

# Generalized velocity obstacle algorithm for preventing

Ocean Engineering

173, 142-156

DOI: [10.1016/j.oceaneng.2018.12.053](https://doi.org/10.1016/j.oceaneng.2018.12.053)

Citation Report

#	ARTICLE	IF	CITATIONS
1	Distributed Model Predictive Control for cooperative floating object transport with multi-vessel systems. <i>Ocean Engineering</i> , 2019, 191, 106515.	1.9	29
2	Optimizing the joint collision avoidance operations of multiple ships from an overall perspective. <i>Ocean Engineering</i> , 2019, 191, 106511.	1.9	18
3	Review of maritime traffic models from vessel behavior modeling perspective. <i>Transportation Research Part C: Emerging Technologies</i> , 2019, 105, 323-345.	3.9	39
4	Probabilistic risk analysis for ship-ship collision: State-of-the-art. <i>Safety Science</i> , 2019, 117, 108-122.	2.6	153
5	Time-varying Risk Measurement for Ship Collision Prevention. <i>Risk Analysis</i> , 2020, 40, 24-42.	1.5	48
6	Ship collision avoidance methods: State-of-the-art. <i>Safety Science</i> , 2020, 121, 451-473.	2.6	248
7	Cooperative Multi-Vessel Systems in Urban Waterway Networks. <i>IEEE Transactions on Intelligent Transportation Systems</i> , 2020, 21, 3294-3307.	4.7	43
8	An improved time discretized non-linear velocity obstacle method for multi-ship encounter detection. <i>Ocean Engineering</i> , 2020, 196, 106718.	1.9	36
9	A collision avoidance decision-making system for autonomous ship based on modified velocity obstacle method. <i>Ocean Engineering</i> , 2020, 215, 107910.	1.9	71
10	A COLREG-compliant ship collision alert system for stand-on vessels. <i>Ocean Engineering</i> , 2020, 218, 107866.	1.9	33
11	Ship collision avoidance anthropomorphic decision-making for structured learning based on AIS with Seq-CGAN. <i>Ocean Engineering</i> , 2020, 217, 107922.	1.9	28
12	On the Use of the Hybrid Causal Logic Methodology in Ship Collision Risk Assessment. <i>Journal of Marine Science and Engineering</i> , 2020, 8, 485.	1.2	15
13	A ship collision avoidance system for human-machine cooperation during collision avoidance. <i>Ocean Engineering</i> , 2020, 217, 107913.	1.9	46
14	Research on ontology-based situation understanding and decision-making approach for MASS. <i>IOP Conference Series: Materials Science and Engineering</i> , 2020, 929, 012029.	0.3	1
15	Improving stand-on ship's situational awareness by estimating the intention of the give-way ship. <i>Ocean Engineering</i> , 2020, 201, 107110.	1.9	60
16	Fuzzy logic based dynamic decision-making system for intelligent navigation strategy within inland traffic separation schemes. <i>Ocean Engineering</i> , 2020, 197, 106909.	1.9	82
17	Collision risk measure for triggering evasive actions of maritime autonomous surface ships. <i>Safety Science</i> , 2020, 127, 104708.	2.6	48
18	Survey on Cooperative Control for Waterborne Transport. <i>IEEE Intelligent Transportation Systems Magazine</i> , 2021, 13, 71-90.	2.6	16

#	ARTICLE	IF	CITATIONS
19	Moving obstacle avoidance for cable-driven parallel robots using improved RRT. <i>Microsystem Technologies</i> , 2021, 27, 2281-2292.	1.2	6
20	Deep learning structure for collision avoidance planning of unmanned surface vessel. <i>Proceedings of the Institution of Mechanical Engineers Part M: Journal of Engineering for the Maritime Environment</i> , 2021, 235, 511-520.	0.3	2
21	A novel real-time collision risk awareness method based on velocity obstacle considering uncertainties in ship dynamics. <i>Ocean Engineering</i> , 2021, 220, 108436.	1.9	59
22	Directional optimal reciprocal collision avoidance. <i>Robotics and Autonomous Systems</i> , 2021, 136, 103705.	3.0	9
23	Monitoring of the process of safe divergence on the part of an unmanned vessel. <i>E3S Web of Conferences</i> , 2021, 244, 08012.	0.2	1
24	Cooperative collision avoidance for unmanned surface vehicles based on improved genetic algorithm. <i>Ocean Engineering</i> , 2021, 222, 108612.	1.9	26
25	Analysis of a practical method for estimating the ship's best possible speed when passing under bridges or other suspended obstacles. <i>Ocean Engineering</i> , 2021, 225, 108790.	1.9	4
26	Comparison between the collision avoidance decision-making in theoretical research and navigation practices. <i>Ocean Engineering</i> , 2021, 228, 108881.	1.9	29
27	Dynamic Obstacle Avoidance of Mobile Robot Based on Adaptive Velocity Obstacle. , 2021, , .		5
28	Modified Vector Field Path-Following Control System for an Underactuated Autonomous Surface Ship Model in the Presence of Static Obstacles. <i>Journal of Marine Science and Engineering</i> , 2021, 9, 652.	1.2	20
29	Geometrical risk evaluation of the collisions between ships and offshore installations using rule-based Bayesian reasoning. <i>Reliability Engineering and System Safety</i> , 2021, 210, 107474.	5.1	44
30	On the use of leading safety indicators in maritime and their feasibility for Maritime Autonomous Surface Ships. <i>Proceedings of the Institution of Mechanical Engineers, Part O: Journal of Risk and Reliability</i> , 2023, 237, 314-331.	0.6	12
31	A Real-Time Collision Avoidance Framework of MASS Based on B-Spline and Optimal Decoupling Control. <i>Sensors</i> , 2021, 21, 4911.	2.1	10
32	An Optimized Collision Avoidance Decision-Making System for Autonomous Ships under Human-Machine Cooperation Situations. <i>Journal of Advanced Transportation</i> , 2021, 2021, 1-17.	0.9	8
33	An application-orientated anti-collision path planning algorithm for unmanned surface vehicles. <i>Ocean Engineering</i> , 2021, 235, 109298.	1.9	19
34	Survey on hydrodynamic effects on cooperative control of Maritime Autonomous Surface Ships. <i>Ocean Engineering</i> , 2021, 235, 109300.	1.9	10
35	Collision-avoidance navigation systems for Maritime Autonomous Surface Ships: A state of the art survey. <i>Ocean Engineering</i> , 2021, 235, 109380.	1.9	101
36	A concept of critical safety area applicable for an obstacle-avoidance process for manned and autonomous ships. <i>Reliability Engineering and System Safety</i> , 2021, 214, 107806.	5.1	46

#	ARTICLE	IF	CITATIONS
37	Multi-ship encounter situation adaptive understanding by individual navigation intention inference. Ocean Engineering, 2021, 237, 109612.	1.9	22
38	A probabilistic risk approach for the collision detection of multi-ships under spatiotemporal movement uncertainty. Reliability Engineering and System Safety, 2021, 215, 107772.	5.1	31
39	COLREGS-based Path Planning for Ships at Sea Using Velocity Obstacles. IEEE Access, 2021, 9, 32613-32626.	2.6	21
40	Local Collision Avoidance Algorithm for a Unmanned Surface Vehicle Based on Steering Maneuver Considering COLREGs. IEEE Access, 2021, 9, 49233-49248.	2.6	8
41	Principles of Interaction of Agents During Cooperative Maneuvering of Unmanned Vessels. Advances in Intelligent Systems and Computing, 2021, , 442-452.	0.5	3
42	Collision Avoidance Systems for Maritime Autonomous Surface Ships Considering Uncertainty in Ship Dynamics. IFAC-PapersOnLine, 2020, 53, 14614-14619.	0.5	2
43	AUTOMATIC COLLISION AVOIDANCE WITH MULTIPLE TARGETS, INCLUDING MANEUVERING ONES. RadÄoelektronika, ÄEnformatika, UpravlÄnnÄ, 2019, .	0.1	11
44	Marine traffic profile for enhancing situational awareness based on complex network theory. Ocean Engineering, 2021, 241, 110049.	1.9	11
45	Measuring Ship Collision Risk in a Dense Traffic Environment. TransNav, 2019, 13, 737-744.	0.3	2
46	A Coordination System between Decision Making and Controlling for Autonomous Collision Avoidance of Large Intelligent Ships. Journal of Marine Science and Engineering, 2021, 9, 1202.	1.2	21
47	Vehicle Safety of the Velocity Obstacle Algorithm. , 2020, , .		3
48	Conflict detection method based on dynamic ship domain model for visualization of collision risk Hot-Spots. Ocean Engineering, 2021, 242, 110143.	1.9	29
49	Intent Inference-Based Ship Collision Avoidance in Encounters With Rule-Violating Vessels. IEEE Robotics and Automation Letters, 2022, 7, 518-525.	3.3	6
51	On the Verification and Validation of AI Navigation Algorithms. , 2020, , .		5
52	MPC-based COLREGS Compliant Collision Avoidance for a Multi-Vessel Ship-Towing System. , 2021, , .		9
53	Reactive Collision Avoidance for Underactuated Surface Vehicles using the Collision Cone Concept. , 2021, , .		2
54	Review of Ship Behavior Characteristics in Mixed Waterborne Traffic. Journal of Marine Science and Engineering, 2022, 10, 139.	1.2	3
55	Multi-Stage and Multi-Topology Analysis of Ship Traffic Complexity for Probabilistic Collision Detection. SSRN Electronic Journal, 0, , .	0.4	0

#	ARTICLE	IF	CITATIONS
56	Dynamic anti-collision A-star algorithm for multi-ship encounter situations. <i>Applied Ocean Research</i> , 2022, 118, 102995.	1.8	64
57	Uncertain moving obstacles avoiding method in 3D arbitrary path planning for a spherical underwater robot. <i>Robotics and Autonomous Systems</i> , 2022, 151, 104011.	3.0	31
58	Node importance evaluation in marine traffic situation complex network for intelligent maritime supervision. <i>Ocean Engineering</i> , 2022, 247, 110742.	1.9	25
59	Group movement of UAVs in environment with dynamic obstacles: a survey. <i>International Journal of Intelligent Unmanned Systems</i> , 2022, ahead-of-print, .	0.6	3
60	Framework and application of multi-criteria ship collision risk assessment. <i>Ocean Engineering</i> , 2022, 250, 111006.	1.9	12
61	A review of path planning algorithms in maritime autonomous surface ships: Navigation safety perspective. <i>Ocean Engineering</i> , 2022, 251, 111010.	1.9	57
62	Local Route Planning for Collision Avoidance of Maritime Autonomous Surface Ships in Compliance with COLREGs Rules. <i>Sustainability</i> , 2022, 14, 198.	1.6	16
63	Intelligent Ship Collision Avoidance Algorithm Based on DDQN with Prioritized Experience Replay under COLREGs. <i>Journal of Marine Science and Engineering</i> , 2022, 10, 585.	1.2	29
64	Automatic traffic scenarios generation for autonomous ships collision avoidance system testing. <i>Ocean Engineering</i> , 2022, 254, 111309.	1.9	18
65	A COLREGs-compliant guidance strategy for an underactuated unmanned surface vehicle combining potential field with grid map. <i>Ocean Engineering</i> , 2022, 255, 111355.	1.9	13
66	An improved real-time collision-avoidance algorithm based on Hybrid A* in a multi-object-encountering scenario for autonomous surface vessels. <i>Ocean Engineering</i> , 2022, 255, 111406.	1.9	4
67	The synergy of the multi-modal MPC and Q-learning approach for the navigation of a three-wheeled omnidirectional robot based on the dynamic model with obstacle collision avoidance purposes. <i>Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science</i> , 2022, 236, 9716-9729.	1.1	1
68	Multi-ship collision avoidance decision-making and coordination mechanism in Mixed Navigation Scenarios. <i>Ocean Engineering</i> , 2022, 257, 111666.	1.9	26
69	A COLREGs-Compliant Collision Avoidance Decision Approach Based on Deep Reinforcement Learning. <i>Journal of Marine Science and Engineering</i> , 2022, 10, 944.	1.2	9
70	Agile collision avoidance for unmanned surface vehicles based on collision shielded model prediction control algorithm. <i>Journal of Navigation</i> , 2022, 75, 1243-1267.	1.0	1
71	COLREGS-Compliant collision avoidance for physically coupled multi-vessel systems with distributed MPC. <i>Ocean Engineering</i> , 2022, 260, 111917.	1.9	14
72	Towards real-time ship collision risk analysis: An improved R-TCR model considering target ship motion uncertainty. <i>Reliability Engineering and System Safety</i> , 2022, 226, 108650.	5.1	8
73	Cooperative collision avoidance study of Maritime Autonomous Surface Ship. , 2021, , .		2

#	ARTICLE	IF	CITATIONS
74	Research on Collision Avoidance of Multiple Ships Based on Fuzzy Ship Domain Model. , 2021, , .		0
75	Collision Avoidance Decision Method for Unmanned Surface Vehicle Based on an Improved Velocity Obstacle Algorithm. Journal of Marine Science and Engineering, 2022, 10, 1047.	1.2	3
76	Sampling-based collision and grounding avoidance for marine crafts. Ocean Engineering, 2022, 261, 112078.	1.9	3
77	USV compliant obstacle avoidance based on dynamic two ship domains. Ocean Engineering, 2022, 262, 112257.	1.9	7
78	A real-time ship collision risk perception model derived from domain-based approach parameters. Ocean Engineering, 2022, 265, 112554.	1.9	5
79	Multi-stage and multi-topology analysis of ship traffic complexity for probabilistic collision detection. Expert Systems With Applications, 2023, 213, 118890.	4.4	9
80	USV Dynamic Accurate Obstacle Avoidance Based on Improved Velocity Obstacle Method. Electronics (Switzerland), 2022, 11, 2720.	1.8	6
81	Distributed-integrated model predictive control for cooperative operation with multi-vessel systems. Journal of Marine Science and Technology, 0, , .	1.3	0
82	Intelligent Collision Avoidance Method for Ships Based on COLRGEs and Improved Velocity Obstacle Algorithm. Applied Sciences (Switzerland), 2022, 12, 8926.	1.3	8
83	Collision Avoidance Method for Autonomous Ships Based on Modified Velocity Obstacle and Collision Risk Index. Journal of Advanced Transportation, 2022, 2022, 1-22.	0.9	1
84	Path-following and LiDAR-based obstacle avoidance via NMPC for an autonomous surface vehicle. Ocean Engineering, 2022, 266, 112900.	1.9	12
85	Survey on Cooperative Collision Avoidance Research for Ships. IEEE Transactions on Transportation Electrification, 2023, 9, 3012-3025.	5.3	3
86	Critical Collision Risk Index Based on the Field Theory. Journal of Marine Science and Engineering, 2022, 10, 1748.	1.2	2
87	A deterministic collision avoidance decision-making system for multi-MASS encounter situation. Ocean Engineering, 2022, 266, 113087.	1.9	5
88	Research on Collision Avoidance Algorithm of Unmanned Surface Vehicle Based on Deep Reinforcement Learning. IEEE Sensors Journal, 2023, 23, 11262-11273.	2.4	5
89	Real-Time Emergency Collision Avoidance for Unmanned Surface Vehicles with COLREGS Flexibly Obeyed. Journal of Marine Science and Engineering, 2022, 10, 2025.	1.2	2
90	A review on COLREGs-compliant navigation of autonomous surface vehicles: From traditional to learning-based approaches. , 2022, 1, 100003.		3
91	Collision risk-informed weather routing for sailboats. Reliability Engineering and System Safety, 2023, 232, 109015.	5.1	7

#	ARTICLE	IF	CITATIONS
92	The Vagueness of COLREG versus Collision Avoidance Techniquesâ€”A Discussion on the Current State and Future Challenges Concerning the Operation of Autonomous Ships. Sustainability, 2022, 14, 16516.	1.6	9
93	COLREGS-based collision avoidance algorithm for unmanned surface vehicles using modified artificial potential fields. Physical Communication, 2023, 57, 101980.	1.2	12
94	Requirements for Optimal Local Route Planning of Autonomous Ships. Journal of Marine Science and Engineering, 2023, 11, 17.	1.2	6
95	Development of ship collision avoidance system and sea trial test for autonomous ship. Ocean Engineering, 2022, 266, 113120.	1.9	14
96	An Improved Bald Eagle Search Algorithm for Global Path Planning of Unmanned Vessel in Complicated Waterways. Journal of Marine Science and Engineering, 2023, 11, 118.	1.2	5
97	Research on ship collision avoidance path planning based on modified potential field ant colony algorithm. Ocean and Coastal Management, 2023, 235, 106482.	2.0	14
98	Application of an Automotive Assurance Case Approach to Autonomous Marine Vessel Security. , 2022, , .		0
99	A review on the progress and research directions of ocean engineering. Ocean Engineering, 2023, 272, 113617.	1.9	35
100	Ship Autonomous Collision-Avoidance Strategiesâ€”A Comprehensive Review. Journal of Marine Science and Engineering, 2023, 11, 830.	1.2	11
101	Regulation aware dynamic path planning for intelligent ships with uncertain velocity obstacles. Ocean Engineering, 2023, 278, 114401.	1.9	5
102	A novel maritime autonomous navigation decision-making system: Modeling, integration, and real ship trial. Expert Systems With Applications, 2023, 222, 119825.	4.4	11
103	A distributed coordinated path planning algorithm for maritime autonomous surface ship. Ocean Engineering, 2023, 271, 113759.	1.9	6
104	Ship behavior during encounters in ports and waterways based on AIS data: From theoretical definitions to empirical findings. Ocean Engineering, 2023, 272, 113879.	1.9	5
105	Can Genetic Algorithms Be Used for Real-Time Obstacle Avoidance for LiDAR-Equipped Mobile Robots?. Sensors, 2023, 23, 3039.	2.1	4
106	Research on MASS Collision Avoidance in Complex Waters Based on Deep Reinforcement Learning. Journal of Marine Science and Engineering, 2023, 11, 779.	1.2	1
107	An energy-efficient hierarchical algorithm of dynamic obstacle avoidance for unmanned surface vehicle. International Journal of Naval Architecture and Ocean Engineering, 2023, 15, 100528.	1.0	2
108	A real-time multi-ship collision avoidance decision-making system for autonomous ships considering ship motion uncertainty. Ocean Engineering, 2023, 278, 114205.	1.9	8
109	Influence of external conditions on the ship dynamics model during maneuvering. AIP Conference Proceedings, 2023, , .	0.3	0

#	ARTICLE	IF	CITATIONS
112	Decision Model of Ship Intelligent Collision Avoidance Based on Automatic Information System Data and Generic Adversary Imitation Learning-Deep Deterministic Policy Gradient. , 2023, , .		0
115	Research on Path Planning Method of Unmanned Boat Based on Improved Artificial Potential Field Method. , 2022, , .		0
123	COLREGs-compliant autonomous collision avoidance method based on deep reinforcement learning for USVs. , 2023, , .		0
124	Trigger event(s) identification for switching operational mode of Maritime Autonomous Surface Ships. , 2023, , .		0