

References

1. Robomower, <http://www.friendlyrobotics.com>
2. Acar, E.U., Choset, H.: Sensor-Based Coverage of Unknown Environments: Incremental Construction of Morse Decompositions. *International Journal of Robotics Research* 21(4), 345–366 (2002)
3. Ailor, W.: Space Traffic Control: A View of the Future. *Space Policy* 18(2), 99–105 (2002)
4. Akella, S., Hutchinson, S.: Coordinating the Motions of Multiple Robots with Specified Trajectories. In: *IEEE International Conference on Robotics and Automation*, May 2002, pp. 624–631 (2002)
5. Alighanbari, M., How, J.: An Unbiased Kalman Consensus Algorithm. In: *Proceedings of the American Control Conference*, pp. 3519–3524 (2006)
6. Baillieul, J., Antsaklis, P.J.: Control and Communication Challenges in Networked Real-Time Systems. *Proceedings of the IEEE* 95(1), 9–28 (2007)
7. Basseville, M.E., Nikiforov, I.V.: Detection of Abrupt Changes: Theory and Application. In: *Information and System Sciences*. Prentice-Hall (April 1993)
8. Beard, R.W., McLain, T.W.: Multiple UAV Cooperative Search under Collision Avoidance and Limited Range Communication Constraints. In: *IEEE Conference on Decision and Control*, December 2003, pp. 25–30 (2003)
9. Bellingham, J.S., Tillerson, M., Alighanbari, M., How, J.P.: Cooperative Path Planning for Multiple UAVs in Dynamic and Uncertain Environments. In: *Proceedings of the IEEE Conference on Decision and Control*, December 2002, pp. 2816–2822 (2002)
10. Benkoski, S., Monticino, M., Weisinger, J.: A Survey of the Search Theory Literature. *Naval Research Logistics* 38(4), 469–494 (1991)
11. Bertozzi, M., Broggi, A., Fascioli, A.: Vision-Based Intelligent Vehicles: State of the Art and Perspectives. *Robotics and Autonomous Systems* 32, 1–16 (2000)
12. Bertuccelli, L.F., How, J.P.: Robust UAV Search for Environments with Imprecise Probability Maps. In: *Proceedings of the 44th IEEE Conference on Decision and Control, and the European Control Conference*, December 2005, pp. 5680–5685 (2005)
13. Bertuccelli, L.F., How, J.P.: Bayesian Forecasting in Multi-vehicle Search Operations. In: *AIAA Guidance, Navigation, and Control Conference and Exhibit* (August 2006)
14. Blum, R.S., Kassam, A., Poor, H.V.: Distributed Detection with Multiple Sensors: Part 2 - Advanced Topics. *Proc. IEEE* 85(1), 64–79 (1997)
15. Cassandras, C.G., Li, W.: Sensor Networks and Cooperative Control. *European Journal of Control* 11(4-5), 436–463 (2005)

16. Chandler, P., Pachter, M., Nygard, K., Swaroop, D.: Cooperative Control for Target Classification. In: Murphey, R., Pardalos, P.M. (eds.) *Cooperative Control and Optimization*, pp. 1–19. Kluwer Academic Publishers (2002)
17. Chandler, P.R., Pachter, M., Rasmussen, S.: UAV Cooperative Control. In: *Proceedings of the American Control Conference*, June 2001, pp. 50–55 (2001)
18. Chen, S.Y., Li, Y.F.: Automatic Sensor Placement for Model-Based Robot Vision. *IEEE Transactions on Systems, Man, and Cybernetics I- Part B: Cybernetics* 34(1), 393–408 (2004)
19. Choi, H.-L., Brunet, L., How, J.P.: Consensus-Based Decentralized Auctions for Robust Task Allocation. *IEEE Transactions on Robotics* 25(4), 912–926 (2009)
20. Choset, H.: Coverage for Robotics: A Survey of Recent Results. *Annals of Mathematics and Artificial Intelligence* 31(1), 113–126 (2001)
21. Choset, H., Nagatani, K.: Topological Simultaneous Localization and Mapping (SLAM): Toward Exact Localization without Explicit Localization. *IEEE Transactions on Robotics and Automation* 17, 125–137 (2001)
22. Coifmana, B., Beymer, D., McLauchlan, P., Malik, J.: A Real-Time Computer Vision System for Vehicle Tracking and Traffic Surveillance. *Transportation Research Part C: Emerging Technologies* 6(4), 271–288 (1998)
23. Cortés, J., Martínez, S., Bullo, F.: Spatially Distributed Coverage Optimization and Control with Limited-Range Interactions. In: *ESAIM. Control, Optimisation and Calculus of Variations*, pp. 691–719 (2005)
24. Cortés, J., Martínez, S., Karatus, T., Bullo, F.: Coverage Control for Mobile Sensing Networks. *IEEE Transactions on Robotics and Automation* 20(2), 243–255 (2004)
25. Cover, T.M., Thomas, J.A.: *Elements of Information Theory*, 2nd edn. Wiley (2006)
26. Davids, A.: Urban Search and Rescue Robots: from Tragedy to Technology. *IEEE Intelligent Systems* 17(2), 81–83 (2002)
27. DeBolt, C., O'Donnell, C., Freed, C., Nguyen, T.: The BUGS (Basic UXO Gathering Systems) Project for UXO Clearance & Mine Countermeasures. In: *IEEE International Conference on Robotics and Automation*, April 1997, pp. 329–332 (1997)
28. Dissanayake, G., Newman, P., Clark, S., Durrant-Whyte, H.F., Csorba, M.: A Solution to the Simultaneous Localization and Map Building (SLAM) Problem. *IEEE Transactions on Robotics and Automation* 17(3), 229–241 (2001)
29. Drezner, Z.: *Facility Location: A Survey of Applications and Methods*. Springer, New York (1995)
30. Du, Q., Faber, V., Gunzburger, M.: Centroidal Voronoi Tessellations: Applications and Algorithms. *SIAM Review* 41(4), 637–676 (1999)
31. Dunbar, W.B., Murray, R.M.: Distributed Receding Horizon Control with Application to Multi-Vehicle Formation Stabilization. *Automatica* 42(4), 549–558 (2006)
32. Earl, M.G., D' Andrea, R.: Modeling and Control of a Multi-Agent System using Mixed Integer Linear Programming. In: *Proceedings of the IEEE Conference on Decision and Control*, December 2002, pp. 107–111 (2002)
33. Elmogy, A.M., Karray, F.O., Khamis, A.M.: Auction-Based Consensus Mechanism for Cooperative Tracking in Multi-Sensor Surveillance Systems. *Journal of Advanced Computational Intelligence and Intelligent Informatics* 14(1), 13–20 (2010)
34. Erwin, R.S., Albuquerque, P., Jayaweera, S.K., Hussein, I.I.: Dynamic Sensor Tasking for Space Situational Awareness. In: *American Control Conference*, June/July 2010, pp. 1153–1158 (2010)
35. Fax, J.A., Murray, R.M.: *Graph Laplacians and Stabilization of Vehicle Formations*. Technical report, California Institute of Technology (2001)

36. Finke, J., Passino, K.M., Sparks, A.: Stable Task Load Balancing Strategies for Cooperative Control of Networked Autonomous Air Vehicles. *IEEE Transactions on Control System Technology* 14(5), 789–803 (2006)
37. Fiorelli, E., Leonard, N.E., Bhatta, P., Paley, D.A., Bachmayer, R., Fratantoni, D.M.: Multi-AUV Control and Adaptive Sampling in Monterey Bay. In: *IEEE Autonomous Underwater Vehicles 2004: Workshop on Multiple AUV Operations (AUV 2004)*, June 2004, pp. 134–147 (2004)
38. Flanders, H.: Differentiation Under the Integral Sign. *The American Mathematical Monthly* 80(6), 615–627 (1973)
39. Flint, M., Polycarpou, M., Fernández-Gaucherand, E.: Cooperative Control for Multiple Autonomous UAV's Searching for Targets. In: *Proceedings of the 41st IEEE Conference on Decision and Control*, December 2002, pp. 2823–2828 (2002)
40. Furukawa, T., Bourgault, F., Lavis, B., Durrant-Whyte, H.F.: Recursive Bayesian Search-and-Tracking using Coordinated UAVs for Lost Targets. In: *Proceedings of the 2006 IEEE International Conference on Robotics and Automation*, May 2006, pp. 2521–2526 (2006)
41. Furukawa, T., Durrant-Whyte, H.F., Lavis, B.: The Element-based Method - Theory and its Application to Bayesian Search and Tracking. In: *IEEE/RSJ International Conference on Intelligent Robots and Systems*, October 2007, pp. 2807–2812 (2007)
42. Ganapathy, S., Passino, K.M.: Distributed Agreement Strategies for Cooperative Control: Modeling and Scalability Analysis. In: Butenko, S., Murphey, R., Pardalos, P.M. (eds.) *Recent Developments in Cooperative Control and Optimization*. Kluwer Academic Publishers (2004)
43. Ganguli, A., Susca, S., Martínez, S., Bullo, F., Cortés, J.: On Collective Motion in Sensor Networks: Sample Problems and Distributed Algorithms. In: *IEEE Conference on Decision and Control* (December 2005)
44. Gelb, A. (ed.): *Applied Optimal Estimation*, pp. 107–119. MIT Press, Cambridge (1974)
45. Gerkey, B.P., Mataric, M.J.: A Formal Framework for the Study of Task Allocation in Multi-Robot Systems. *International Journal of Robotics Research* 23(9), 939–954 (2004)
46. Ghosh, M., Mukhopadhyay, N., Sen, P.K.: *Sequential Estimation*, 2nd edn. Wiley Series in Probability and Statistics - Applied Probability and Statistics Section Series, vol. 117. Wiley-interscience (1997)
47. Gill, M., Zomaya, A.: Obstacle Avoidance in Multi-Robot Systems: Experiments in Parallel Genetic Algorithms. In: *Robotics and Intelligent Systems*, vol. 20. World Scientific (1998)
48. Godsil, C., Royle, G.: *Algebraic Graph Theory*. In: *Graduate Texts in Mathematics*, vol. 207. Springer, New York (2001)
49. Grocholsky, B.: *Information-Theoretic Control of Multiple Sensor Platforms*. Ph.D. dissertation, The University of Sydney (2002)
50. Grocholsky, B., Durrant-Whyte, H., Gibbens, P.: An Information-Theoretic Approach to Decentralized Control of Multiple Autonomous Flight Vehicles. In: *SPIE Proceedings Series, International Society for Optical Engineering Proceedings Series*, vol. 4196, pp. 348–359 (2000)
51. Grocholsky, B., Makarenko, A., Durrant-Whyte, H.: Information-Theoretic Coordinated Control of Multiple Sensor Platforms. In: *International Conference on Robotics and Automation*, September 2003, pp. 1521–1526 (2003)

52. Hanselmann, T., Morelande, M., Moran, B., Sarunic, P.: Sensor Scheduling for Multiple Target Tracking and Detection using Passive Measurements. In: 11th International Conference on Information Fusion, pp. 1–8 (2008)
53. Hernandez, M.L., Kirubarajan, T., Bar-Shalom, Y.: Multisensor Resource Deployment Using Posterior Cramér-Rao Bounds. *IEEE Transactions on Aerospace and Electronic Systems* 40(2), 399–416 (2004)
54. Hero, A.O., Ma, B., Michel, O., Gorman, J.: Alpha-Divergence for Classification, Indexing and Retrieval. Technical report cspl-328, Communications and Signal Processing Laboratory (May 2001)
55. Hert, S., Tiwari, S., Lumelsky, V.: A Terrain-Covering Algorithm for an AUV. *Autonomous Robots* 3(2/3), 91–119 (1996)
56. Horne, J.K.: Fisheries and Marine Mammal Opportunities in Ocean Observations. In: Heraklion, C. (ed.) *Proceedings of Underwater Acoustic Measurements: Technologies & Results* (2005)
57. Hussein, I.I.: Motion Planning for Multi-Spacecraft Interferometric Imaging System. Ph.d. dissertation, University of Michigan, Ann Arbor (2005)
58. Hussein, I.I.: A Kalman-Filter Based Control Strategy for Dynamic Coverage Control. In: *Proceedings of the American Control Conference*, pp. 3271–3276 (2007)
59. Hussein, I.I., Stipanović, D.: Effective Coverage Control using Dynamic Sensor Networks. In: 2006 IEEE Conference on Decision and Control, December 2006, pp. 2747–2752 (2006)
60. Hussein, I.I., Stipanović, D.: Effective Coverage Control for Mobile Sensor Networks with Guaranteed Collision Avoidance. *IEEE Transactions on Control Systems Technology*, Special Issue on Multi-Vehicle Systems Cooperative Control with Applications 15(4), 642–657 (2007)
61. Hussein, I.I., Stipanović, D.: Effective Coverage Control using Dynamic Sensor Networks with Flocking and Guaranteed Collision Avoidance. In: 2007 American Control Conference, July 2007, pp. 3420–3425 (2007)
62. Hussein, I.I., Stipanović, D.M., Wang, Y.: Reliable Coverage Control using Heterogeneous Vehicles. In: 46th IEEE Conference on Decision and Control, December 2007, pp. 6142–6147 (2007)
63. Istepanian, R., Stojanovic, M. (eds.): *Underwater Acoustic Digital Signal Processing and Communication Systems*, 1st edn. Springer (2002)
64. Jacques, D.R.: Search, Classification and Attack Decisions for Cooperative Wide Area Search Munitions. In: Butenko, S., Murphey, R., Pardalos, P.M. (eds.) *Cooperative Control: Models, Applications and Algorithms*, pp. 75–93. Kluwer Academic Publishers (2003)
65. Jadbabaie, A., Lin, J., Morse, A.S.: Coordination of Groups of Mobile Autonomous Agents Using Nearest Neighbor Rules. *IEEE Transactions on Automatic Control* 48(6), 988–1001 (2003)
66. Jin, Y., Liao, Y., Minai, A.A., Polycarpou, M.M.: Balancing Search and Target Response in Cooperative Unmanned Aerial Vehicle (UAV) Teams. *IEEE Transactions on Systems, Man, and Cybernetics - Part B: Cybernetics* 36(3), 571–587 (2006)
67. Kemp, M., Hobson, B., Meyer, J., Moody, R., Pinnix, H., Schulz, B.: MASA: A Multi – AUV Underwater Search and Data Acquisition System. In: *Oceans 2002 MTS/IEEE*, October 2002, vol. 1, pp. 311–315 (2002)
68. Khatib, O.: Real-Time Obstacle Avoidance for Manipulators and Mobile Robots. *The International Journal of Robotics Research* 5(1), 90–98 (1986)
69. Klein, D.J., Morgansen, K.A.: Controlled Collective Motion for Trajectory Tracking. In: *Proceedings of the 2006 American Control Conference*, June 2006, pp. 5269–5275 (2006)

70. Kreucher, C., Hero III, A.O., Kastella, K.: A Comparison of Task Driven and Information Driven Sensor Management for Target Tracking. In: 44th IEEE Conference on Decision and Control, and the European Control Conference, December 2005, pp. 4004–4009 (2005)
71. Latombe, J.-C.: Robot Motion Planning. In: The Kluwer International Series in Engineering and Computer Science, vol. 124. Kluwer, Boston (1991)
72. Lavis, B., Furukawa, T., Durrant-Whyte, H.F.: Dynamic Space Reconfiguration for Bayesian Search-and-Tracking with Moving Targets. *Autonomous Robots* 24, 387–399 (2008)
73. L chevin, N., Rabbath, C.A., Lauzon, M.: A Decision Policy for the Routing and Munitions Management of Multifunctional Unmanned Combat Vehicles in Adversarial Urban Environments. *IEEE Transactions on Control Systems Technology* 17(3), 505–519 (2009)
74. Leonard, J.J., Durrant-Whyte, H.F.: Simultaneous Map Building and Localization for an Autonomous Mobile Robot. In: IEEE/RSJ International Workshop on Intelligent Robots and Systems IROS 1991, Osaka, Japan, November 1991, pp. 1442–1447 (1991)
75. Leonard, N.E., Paley, D., Lekien, F., Sepulchre, R., Fratantoni, D.M., Davis, R.: Collective Motion, Sensor Networks and Ocean Sampling. In: Proceedings of the IEEE, Special Issue on Networked Control Systems, vol. 95(1), pp. 48–74 (January 2007)
76. Li, W., Cassandras, C.G.: Distributed Cooperative Coverage Control of Sensor Networks. In: Proceedings of the IEEE Conference on Decision and Control, pp. 2542–2547 (2005)
77. Liu, J., Reich, J., Zhao, F.: Collaborative In-Network Processing for Target Tracking. *EURASIP Journal of Applied Signal Processing* 4, 378–391 (2003)
78. Lloyd, S.: Least Squares Quantization in PCM. *IEEE Transactions in Information Theory* 28(2), 129–137 (1982)
79. Lumelsky, V., Mukhopadhyay, S., Sun, K.: Dynamic Path Planning in Sensor-Based Terrain Acquisition. *IEEE Transactions on Robotics and Automation* 6(4), 462–472 (1990)
80. Mahler, R.: Multisensor-Multitarget Sensor Management: A Unified Bayesian Approach. In: Signal Processing, Sensor Fusion, and Target Recognition XII, vol. 5096, pp. 222–233 (2003)
81. Mahler, R.: Objective Functions for Bayesian Control-Theoretic Sensor Management, I: Multitarget First-Moment Approximation. In: Proceedings of IEEE Aerospace Conference, pp. 1905–1923 (2003)
82. Mak, L.C., Kumon, M., Whitty, M., Katupitiya, J., Furukawa, T.: Design and Development of Micro Aerial Vehicles and their Cooperative Systems for Target Search and Tracking. *International Journal of Micro Air Vehicles* 1(2), 139–153 (2009)
83. Mataric, M.J.: Using Communication to Reduce Locality in Distributed Multi-Agent Learning. *Journal of Experimental and Theoretical Artificial Intelligence* 10(3), 357–369 (1998)
84. McLain, T.W., Chandler, P.R., Pachter, M.: A Decomposition Strategy for Optimal Coordination of Unmanned Air Vehicles. In: Proceedings of the American Control Conference, June 2000, pp. 369–373 (2000)
85. Mechtov, K., Sundresh, S., Kwon, Y., Agha, G.: Cooperative Tracking with Binary-Detection Sensor Networks. Technical report, University of Illinois at Urbana-Champaign (September 2003)
86. Meguerdichian, S., Koushanfar, F., Potkonjak, M., Srivastava, M.B.: Coverage Problems in Wireless Ad-hoc Sensor Networks. In: Proceedings of IEEE INFOCOM, pp. 1380–1387 (2001)

87. Mihaylova, L., Lefebvre, T., Bruyninckx, H., Gadeyne, K.: Active Sensing for Robotics-A Survey. In: Proceedings of the 5th International Conference on Numerical Methods and Applications, pp. 316–324 (2002)
88. Miller, J.G.: A New Sensor Allocation Algorithm for the Space Surveillance Network. *Military Operations Research* 12, 57–70 (2007)
89. Mindell, D., Bingham, B.: New Archaeological Uses of Autonomous Underwater Vehicles. In: MTS/IEEE Conference and Exhibition, OCEANS 2001, vol. 1, pp. 555–558 (2001)
90. Montemerlo, M., Thrun, S., Koller, D., Wegbreit, B.: FastSLAM: A Factored Solution to the Simultaneous Localization and Mapping Problem. In: Proceedings of the AAAI National Conference on Artificial Intelligence, pp. 593–598 (2002)
91. Morris, S., Frew, E.W., Jones, H.: Cooperative Tracking of Moving Targets by Teams of Autonomous Unmanned Air Vehicles. Technical report, University of Colorado at Boulder (July 2005)
92. Mottaghi, R., Payandeh, S.: An Overview of a Probabilistic Tracker for Multiple Cooperative Tracking Agents. In: International Conference on Advanced Robotics, July 2005, pp. 888–894 (2005)
93. Murino, V., Trucco, A.: Three-Dimensional Image Generation and Processing in Underwater Acoustic Vision. *Proceedings of the IEEE* 88(12), 1903–1946 (2000)
94. Murino, V., Trucco, A., Regazzoni, C.S.: A Probabilistic Approach to the Coupled Reconstruction and Restoration of Underwater Acoustic Images. *IEEE Transaction on Pattern Analysis and Machine Intelligence* 20(1), 9–22 (1998)
95. Murray, R.M.: Recent Research in Cooperative Control of Multivehicle Systems. *Journal of Dynamic Systems, Measurement, and Control* 129(5), 571–583 (2007)
96. Nygard, K.E., Chandler, P.R., Pachter, M.: Dynamic Network Flow Optimization Models for Air Vehicle Resource Allocation. In: American Control Conference, June 2001, pp. 1853–1858 (2001)
97. Oh, Y.-J., Watanabe, Y.: Development of Small Robot for Home Floor Cleaning. In: The 41st SICE Annual Conference, August 2002, pp. 3222–3223 (2002)
98. Ohya, A., Kosaka, A., Kak, A.: Vision-Based Navigation by a Mobile Robot with Obstacle Avoidance using Single-Camera Vision and Ultrasonic Sensing. *IEEE Transactions on Robotics and Automation* 14(6), 969–978 (1998)
99. Okabe, A., Suzuki, A.: Locational Optimization Problems Solved through Voronoi Diagrams. *European Journal of Operational Research* 98(3), 445–456 (1997)
100. Olfati-Saber, R., Murray, R.M.: Distributed Cooperative Control of Multiple Vehicle Formations. In: Proceedings of the 15th IFAC World Congress (July 2002)
101. Olfati-Saber, R., Murray, R.M.: Consensus Problems in Networks of Agents With Switching Topology and Time-Delays. *IEEE Transactions on Automatic Control* 49(9), 1520–1533 (2004)
102. Ollero, A., Martínez de Dios, J.R., Merino, L.: Unmanned Aerial Vehicles as Tools for Forest-Fire Fighting. In: V International Conference on Forest Fire Research (2006)
103. Page, E.S.: Continuous Inspection Scheme. *Biometrika* 41(1/2), 100–115 (1954)
104. Parker, L.: Cooperative Robotics for Multi-Target Observation. *Intelligent Automation and Soft Computing* 5(1), 5–19 (1999)
105. Poor, H.V.: An Introduction to Signal Detection and Estimation, 2nd edn. Springer (1994)
106. Poor, H.V., Hadjiladis, O.: Quickest Detection, 1st edn. Cambridge University Press (December 2008)
107. Ren, W., Beard, R.W., Kingston, D.B.: Multi-Agent Kalman Consensus with Relative Uncertainty. In: Proceedings of the American Control Conference, pp. 1865–1870 (2005)

108. Rényi, A.: On Measures of Information and Entropy. In: Proceedings of the 4th Berkeley Symposium on Mathematics, Statistics and Probability, pp. 547–561 (1961)
109. Roberts, S.W.: A Comparison of Some Control Chart Procedures. *Technometrics* 8(3), 411–430 (1966)
110. Ross, S., Pineau, J., Paquet, S., Chaib-draa, B.: Online Planning Algorithms for POMDPs. *Journal of Artificial Intelligence Research* 32(2), 663–704 (2008)
111. Rumsfeld, D.H.: Report of the Commission to Assess United States National Security Space Management and Organization. Technical report, United States Congress (January 2001)
112. Schonhoff, T.A., Giordano, A.A.: Detection and Estimation Theory and Its Applications. Prentice Hall (2006)
113. Shiryaev, A.N.: Optimal Stopping Rules. Springer (November 2007)
114. Sinha, A., Kirubarajan, T., Bar-Shalom, Y.: Autonomous Ground Target Tracking by Multiple Cooperative UAVs. In: IEEE Aerospace Conference, pp. 1–9 (2005)
115. Smith, T.: Probabilistic Planning for Robotic Exploration. PhD thesis, Carnegie Mellon University (July 2007)
116. Spires, S., Goldsmith, S.: Exhaustive Geographic Search with Mobile Robots Along Space-Filling Curves. In: 1st International Workshop on Collective Robotics, pp. 1–12 (1998)
117. Spletzer, J.R., Taylor, C.J.: Dynamic Sensor Planning and Control for Optimally Tracking Targets. *The International Journal of Robotics Research* (1), 7–20 (2003)
118. Sujit, P.B., Beard, R.: Distributed Sequential Auctions for Multiple UAV Task Allocation. In: Proceedings of 2007 American Control Conference, July 2007, pp. 3955–3960 (2007)
119. Sujit, P.B., Ghose, D.: Multiple UAV Search using Agent Based Negotiation Scheme. In: American Control Conference, June 2005, pp. 2995–3000 (2005)
120. Svennebring, J., Koenig, S.: Building Terrain-Covering Ant Robots: A Feasibility Study. *Autonomous Robots* 16(3), 313–332 (2004)
121. Tanner, H.G., Jadbabaie, A., Pappas, G.J.: Stable Flocking of Mobile agents, Part I: Fixed Topology. In: 42nd IEEE Conference on Decision and Control, December 2003, pp. 2010–2015 (2003)
122. Tanner, H.G., Jadbabaie, A., Pappas, G.J.: Stable Flocking of Mobile agents, Part II: Dynamic Topology. In: 42nd IEEE Conference on Decision and Control, December 2003, pp. 2016–2021 (2003)
123. Tanner, H.G., Jadbabaie, A., Pappas, G.J.: Flocking in Fixed and Switching Networks. *Transactions on Automatic Control* 52(5), 863–868 (2007)
124. Thrun, S., Burgard, W., Fox, D.: Probabilistic Robotics. In: Intelligent Robotics and Autonomous Agents. The MIT Press (September 2005)
125. Tisdale, J., Ryan, A., Kim, Z., Törnqvist, D., Hedrick, J.K.: A Multiple UAV System for Vision-Based Search and Localization. In: American Control Conference, June 2008, pp. 1985–1990 (2008)
126. Van Trees, H.L.: Detection, Estimation, and Modulation Theory, vol. I. John Wiley & Sons (2003)
127. Vidal, R., Shakernia, O., Kim, H.J., Shim, D.H., Sastry, S.: Probabilistic Pursuit-Evasion Games: Theory, Implementation and Experimental Evaluation. *IEEE Transactions on Robotics and Automation* 18(5), 662–669 (2002)
128. Viswanathan, R., Varshney, P.K.: Distributed Detection with Multiple Sensors: Part I - Fundamentals. *Proc. IEEE* 85(1), 54–63 (1997)
129. von Alt, C.: REMUS 100 Transportable Mine Countermeasure Package. In: Oceans 2003 Proceedings, San Diego, CA, September 2003, vol. 4, pp. 1925–1930 (2003)

130. Wagner, I., Lindenbaum, M., Bruckstein, A.: Distributed Covering by Ant-Robots using Evaporating Traces. *IEEE Transactions on Robotics and Automation* 15(5), 918–933 (1999)
131. Wald, A.: Sequential Tests of Statistical Hypotheses. *The Annals of Mathematical Statistics* 16(2), 117–186 (1945)
132. Wald, A.: Sequential Analysis. Dover Publications (2004)
133. Wald, A., Wolfowitz, J.: Bayes Solutions of Sequential Decision Problems. *The Annals of Mathematical Statistics* 21(1), 82–99 (1950)
134. Wang, B.: Coverage Control in Sensor Networks. Springer (2010)
135. Wang, Y., Hussein, I.I.: Cooperative Vision-based Multi-vehicle Dynamic Coverage Control for Underwater Applications. In: Proceedings of the IEEE Multiconference on Systems and Control, pp. 82–87 (2007) (invited paper)
136. Wang, Y., Hussein, I.I.: Underwater Acoustic Imaging using Autonomous Vehicles. In: 2008 IFAC Workshop on Navigation, Guidance and Control of Underwater Vehicles (April 2008)
137. Wang, Y., Hussein, I.I.: Awareness Coverage Control Over Large Scale Domains with Intermittent Communications. *IEEE Transactions on Automatic Control* 55(8), 1850–1859 (2010)
138. Wang, Y., Hussein, I.I.: Bayesian-Based Decision-Making for Object Search and Classification. *IEEE Transactions on Control Systems Technology* (2010) (in press)
139. Wang, Y., Hussein, I.I., Brown III, D.R., Erwin, R.S.: Cost-Aware Sequential Bayesian Tasking and Decision-Making for Search and Classification. In: American Control Conference, pp. 6423–6428 (2010)
140. Wang, Y., Hussein, I.I., Erwin, R.S.: Awareness-Based Decision Making for Search and Tracking. In: American Control Conference, pp. 3169–3175 (2008) (invited paper)
141. Wang, Y., Hussein, I.I., Erwin, R.S.: Bayesian Detection and Classification for Space-Augmented Space Situational Awareness under Intermittent Communications. In: Military Communications Conference (MILCOM), October 2010, pp. 960–965 (2010)
142. Whalen, A.D.: Detection of Signals in Noise. Academic Press, New York (1971)
143. Winfield, A.: Distributed Sensing and Data Collection via Broken Ad Hoc Wireless Connected Networks of Mobile Robots. In: Proceedings of 5th International Symposium on Distributed Autonomous Robotic Systems, pp. 273–282 (2000)
144. Wintenby, J., Krishnamurthy, V.: Hierarchical Resource Management in Adaptive Airborne Surveillance Radars. *IEEE Transactions on Aerospace and Electronic Systems* 42(2), 401–420 (2006)
145. Wong, S., MacDonald, B.: A Topological Coverage Algorithm for Mobile Robots. In: IEEE/RSJ International Conference on Intelligent Robots and Systems, October 2003, pp. 1685–1690 (2003)
146. Yang, S., Luo, C.: A Neural Network Approach to Complete Coverage Path Planning. *IEEE Transactions on Systems, Man, and Cybernetics - Part B: Cybernetics* 34(1), 718–724 (2004)
147. Yang, Y., Polycarpou, M.M., Minai, A.A.: Multi-UAV Cooperative Search using an Opportunistic Learning Method. *Journal of Dynamic Systems, Measurement, and Control* 129(5), 716–728 (2007)
148. Yu, X., Azimi-Sadjadi, M.R.: Neural Network Directed Bayes Decision Rule for Moving Target Classification. *IEEE Transactions on Aerospace and Electronic Systems* 36(1), 176–188 (2000)

Index

- Acoustic imaging, 23
- Active sensing, 12
- Aerial wildfire control, 13
- Autonomous underwater vehicles, 18
- AUV, 18
- Awareness coverage control, 7
- Awareness metric, 37
- Awareness-based decision-making, 7

- Bayes filter, 6, 49, 55
- Bayes risk, 89, 94, 105, 106, 130, 135
- Bayes' rule, 51, 55, 80, 116
- Bayesian hypothesis testing, 92, 109
- Bayesian sequential detection, 7, 89, 90, 92, 95, 105, 125, 132, 134, 136
- Bayesian sequential estimation, 7, 132, 134, 136
- Bayesian-based coverage control, 7
- Bayesian-based probabilistic decision-making, 7
- Beam pattern, 27
- Beam signal, 27
- Beamforming, 26
- Bernoulli distribution, 50, 79, 91
- Binomial coefficient, 56
- Binomial distribution, 58, 91
- Binomial random variable, 49

- Change-point detection theory, 90
- Classification cost function, 70
- Collision avoidance, 13
- Conditional Bayes risk, 93, 94, 105, 131, 135
- Conditional probability mass function, 50

- Configuration space, 13
- Cooperative coverage control, 11
- Coverage control, 4, 7, 11
- Coverage path planning, 4, 13
- Cumulative Sum Control Chart, 90
- CUSUM, 90

- Decision cost matrix, 92
- Decision fusion, 115
- Dempster-Shafer evidential method, 4
- Detection probability, 50, 51, 103, 124
- Deterministic decision rule, 93, 105
- Distribution density function, 13
- Domain Search, 1
- Dynamic cooperative coverage control, 12
- Dynamic coverage control, 5, 7

- Earth's gravitational parameter, 114
- Eccentricity, 114
- Effective coverage, 15, 28
- Error function, 15
- Expected information gain, 138
- Expected stopping time, 94

- False alarm, 1
- Fischer information measure, 6
- Flocking, 13
- Fourier/Fresnel approximation, 27

- General conditional probability matrix, 50, 79, 91, 93, 106, 107
- Geosynchronous orbit, 111, 114
- Graphy theory, 3

- Hypotheses, 125

- Information entropy, 52, 108
- Instantaneous coverage function, 14
- Kalman filter, 26, 49, 129
- Kalman gain, 130
- Keplerian motion, 113
- Laplacian, 3
- Large-scale domain, 2, 34, 35, 54
- Law of total probability, 51, 55, 56, 104
- Lloyd algorithm, 11
- Lyapunov function, 17
- MAP, 109
- Markov chain, 119, 124, 129
- Mathematical induction, 60
- MAV, 3
- Maximum a posterior estimator, 109
- MILP, 3
- Minimax hypothesis testing, 92
- Minimum Bayes risk, 95, 105, 106, 126, 132
- Minimum Bayesian risk, 98
- Miss Detection, 1
- Mission domain, 2
- Mixed-integer linear programming, 3
- Monte-Carlo simulation, 83, 86, 109
- Motion planning, 4
- Multinomial distribution, 103
- Neyman-Pearson hypothesis testing, 90, 92
- Nominal control law, 16
- Non-zero measure, 13, 34
- Object Classification, 1
- Observation cost, 94, 99, 116, 124, 138
- Observation random variable, 50, 124
- Occupancy grid mapping, 4, 49
- Optimal localization, 5, 11
- Optimal redeployment, 5, 11
- Page test, 90
- Partially Observable Markov Decision Process, 90
- partially observable Markov decision processes, 7
- Particle filter, 6
- Penalty function, 16
- Perturbation control law, 17
- POMDP, 7, 90
- Quadratic cost assignment, 131, 135
- Rényi information measure, 124, 139
- Range-angle sensors, 114
- Reasonable deterministic decision rule, 93, 106
- Receding horizon control, 3
- Recursive Bayesian Filter, 6
- Risk-based sequential decision-making, 7
- SBSS, 8, 79, 110
- Search and rescue, 2, 13
- Search cost function, 62, 70, 99
- Search uncertainty, 52
- Semi-major axis, 114
- Sensor fusion, 4
- Sequential Probability Ratio Test, 90
- Shyriaev-Roberts tests, 90
- Simultaneous Localization and Mapping, 4, 13
- SLAM, 4, 13, 49
- Small-scale domain, 12, 35
- Space Situational Awareness, 7, 79, 112
- Space Surveillance Network, 112
- Space-Based Space Surveillance, 8, 79, 110
- SPRT, 90
- SSA, 7, 79, 112
- SSN, 112
- State random variable, 49
- Steering direction, 26
- Substitution law, 56
- Sufficient statistic, 132
- Transformed state of awareness, 34
- Transitional probability matrix, 119, 124
- True anomaly, 114
- UAV, 3
- UCA, 92–94, 105, 125, 131
- Uncertainty map, 52
- Uniform Cost Assignment, 92, 125, 130
- Unmanned aerial vehicles, 3
- Voronoi cell, 11
- Voronoi partition, 11