24. A. J. Davison and N. Kita. Sequential localisation and map-building for real-time computer vision and robotics. *Robot. Auton. Syst.*, 36:171–183, 2001.
25. A. J. Davison and D. W. Murray. Simultaneous localisation and map-building using active vision. *IEEE Trans. Pattern Anal. Machine Intell.*, 24(7):865–880, Jul. 2002.
26. M. Deans and M. Hebert. Experimental comparison of techniques for localization and mapping using a bearing-only sensor. In *Proc. 7th Int. Sym. Experimental Robotics [1]*, pages 395–404.
27. R. A. DeCarlo. *Linear Systems. A State Variable Approach with Numerical Implementation*. Prentice Hall, Englewood Cliffs, 1989.
28. K. Demirli and I. B. Türkşen. Mobile robot navigation with generalized modulus type fuzzy reasoning. In *Proc. IEEE Int. Conf. Syst., Man, Cybern.*, pages 3724–3729, Vancouver, Oct. 1995.
29. E. D. Dickmanns. Recursive state estimation. Lecture Notes. Spring 1996. Caltech., Apr. 1996.
30. G. Dissanayake, H. Durrant-Whyte, and T. Bailey. A computationally efficient solution to the simultaneous localisation and map building (SLAM) problem. In *Proc. IEEE Int. Conf. Robot. Automat.*, pages 1009–1014, San Francisco, Apr. 2000.
31. M. W. M. G. Dissanayake, P. Newman, S. Clark, H. F. Durrant-Whyte, and M. Csorba. A solution to the simultaneous localization and map building (SLAM) problem. *IEEE Trans. Robot. Automat.*, 17(3):229–241, Jun. 2001.
32. E. R. Dowski. An information theory approach to incoherent information processing. In *Proc. 5th Topical Meeting on Signal Recovery and Synthesis*, OSA Technical Digest, pages 106–108, Mar. 1995.
33. C. Drocourt, L. Delahoche, C. Pegard, and A. Clerentin. Mobile robot localization based on omnidirectional stereoscopic vision perception system. In *Proc. IEEE Int. Conf. Robot. Automat.*, volume 2, pages 1329–1334, Detroit, May 1999.

34. T. Duckett and U. Nehmzow. Mobile robot self-localization and measurement of performance in middle-scale environments. *Robot. Auton. Syst.*, 24(1-2):57–69, Aug. 1998.
35. R. O. Duda, P. E. Hart, and D. G. Stork. *Pattern Classification*. Wiley & Sons, New York, 2nd. edition, 2001.
36. H. Durrant-Whyte, S. Majumder, M. de Battista, and S. Scheduling. A Bayesian algorithm for simultaneous localisation and map building. In *Proc. 10th Int. Sym. Robot. Res.* [2].
37. M. Fischler and R. Bolles. Random sample consensus: A paradigm for model fitting with applications to image analysis and automated cartography. *Comm. ACM*, 24:381–385, 1981.
38. D. Fox, W. Burgard, and S. Thrun. Markov localization for mobile robots in dynamic environments. *J. Artif. Intell. Res.*, 30:391–427, Nov. 1999.
39. K. Fukunaga. *Introduction to Statistical Pattern Recognition*. Academic Press, San Diego, 2nd edition, 1990.
40. K. Furuta and A. Sano. *State Variable Methods in Automatic Control*. John Wiley & Sons, Chichester, 1988.
41. P. W. Gibbens, G. M. W. M. Dissanayake, and H. F. Durrant-Whyte. A closed form solution to the single degree of freedom simultaneous localisation and map building (SLAM) problem. In *Proc. IEEE Int. Conf. Decision Control*, pages 408–415, Sydney, Dec. 2000.
42. R. C. Gonzalez and R. E. Woods. *Digital Image Processing*. Addison Wesley, Reading, 1993.
43. J. Guivant and M. Nebot. Navigation in large outdoor unstructured environments. In *Proc. 10th Int. Sym. Robot. Res.* [2].
44. J. E. Guivant and E. M. Nieto. Optimization of simultaneous localization and map-building algorithm for real-time implementation. *IEEE Trans. Robot. Automat.*, 17(3):242–257, Jun. 2001.
45. J. E. Guivant and E. M. Nieto. Solving computational and memory requirements of feature-based simultaneous localization and mapping algorithms. *IEEE Trans. Robot. Automat.*, 19(4):749–755, Aug. 2003.
46. R. Hartley and A. Zisserman. *Multiple View Geometry in Computer Vision*. Cambridge University Press, Cambridge, 2000.
47. M. Hashima, F. Hasegawa, S. Kanda, T. Maruyama, and T. Uchiyama. Localization and obstacle detection for a robot for carrying food trays. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.*, volume 2, pages 345–351, Grenoble, 1997.
48. S. Julier, J. Uhlmann, and H. F. Durrant-Whyte. A new method for the non-linear transformation of means and covariances in filters and estimators. *IEEE Trans. Automat. Contr.*, 45(3):477–482, Mar. 2000.
49. S. J. Julier. A sparse weight Kalman filter approach to simultaneous localisation and map building. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.* [3], pages 1251–1256.
50. S. J. Julier. The spherical simplex unscented transformation. In *Proc. American Control Conf.*, Denver, Jun. 2003.
51. S. J. Julier. The stability of covariance inflation methods for SLAM. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.*, pages 2749–2754, Las Vegas, Oct. 2003.

52. S. J. Julier and J. K. Uhlmann. A new extension of the Kalman filter to nonlinear systems. In I. Kadar, editor, *Proc. 11th SPIE Int. Sym. Aerospace/Defense Sensing, Simulation, Controls*, pages 182–193, Orlando, Apr. 1997. SPIE.
53. S. J. Julier and J. K. Uhlmann. A counter example to the theory of simultaneous localization and map building. In *Proc. IEEE Int. Conf. Robot. Automat.*, pages 4238–4243, Seoul, May 2001.
54. S. J. Julier and J. K. Uhlmann. Simultaneous localisation and map building using split covariance intersection. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.* [3], pages 1257–1262.
55. S. J. Julier and J. K. Uhlmann. Unscented filtering and nonlinear estimation. *Proc. IEEE*, 92(3):401–422, Mar. 2004.
56. T. Kailath. *Linear Systems*. Information and System Sciences Series. Prentice Hall, Englewood Cliffs, 1980.
57. R. E. Kalman. A new approach to linear filtering and prediction problems. *J. Basic Eng.-T. ASME*, pages 35–45, Mar. 1960.
58. R. E. Kalman and R. S. Bucy. New results in linear filtering and prediction theory. *J. Basic Eng.-T. ASME*, pages 95–108, Mar. 1961.
59. J. Kim and S. Sukkarieh. Improving the real-time efficiency of inertial SLAM and understanding its observability. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.* [5], pages 21–26.
60. A. Kosaka and A. C. Kak. Fast vision-guided mobile robot navigation using model-based reasoning and prediction of uncertainties. *Comput. Vis. Image Und.*, 56(3):271–329, Nov. 1992.
61. Y. D. Kwon and J. S. Lee. A stochastic map building method for mobile robot using 2-d laser range finder. *Auton. Robot.*, 7(2):187–200, 1999.
62. D. Lee and M. Recce. Quantitative evaluation of the exploration strategies of a mobile robot. *Int. J. Robot. Res.*, 16(4):413–447, Aug. 1997.
63. J. J. Leonard, H. F. Durrant-Whyte, and I. J. Cox. Dynamic map building for an autonomous mobile robot. *Int. J. Robot. Res.*, 11(4):286–292, 1992.
64. J. J. Leonard, P. M. Newman, R. J. Rikoski, J. Neira, and J. D. Tardós. Towards robust data association and feature modeling for concurrent mapping and localization. In *Proc. 10th Int. Sym. Robot. Res.* [2].
65. J. J. Leonard and R. Rikoski. Incorporation of delayed decision making into stochastic mapping. In *Proc. 7th Int. Sym. Experimental Robotics* [1].
66. A. Mallet and S. Lacroix. Toward real-time 2d localization in outdoor environments. In *Proc. IEEE Int. Conf. Robot. Automat.*, volume 4, pages 2827–2832, Leuven, May 1998.
67. R. Mandelbaum, G. Kamberova, and M. Mintz. Statistical decision theory for mobile robotics: Theory and application. In *Proc. IEEE Int. Conf. Multisensor Fusion Integration Intell. Syst.*, pages 17–24, Washington, Dec. 1996.
68. P. S. Maybeck. *Stochastic Models, Estimation, and Control*, volume 1. Academic Press, New York, 1979.
69. E. Nebot, J. Guivant, and J. Nieto. ACFR, experimental outdoor dataset, 2002.
70. J. Neira and J. D. Tardós. Data association in stochastic mapping using the joint compatibility test. *IEEE Trans. Robot. Automat.*, 17(6):890–897, Dec. 2001.
71. P. M. Newman. *On the Structure and Solution of the Simultaneous Localisation and Map Building Problem*. PhD thesis, The University of Sydney, Sydney, Mar. 1999.

72. A. Ohya, A. Kosaka, and A. C. Kak. Vision-based navigation by a mobile robot with obstacle avoidance using single-camera vision and ultrasonic sensing. *IEEE Trans. Robot. Automat.*, 14(6):969–978, Dec. 1998.
73. A. Papoulis. *Probability, Random Variables, and Stochastic Processes*. McGraw Hill, New York, 3rd. edition, 1991.
74. I. B. Risteski and K. G. Trenčevski. Principal values and principal subspaces of two subspaces of vector spaces with inner product. *Cont. Algebra Geom.*, 42(1):289–300, 2001.
75. S. Roweis and Z. Ghahramani. A unifying review of linear gaussian models. *Neural Comput.*, 11:305–345, 1999.
76. A. Saffiotti. The uses of fuzzy logic in autonomous robot navigation: a catalogue raisonné. *Soft Computing*, 1(4):180–197, 1997.
77. A. Saffiotti and L. P. Wesley. Perception-based self-localization using fuzzy locations. In *Proc. Int. Workshop Reasoning Uncert. Robot.*, pages 368–385, Amsterdam, 1996.
78. R. Sim, G. Dudek, and N. Roy. Online control policy optimization for minimizing map uncertainty during exploration. In *Proc. IEEE Int. Conf. Robot. Automat.* [4].
79. R. C. Smith and P. Cheeseman. On the representation and estimation of spatial uncertainty. *Int. J. Robot. Res.*, 5(4):56–68, 1986.
80. B. Southall, B. F. Buxton, and J. A. Marchant. Controllability and observability: Tools for kalman filter design. In J. N. Carter and M. S. Nixon, editors, *Proc. British Machine Vision Conf.*, pages 164–173, Southampton, 1998.
81. G Strang. *Linear Algebra and its Applications*. Saunders College Publishing, Fort Worth, 3rd edition, 1988.
82. R. Talluri and J. K. Aggarwal. Mobile robot self-location using model-image feature correspondence. *IEEE Trans. Robot. Automat.*, 12(1):63–77, Feb. 1996.
83. J. D. Tardós, J. Neira, P. M. Newman, and J. J. Leonard. Robust mapping and localization in indoor environments using sonar data. *Int. J. Robot. Res.*, 21(4):311–330, 2002.
84. S. Thrun. Probabilistic algorithms in robotics. *AI Mag.*, 21(4):93–109, 2000.
85. S. Thrun, Y. Liu, D. Koller, A. Y. Ng, Z. Ghahramani, and H. Durrant-Whyte. Simultaneous localization and mapping with sparse extended information filters. *Int. J. Robot. Res.*, 23(7-8):693–716, Jul. 2004.
86. S. Thrun, S. Thayer, W. Whittaker, C. Baker, W. Burgard, D. Ferguson, D. Hanel, M. Montemerlo, A. Morris, Z. Omohundro, and C. Reverte. Autonomous exploration and mapping of abandoned mines. *IEEE Robot. Automat. Mag.*, 11(4):79–91, Dec. 2004.
87. C. Tomasi. *Mathematical methods for robotics and vision*. Lecture Notes. Spring 2000. Stanford, 2000.
88. T. Vidal-Calleja, J. Andrade-Cetto, and A. Sanfeliu. Conditions for suboptimal filter stability in SLAM. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.* [5], pages 27–32.
89. T. Vidal-Calleja, J. Andrade-Cetto, and A. Sanfeliu. Estimator stability analysis in SLAM. In *Proc. 5th IFAC/EURON Sym. Intell. Auton. Vehicles*, Lisbon, Jul. 2004.
90. R. Volpe, T. Litwin, and L. Matthies. Mobile robot localization by remote viewing of a colored cylinder. In *Proc. IEEE/RSJ Int. Conf. Intell. Robots Syst.*, volume 1, pages 257–263, Pittsburgh, 1995.

91. G. Welch and G. Bishop. SCAAT: Incremental tracking with incomplete information. In T. Whitted, editor, *Computer Graphics. Proc. ACM SIGGRAPH Conf.*, pages 333–344, Los Angeles, Aug. 1997. ACM Press.
92. G. Welch and G. Bishop. An introduction to the Kalman filter. Course 8. In *Proc. ACM SIGGRAPH Conf.*, Los Angeles, Aug. 2001. ACM Press.
93. G. F. Welch. *SCAAT: Incremental Tracking with Incomplete Information*. PhD thesis, The University of North Carolina at Chapel Hill, Chapel Hill, Oct. 1996.
94. Z. Zhang. Parameter estimation techniques: A tutorial with application to conic fitting. *Image Vision Comput.*, 15(1):59–76, 1997.