

REFERENCES

- Aghababa, M. P. (2012), '3D path planning for underwater vehicles using five evolutionary optimization algorithms avoiding static and energetic obstacles', *Applied Ocean Research* **38**, 48–62.
URL: <http://dx.doi.org/10.1016/j.apor.2012.06.002>
- Ahmed, A. A., Abdalla, T. Y. & Abed, A. A. (2015), 'Path Planning of Mobile Robot by using Modified Optimized Potential Field Method', *International Journal of Computer Applications* **113**(4), 6–10.
- Arimura, H. (2010), 'Computer and Information Sciences', *Lecture Notes in Electrical Engineering* **62**, 353–358.
- Barber, C. B., Dobkin, D. P. & Huhdanpaa, H. (1996), 'The quickhull algorithm for convex hulls', *ACM Trans. Math. Softw.* **22**(4), 469–483.
URL: <http://doi.acm.org/10.1145/235815.235821>
- Besada-Portas, E., De La Torre, L., Moreno, A. & Risco-Martin, J. L. (2013), 'On the performance comparison of multi-objective evolutionary UAV path planners', *Information Sciences* **238**, 111–125.
URL: <http://dx.doi.org/10.1016/j.ins.2013.02.022>
- Boothby, W. M. (1975), *An Introduction to Differentiable Manifolds and Riemannian Geometry*, Academic Press.
- Brand, M., Masuda, M., Wehner, N. & Yu, X.-H. Y. X.-H. (2010), 'Ant Colony Optimization algorithm for robot path planning', *International Conference on Computer Design and Applications (ICCD)* **3**, 436–440.
- Campion, G., d'Andrea Novel, B. & Bastin, G. (1991), *Controllability and state feedback stabilizability of non holonomic mechanical systems*, Springer Berlin Heidelberg, Berlin, Heidelberg, pp. 106–124.
URL: <http://dx.doi.org/10.1007/BFb0039268>
- Chaari, I., Koubaa, A., Bennaceur, H., Ammar, A. & Trigui, S. (2014), On the Adequacy of Tabu Search for Global Robot Path Planning Problem in Grid Environments, in '5th International Conference on Ambient Systems, Networks and Technologies', Vol. 32, pp. 604–613.
- Chakraborty, S. (2013), 'Ant Colony System : A New Concept to Robot Path Planning', *International Journal of Hybrid Information Technology* **6**(6), 11–30.
- Choi, J. W. (2012), A potential field and bug compound navigation algorithm for nonholonomic wheeled robots, in 'Innovative Engineering Systems (ICIES), 2012 First International Conference on', pp. 166–171.



Cochran, J., Member, S. & Krstic, M. (2009), 'Nonholonomic Source Seeking With Tuning of Angular Velocity', *IEEE Transactions on Automatic Control* **54**(4), 717–731.

Cong, Y. Z. C. Y. Z. & Ponnambalam, S. (2009), 'Mobile robot path planning using ant colony optimization', *IEEE/ASME International Conference on Advanced Intelligent Mechatronics* pp. 1–6.

Corke, P. (2011), *Robotics, Vision and Control - Fundamental Algorithms in MATLAB*.

Dai, R. & Cochran, J. (2009), Path planning for multiple unmanned aerial vehicles by parameterized cornu-spirals, in 'American Control Conference', pp. 2391–2396.

Davis, J., Nehab, D., Ramamoorthi, R., Rusinkiewicz & Szymon (2005), 'Spacetime stereo: A unifying framework for depth from triangulation', *IEEE Transactions on Pattern Analysis and Machine Intelligence* **27**(2), 296–302.

De Berg, M., Cheong, O., Van Kreveld, M. & Overmars, M. (2008), *Computational Geometry: Algorithms and Applications*, Vol. 17.

URL: <http://www.google.com/books?id=tkyG8W2163YC>

Elbanhawi, M. & Simic, M. (2014), 'Sampling-based robot motion planning: A review', *IEEE Access* **2**, 56–77.

Feder, H. J. S. & Slotine, J. J. E. (1997), Real-time path planning using harmonic potentials in dynamic environments, in 'Robotics and Automation, 1997. Proceedings., 1997 IEEE International Conference on', Vol. 1, pp. 874–881 vol.1.

Fischler, M. A. & Bolles, R. C. (1981), 'Random sample consensus: A paradigm for model fitting with applications to image analysis and automated cartography', *Communications of the ACM* **24**(6), 381–395.

Ge, S. S. & Cui, Y. J. (2000), 'New potential functions for mobile robot path planning', *IEEE Transactions on Robotics and Automation* **16**(5), 615–620.

Gonzalez, D., Perez, J., Milanes, V. & Nashashibi, F. (2016), 'A Review of Motion Planning Techniques for Automated Vehicles', *IEEE Transactions on Intelligent Transportation Systems* **17**(4), 1135–1145.

Gorbenko, A. & V, P. (2013), 'Visual landmark selection for mobile robot navigation', *IAENG International Journal of Computer Science* **40**(3), 134–142.

Hassan, S. & Yoon, J. (2014), 'Haptic assisted aircraft optimal assembly path planning scheme based on swarming and artificial potential field approach', *Advances in Engineering Software* **69**, 18–25.

URL: <http://dx.doi.org/10.1016/j.advengsoft.2013.12.003>

Hautamäki, V., Cherednichenko, S., Kärkkäinen, I., Kinnunen, T. & Fränti, P. (2005), Improving K-means by Outlier Removal, in 'Proceedings of the 14th Scandinavian Conference on Image Analysis', SCIA'05, Springer-Verlag, Berlin, Heidelberg, pp. 978–987.



Hokuyo, A. (2009), 'Scanning Laser Range Finder URG-04LX-UG01'.

URL: <http://www.hokuyo-aut.jp/02sensor/07scanner>

Hota, S. & Ghose, D. (2009), 'A Modified Dubins Method for Optimal Path Planning of a Miniature Air Vehicle Converging to a Straight Line Path', *American Control Conference* pp. 2397–2402.

IPLAB (2015), 'Image processing lab (iplab).[online]'.

URL: <http://www.aforge.net/>

Ismail, A.-T., Sheta, A. & Al-Weshah, M. (2008), 'A mobile robot path planning using genetic algorithm in static environment', *Journal of Computer Science* **4**(4), 341–344.

Jarvis, R. (1973), 'On the identification of the convex hull of a finite set of points in the plane', *Information Processing Letters* **2**(1), 18 – 21.

URL: <http://www.sciencedirect.com/science/article/pii/0020019073900203>

Jia, Q. J. Q. & Wang, X. W. X. (2010), 'An improved potential field method for mobile robot path planning in dynamic environments', *Control and Decision Conference CCDC 2010 Chinese* **11**(1), 4847–4852.

URL: <http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=4593709>

Kala, R. (2012), 'Multi-robot path planning using co-evolutionary genetic programming', *Expert Systems with Applications* **39**(3), 3817–3831.

URL: <http://dx.doi.org/10.1016/j.eswa.2011.09.090>

Karaman, S. & Frazzoli, E. (2010), Optimal kinodynamic motion planning using incremental sampling-based methods, in '49th IEEE Conference on Decision and Control (CDC)', pp. 7681–7687.

Karaman, S. & Frazzoli, E. (2011), 'Sampling-based algorithms for optimal motion planning', *Int. J. Rob. Res.* **30**(7), 846–894.

URL: <http://dx.doi.org/10.1177/0278364911406761>

Karimi, J. & Pourtakdoust, S. H. (2013), 'Optimal maneuver-based motion planning over terrain and threats using a dynamic hybrid PSO algorithm', *Aerospace Science and Technology* **26**(1), 60–71.

URL: <http://dx.doi.org/10.1016/j.ast.2012.02.014>

Khatib, O. (1985), 'Real-Time Obstacle Avoidance for Manipulators and Mobile Robots', *International Journal of Robotic Research* **26**, 500–505.

Kim, J. & Crassidis, J. L. (2010), 'UAV path planning for maximum visibility of ground targets in an urban area', *13th International Conference on Information Fusion* pp. 1–7.

Koren, Y. & Borenstein, J. (1991), 'Potential field methods and their inherent limitations for mobile robot navigation', *IEEE International Conference on Robotics and Automation* pp. 1398–1404.



Kunchev, V., Jain, L., Ivancevic, V. & Finn, a. (2006), 'Path planning and obstacle avoidance for autonomous mobile robots: A review', *Knowledge-Based Intelligent* pp. 537–544.

Kuwata, Y., Teo, J., Fiore, G., Karaman, S., Frazzoli, E. & How, J. P. (2009), 'Real-time motion planning with applications to autonomous urban driving', *IEEE Transactions on Control Systems Technology* **17**(5), 1105–1118.

LaValle, S. M. (2006), *Planning Algorithms*, Vol. 2006, Cambridge University Press.

URL: <http://ebooks.cambridge.org/refid/CBO9780511546877>

LaValle, S. M. & Kuffner, J. J. (2001), 'Randomized Kinodynamic Planning', *The International Journal of Robotics Research* **20**(5), 1–37.

Lee, J., Nam, Y., Hong, S. & Cho, W. (2011), 'New Potential Functions with Random Force Algorithms Using Potential Field Method', *Journal of Intelligent & Robotic Systems* **66**(3), 303–319.

URL: <http://link.springer.com/10.1007/s10846-011-9595-z>

Li, F., Tan, Y., Wang, Y. & Apf, A. T. (2013), Mobile Robots Path Planning Based on Evolutionary Artificial Potential Fields Approach, in 'Proceedings of the 2nd International Conference on Computer Science and Electronics Engineering (ICCSEE 2013) Mobile', Vol. 0, pp. 1314–1317.

Li, L. (2014), 'Image Matching Algorithm based on Feature-point and DAISY Descriptor', *Journal of Multimedia* **9**(6), 829–834.

Li, X., Xie, J., Cai, M., Xie, M. & Wang, Z. (2009), 'Path planning for UAV based on improved heuristic A* algorithm', *Proceedings of 9th International Conference on Electronic Measurement and Instruments* **3**, 3488–3493.

Liu, L. L. L. & Zhang, S. Z. S. (2010), 'Three-dimensional flight path planning by artificial immune algorithm', *Sixth International Conference on Natural Computation (ICNC)* **6**, 2876–2880.

Liu, L. & Zhang, S. (2009), Voronoi diagram and GIS-based 3D path planning, in '17th International Conference on Geoinformatics', pp. 12–16.

Liu, Y.-k., Li, M.-k., Xie, C.-l., Peng, M.-j. & Xie, F. (2014), 'Path-planning research in radioactive environment based on particle swarm algorithm', *Progress in Nuclear Energy* **74**, 184–192.

URL: <http://linkinghub.elsevier.com/retrieve/pii/S0149197014000778>

Martín Ramos, J. M., López García, D., Gómez-Bravo, F. & Blanco Morón, a. (2010), 'Application of multicriteria decision-making techniques to manoeuvre planning in nonholonomic robots', *Expert Systems with Applications* **37**(5), 3962–3976.

Masoud, A. A. (2013), 'A harmonic potential field approach for joint planning and control of a rigid, separable nonholonomic, mobile robot', *Robotics and Autonomous Systems* **61**(6), 593–615.

URL: <http://dx.doi.org/10.1016/j.robot.2013.02.007>



Matveev, A. S., Teimoori, H. & Savkin, A. V. (2011), 'Navigation of a unicycle-like mobile robot for environmental extremum seeking', *Automatica* **47**(1), 85–91.

Meng, B. & Gao, X. (2010), Uav path planning based on bidirectional sparse a* search algorithm, in 'International Conference on Intelligent Computation Technology and Automation (ICICTA)', Vol. 3, pp. 1106–1109.

Michal, K. & Ferková, Z. (2012), Harmonic Potential Field Method for Path Planning of Mobile Robot, in 'International Virtual Conference 2012 (ICTIC 2012) Slovakia', Vol. 1, EDIS - Publishing Institution of the University of Zilina, pp. 41–46.

Michalek, M. & Kozłowski, K. (2010), 'Vector-field-orientation feedback control method for a differentially driven vehicle', *IEEE Transactions on Control Systems Technology* **18**(1), 45–65.

Mo, H. & Xu, L. (2015), 'Neurocomputing Research of biogeography particle swarm optimization for robot path planning', *Neurocomputing* **148**, 91–99.

URL: <http://dx.doi.org/10.1016/j.neucom.2012.07.060>

Montiel, O., Orozco-Rosas, U. & Sepúlveda, R. (2015), 'Path planning for mobile robots using Bacterial Potential Field for avoiding static and dynamic obstacles', *Expert Systems with Applications* **42**(12), 5177–5191.

URL: <http://linkinghub.elsevier.com/retrieve/pii/S0957417415001402>

Mouhcine, E. (2016), An Improved Swarm Optimization Algorithm For Vehicle Path Planning Problem, in 'Information Science and Technology (CiSt), 2016 4th IEEE International Colloquium on', pp. 707–712.

Nehmzow, U. (2001), Mobile Robotics: Research, Applications and Challenges, in 'Proceedings "Future Trends in Robotics", Institution of Mechanical Engineers, London', The University of Manchester, pp. 2–5.

Noormohammadi Asl, A., Menhaj, M. B. & Sajedin, A. (2014), 'Control of leader-follower formation and path planning of mobile robots using Asexual Reproduction Optimization (ARO)', *Applied Soft Computing Journal* **14**, 563–576.

URL: <http://dx.doi.org/10.1016/j.asoc.2013.07.030>

Notes for Lectures 15 and 16 (1996), <https://people.eecs.berkeley.edu/~dennel/cs267/lecture24/lecture24.html>. Accessed: 2017-07-24.

Obermeyer, K. J. (2009), 'Path Planning for a UAV Performing Reconnaissance of Static Ground Targets in Terrain', *AIAA Guidance, Navigation, and Control Conference* pp. 1–10.

P. Raja (2012), 'Optimal path planning of mobile robots: A review', *International Journal of the Physical Sciences* **7**(9), 1314–1320.

Panchal, P. M., Panchal, S. R. & Shah, S. K. (2013), 'A Comparison of SIFT and SURF', *International Journal of Innovative Research in Computer and Communication Engineering* **1**(2), 53–60.



Pehlivanoglu, Y. V. (2012), 'A new vibrational genetic algorithm enhanced with a Voronoi diagram for path planning of autonomous UAV', *Aerospace Science and Technology* **16**(1), 47–55.

URL: <http://dx.doi.org/10.1016/j.ast.2011.02.006>

Ping-Huan, K., Tzue-Hseng S., L., Guan-Yu, C., Ya-Fang, H. & Chih-Jui, L. (2017), 'A migrant-inspired path planning algorithm for obstacle run using particle swarm optimization, potential field navigation, and fuzzy logic controller', *The Knowledge Engineering Review* pp. 1–17.

Qi, Z., Shao, Z., Ping, Y. S., Hiot, L. M. & Leong, Y. K. (2010), 'An improved heuristic algorithm for UAV path planning in 3D environment', *International Conference on Intelligent Human-Machine Systems and Cybernetics, IHMSC* **2**, 258–261.

Qu, H., Xing, K. & Alexander, T. (2013), 'An improved genetic algorithm with co-evolutionary strategy for global path planning of multiple mobile robots', *Neurocomputing* **120**, 509–517.

URL: <http://dx.doi.org/10.1016/j.neucom.2013.04.020>

Qu, Z., Xi, X., Girard, A. & Arbor, A. (2010), 'Cooperative UAV Trajectory Planning with Multiple Dynamic Targets', pp. 1–9.

Quigley, M., Conley, K., Gerkey, B. P., Faust, J., Foote, T., Leibs, J., Wheeler, R. & Ng, A. Y. (2009), Ros: an open-source robot operating system, in 'ICRA Workshop on Open Source Software'.

Raja, R., Dutta, A. & Venkatesh, K. S. (2015), 'New potential field method for rough terrain path planning using genetic algorithm for a 6-wheel rover', *Robotics and Autonomous Systems* **72**, 295–306.

URL: <http://dx.doi.org/10.1016/j.robot.2015.06.002>

Ruchti, J. (2011), 'UAV Collision Avoidance Using Artificial Potential Fields Technical Report # CSSE11', pp. 1–21.

Sezer, V. & Gokasan, M. (2012), 'A novel obstacle avoidance algorithm: "Follow the gap method"', *Robotics and Autonomous Systems* **60**(9), 1123–1134.

URL: <http://dx.doi.org/10.1016/j.robot.2012.05.021>

Sfeir, J., Saad, M. & Saliah-Hassane, H. (2011), An improved artificial potential field approach to real-time mobile robot path planning in an unknown environment, in 'Robotic and Sensors Environments (ROSE), 2011 IEEE International Symposium on', pp. 208–213.

Sgorbissa, A. & Zaccaria, R. (2012), 'Planning and obstacle avoidance in mobile robotics', *Robotics and Autonomous Systems* **60**(4), 628–638.

URL: <http://dx.doi.org/10.1016/j.robot.2011.12.009>

Shanmugavel, M. (2007), Path Planning of Multiple Autonomous Vehicles, PhD thesis, Cranfield University.



- Shanmugavel, M., Tsourdos, A. & White, B. A. (2010), Collision avoidance and path planning of multiple UAVs using flyable paths in 3D, in '15th International Conference on Methods and Models in Automation and Robotics, MMAR', pp. 218–222.
- Shanmugavel, M., Tsourdos, A., White, B. & Zbikowski, R. (2010), 'Co-operative path planning of multiple UAVs using Dubins paths with clothoid arcs', *Control Engineering Practice* **18**(9), 1084–1092.
- Siegwart, R. & Nourbakhsh, I. R. (2004), *Introduction to Autonomous Mobile Robots*, Vol. 23, The MIT Press.
- Soltani, a. R., Tawfik, H., Goulermas, J. Y. & Fernando, T. (2002), 'Path planning in construction sites: Performance evaluation of the dijkstra, a*, and GA search algorithms', *Advanced Engineering Informatics* **16**(2002), 291–303.
- Tang, L., Dian, S., Gu, G., Zhou, K., Wang, S. & Feng, X. (2010), A novel potential field method for obstacle avoidance and path planning of mobile robot, in 'Computer Science and Information Technology (ICCSIT), 2010 3rd IEEE International Conference on', Vol. 9, pp. 633–637.
- Tomic, T., Schmid, K., Lutz, P., Domel, A., Kassecker, M., Mair, E., Grixia, I., Ruess, F., Suppa, M. & Burschka, D. (2012), 'Toward a fully autonomous UAV: Research platform for indoor and outdoor urban search and rescue', *IEEE Robotics and Automation Magazine* **19**(3), 46–56.
- Triharminto, H. H., Prabuwo, A., Adji, T. B. & Setiawan, N. A. (2013), 'Adaptive dynamic path planning algorithm for interception of a moving target', *Int. J. Mob. Comput. Multimed. Commun.* **5**(3), 19–33.
URL: <http://dx.doi.org/10.4018/jmcmc.2013070102>
- Tuncer, A. & Yildirim, M. (2012), 'Dynamic path planning of mobile robots with improved genetic algorithm', *Computers and Electrical Engineering* **38**(6), 1564–1572.
URL: <http://dx.doi.org/10.1016/j.compeleceng.2012.06.016>
- Urakubo, T. (2015), 'Feedback stabilization of a nonholonomic system with potential fields: application to a two-wheeled mobile robot among obstacles', *Nonlinear Dynamics* **81**(3), 1475–1487.
- Urakubo, T., Okuma, K. & Tada, Y. (2004), 'Feedback control of a two wheeled mobile robot with obstacle avoidance using potential functions', *2004 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) (IEEE Cat. No.04CH37566)* **3**, 2428–2433.
- Walter, M. R. (2008), *Sparse Bayesian Information Filters for Localization and Mapping*, PhD thesis, Massachusetts Institute of Technology.
- Wang, G., Li, Q. & Guo, L. (2010), 'Multiple UAVs Routes Planning Based on Particle Swarm Optimization Algorithm', *2nd International Symposium on Information Engineering and Electronic Commerce* pp. 1–5.
URL: <http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=5533230>

- Wang, H., Lyu, W., Yao, P., Liang, X. & Liu, C. (2015), 'Three-dimensional path planning for unmanned aerial vehicle based on interfered fluid dynamical system', *Chinese Journal of Aeronautics* **28**(1), 229–239.
URL: <http://dx.doi.org/10.1016/j.cja.2014.12.031>
- Wang, M., Su, Z., Tu, D. & Lu, X. (2013), A Hybrid Algorithm Based on Artificial Potential Field and BUG for Path Planning of Mobile Robot, in '2013 International Conference on Measurement, Information and Control (ICMIC)', pp. 1393–1398.
- Wang, X. & Ju, Y. (2015), Application of Stream Function Method in Local Route Planning for UUV's, in 'International Industrial Informatics and Computer Engineering Conference (IIICEC 2015) Application', pp. 1746–1749.
- Weerakoon, T., Ishii, K. & Nassiraei, A. A. F. (2015), 'An Artificial Potential Field Based Mobile Robot Navigation Method To Prevent From Deadlock', *Journal of Artificial Intelligence and Soft Computing Research* **5**(3), 189–203.
- Whitley, D. (1994), 'A genetic algorithm tutorial', *Statistics and computing* **4**(2), 65–85.
- Wilt, C., Thayer, J. & Ruml, W. (2010), 'A comparison of greedy search algorithms', *Proceedings of the Third Annual Symposium on Combinatorial Search* pp. 129–136.
URL: <http://www.aaai.org/ocs/index.php/SOCS/SOCS10/paper/view/2101@misc>
- Xie, L., Chen, H. & Xie, G. (2007), *Artificial Potential Field Based Path Planning for Mobile Robots Using Virtual Water-Flow Method*, Vol. 2, Springer Berlin Heidelberg.
- Xuan Zou, Bin Ge, P. S. (2012), 'Improved Genetic Algorithm for Dynamic Path Planning', *International Journal of Information and Computer Science IJICS* **1**(2), 16–20.
- Yao, Z. Y. Z. & Ma, L. M. L. (2010), 'A Static Environment-Based Path Planning Method by Using Genetic Algorithm', *Computing, Control and Industrial Engineering (CCIE), 2010 International Conference on* **2**, 405–407.
- Yong, C. Y. C. & Barth, E. (2006), 'Real-time Dynamic Path Planning for Dubins' Nonholonomic Robot', *Proceedings of the 45th IEEE Conference on Decision and Control* pp. 2418–2423.
- Zhang, Q., Chen, D. & Chen, T. (2012), 'An Obstacle Avoidance Method of Soccer Robot Based on Evolutionary Artificial Potential Field', *Energy Procedia* **16**, 1792–1798.
- Zhang, X., Chen, J., Xin, B. & Fang, H. (2011), Online path planning for UAV using an improved differential evolution algorithm, in 'IFAC Proceedings Volumes', Vol. 18, pp. 6349–6354.
- Zhangqi, W., Xiaoguang, Z. & Qingyao, H. (2011), 'Mobile Robot Path Planning based on Parameter Optimization Ant Colony Algorithm', *Procedia Engineering* **15**, 2738–2741.