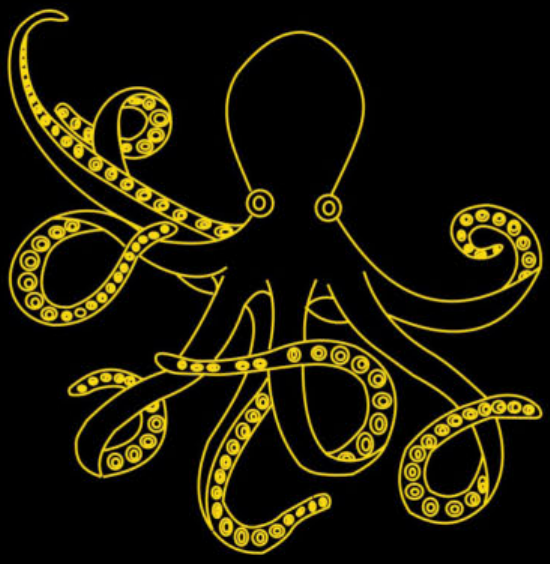

Diving & ROV specialists

Index for document research

Papers on underwater mapping techniques stored in the website database

September 2024

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Purpose

This document lists the papers on ***"Underwater Mapping Techniques"*** archived in the relevant section of the "Diving and ROV Specialists" website database.
Its purpose is to serve as a supplementary resource for research to the chronological list and search engine capabilities. For this reason, the various documents are categorized under the following sub-sections:

- Overview presentations of various systems
- Acoustic imaging
- Image treatment
- Positioning & localization
- Autonomous systems (including robotics design & artificial intelligence programs)

Categorizations will be refined over time. However, it is impractical to provide search engines and classifications that fully reflect researchers' preferences. Therefore, it is hoped that these three search methods will enable you to find the documents you seek.

Unlike the website's chronological index, this document does not include descriptions of the content of the various papers. However, the chronological classification number, authors' names, and publication dates are available, allowing you to locate them in the chronological lists where the descriptions and download links are provided.

This list was published on 1 September 2024. Please note that new documents added for this edition of the website are listed for each main section on the home page of the website.

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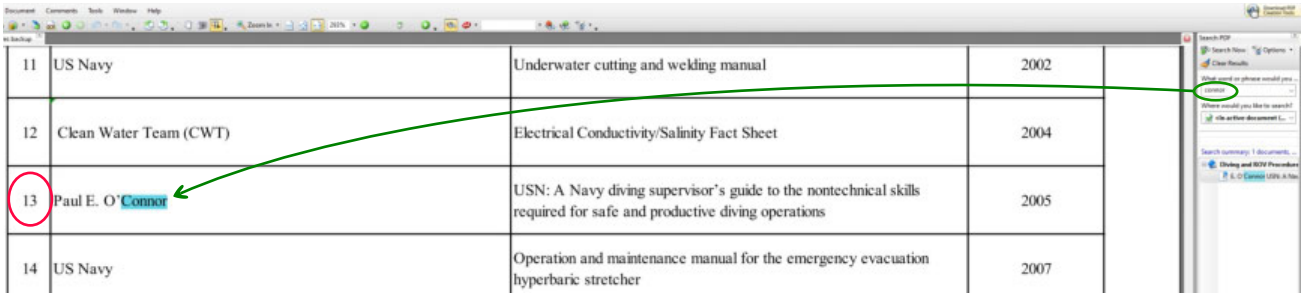
Important note:

This document is in PDF (Portable Document Format), so it can be downloaded and used independently of the website. It is also worth noting that some PDF readers come with a built-in search engine. This feature allows users to locate specific documents by entering relevant keywords, making document retrieval more efficient and convenient. It is, therefore, possible to find the desired document by browsing the list or by using the aforementioned search engine. Among the many free PDF readers available on the Internet, the four listed below include the aforementioned search engine:

- WPS Office (https://www.wps.com/) - works on Windows, Mac OS, and Linux
- PDF X Change Viewer (https://pdf-xchange.eu/pdf-xchange-editor/index.htm) - Works on Windows and Mac OS.
- Foxit Reader (https://www.foxit.com/pdf-reader/) - Works on Windows, Linux , and Mac OS
- Adobe Acrobat Reader (https://get.adobe.com/reader/) - Works on Windows and Mac Os.

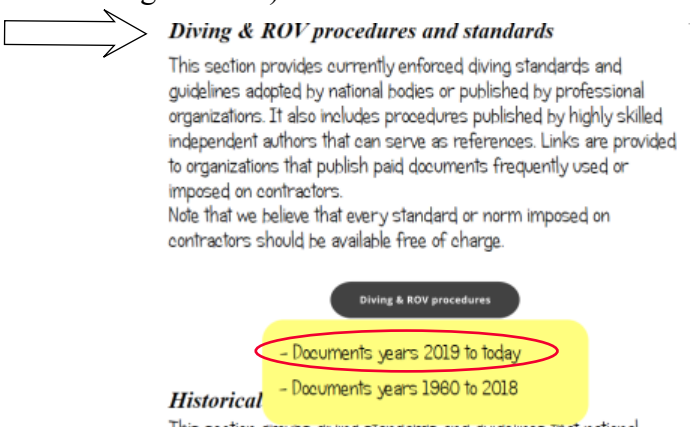
To locate a document within the chronological presentation of the database:

1. Follow the list and select the desired document, or use the search function of the PDF software by entering the keyword in the dedicated field. In this example, the author's name (Paul E. O'Connor) has been used.

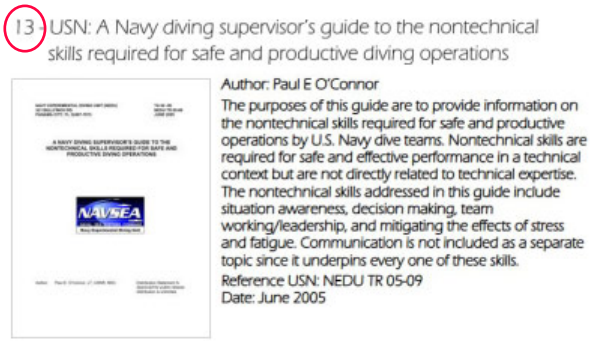


11	US Navy	Underwater cutting and welding manual	2002
12	Clean Water Team (CWT)	Electrical Conductivity/Salinity Fact Sheet	2004
13	Paul E. O'Connor	USN: A Navy diving supervisor's guide to the nontechnical skills required for safe and productive diving operations	2005
14	US Navy	Operation and maintenance manual for the emergency evacuation hyperbaric stretcher	2007

2. Select the reference number (highlighted in red) and the year of publication (2005 in this example).
3. On the website, open the corresponding section and year of publication in the database (accessible via "Documents" in the navigation bar).



4. Scroll down to find the corresponding number, title, and author's name in the chronological list. Click on the picture or the description, and enjoy.



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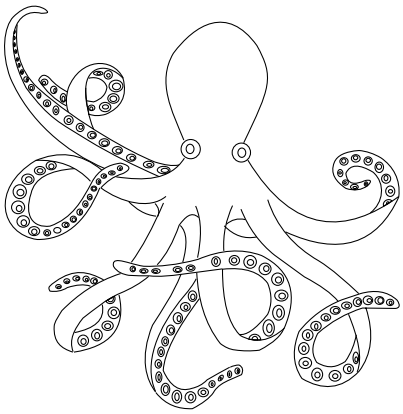
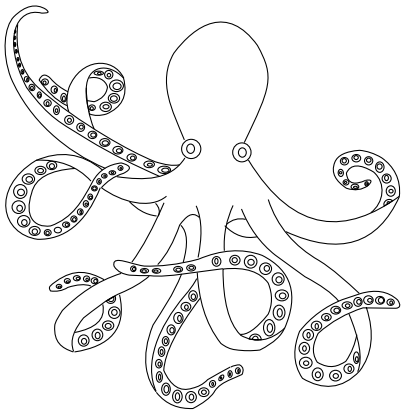
Overview presentations of various systems



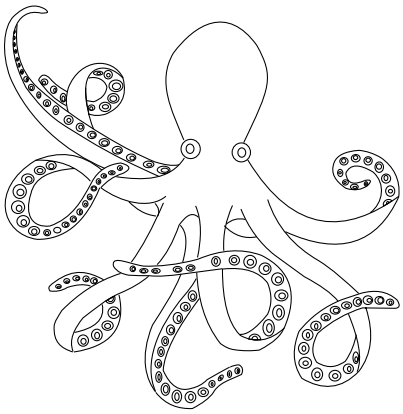
Nb	Authors	Title	Year publication
1989 - 2021			
1	John O. Klepsvik, & Hans Olav Torsen	Recent Advances in Accurate Underwater Mapping and Inspection Techniques	1989
3	M Vacchi, A Rovere, V Parravicini, M Firpo, & 2 other scientists	Bringing geoheritage underwater mapping in the shallow water	2008
11	Emily J. Chua, William Savidge, R. Timothy Short, Andres M. Cardenas-Valencia, and Robinson W. Fulweiler.	A Review of the Emerging Field of Underwater Mass Spectrometry	2016
20	Manish Mathnikar, & Uday Patkar	Underwater Bed Profile Generation	2020
35	Kai Sun, Weicheng Cui, & Chi Chen	Review of Underwater Sensing Technologies and Applications	2021
2022 - Now			
2	Xiaotian Han, Peng Li, Chang Chang, Duorui Gao, & 4 scientists	A Comprehensive Comparison and Analysis of Several Intensity Modulations Based on the Underwater Photon-Counting Communication System	2022
9	Changho Yun	An Underwater Cooperative Spectrum Sharing Protocol for a Centralized Underwater Cognitive Acoustic Network	2022
17	Aslanbek Naziev	On the independence of conditions in the definition of linear mapping	2022
18	Tuochao Chen, Justin Chan, & Shyamnath Gollakota	Underwater Acoustic Ranging Between Smartphones	2022
37	Xuanyao Bai, Kailun Wen, Donghong Peng, Shuangqiang Liu, & Le Luo	Atomic magnetometers and their application in industry	2023
40	Shaowei Zhang, & Zhiqun Daniel Deng	Editorial: Deep-sea observation equipment and exploration technology	2023-09

Acoustic imaging



Nb	*Authors*	*Title*	*Year publication*
1989 - 2021			
2	Mark Rognstad	HAWAII MR1: A New Underwater Mapping Tool	1992
8	Alistair Dobke, Joshua Vasquez, Lauren Lieu, Ben Chasnov, & 3 other scientists	Towards three-dimensional underwater mapping without odometry	2013
10	Antoni Burguera, & Gabriel Oliver	High-Resolution Underwater Mapping Using Side-Scan Sonar	2016
16	Hendra Kurnia Febriawan	The Preliminary Assessment of Reson Hydrobat Multibeam Echosounder for Seabed and Underwater Structures Mapping Under the Pier	2018
21	Raihanah Rusmadi, & Rozaimi Che Hasan	Performance of different classifiers for marine habitat mapping using side-scan sonar and object-based image analysis	2020
23	Vijaya Baskar Veeriayan, V. Rajendran	Underwater Ambient Noise	2020
25	Joonas Syrjälä, Risto Kalliola, & Jukka Pajala	Underwater Acoustic Environment of Coastal Sea With Heavy shipping Traffic: NE Baltic Sea During Wintertime	2020
28	B. Chemisky, E. Nocerino, F. Menna, M.M. Nawaf, & P. Drap	A portable opto-acoustic survey solution for mapping of underwater targets	2021
29	Zhengliang Hu, Jinxing Huang, Pan Xu, Mingxing Nan, & 2 scientists	Underwater Acoustic Source Localization via Kernel Extreme Learning Machine	2021
2022 - Now			
13	Serkan Aksoy	Fundamentals of underwater acoustics	2022
16	Hong-Gi Kim, Jungmin Seo, & Soo Mee Kim	Underwater Optical-Sonar Image Fusion Systems	2022
19	Zhenjing Zhu, Ning Hu, Junyi Wu, Wenxin Li, & 5 scientists	A review of underwater acoustic metamaterials for underwater acoustic equipment.	2022
20	Denis V. Makarov, & Leonid E. Konkov	Angular Spectrum of Acoustic Pulses at Long Ranges.	2022
22	Shijie Xu, Rendong Feng, Pan Xu, Zhengliang Hu, Haocai Huang, and Guangming Li	Flow current field observation with underwater moving acoustic tomography	2023
34	Xuebo Zhang , Haixin Sun, & Arata Kaneko	Editorial: Ocean observation based on underwater acoustic technology	2023-06

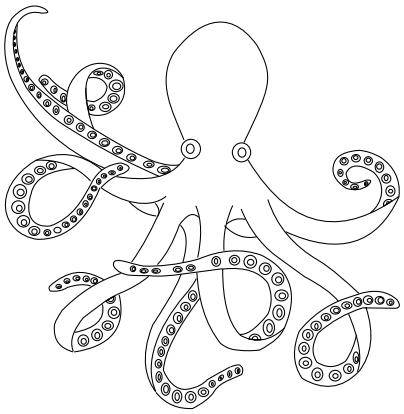
Image treatment



Nb	Authors	Title	Year publication
1989 - 2021			
4	Silvia Silva da Costa Botelho, Paulo Drews Jr, & Gabriel Leivas	A new approach for Visual Underwater Mapping using Topological Shell Maps	2009
5	Armagan Elibol, Nuno Gracias, Rafael Garcia, Art Gleason, & 3 other scientists	Effificient Image Mosaicing for Optical Underwater Mapping	2012
14	Ricard Campos, & Rafael Garcia	Surface meshing of underwater maps from highly defective point sets	2017
17	E. Nocerino, F. Menna, B. Chemisky, & P. Drap	3d sequential mosaicing for underwater navigation and mapping	2020
18	Agung Budi Cahyono, Andreas Catur Wibisono, Dian Saptarini, Rizki Indra Permadi, & 2 other scientists	Underwater Photogrammetry Application for Coral Reef Mapping and Monitoring	2020
22	Yuliang Li, Mingliang Chen, Yuliang qi, Jinquan qi, & 8 scientists	A study of the limits of imaging capability due to water scattering effects in underwater ghost imaging	2020
24	Bohan Liu, Zhaojun Liu, Shaojie Men, Yongfu Li, & 2 other scientists	Underwater Hyperspectral Imaging Technology and Its Applications for Detecting and Mapping the Seafloor: A Review	2020
26	Chloe A. Game, & Michael B. Thompson	Weibull tone mapping for underwater imagery	2020
30	Qi Zhao, Zhichao Xin, Zhibin Yu, & Bing Zheng	Unpaired Underwater Image Synthesis with a Disentangled Representation for Underwater Depth Map Prediction	2021
31	F Muhammad, Poerbandono, & H Sternberg	Controlled experiment of underwater vision-based mapping: A preliminary evaluation	2021
32	A A Timoshenko, A V Zuev, & E S Mursalimov	Algorithm of Dynamic Forming One Whole Raster Photo Map of the Seabed During its Shooting by an Autonomous Uninhabited Underwater Vehicle	2021
33	Chloe A. Game, Michael B. Thompson, & Graham D. Finlayson	Chromatic weibull tone mapping for underwater image enhansement	2021
37	Daniele Ventura, Luca Castoro, Gianluca Mancini, Edoardo Casoli, & 3 other scientists	High spatial resolution underwater data for mapping seagrass transplantation: A powerful tool for visualization and analysis	2021
41	Qi Zhao, Ziqiang Zheng, Huimin Zeng, Zhibin Yu, & 2 scientists	The Synthesis of Unpaired Underwater Images for Monocular Underwater Depth Prediction	2021
42	Gillian S. L. Rowan, Margaret Kalacska, Deep Inamdar, J. Pablo Arroyo-Mora, and Raymond Soffer	Multi-Scale Spectral Separability of Submerged Aquatic Vegetation Species in a Freshwater Ecosystem	2021
43	Jarina Raihan A., P.G. Emeroylariffion Abas, & Liyanage C. De Silva	Restoration of underwater images using depth and transmission map estimation, with attenuation priors	2021
2022 - Now			
1	Xu Liu, Sen Lin, & Zhiyong Tao	Learning multiscale pipeline gated fusion for underwater image enhancement	2022
5	Natalie Summers, Geir Johnsen, Aksel Mogstad, Håvard Løvås, & 2 scientists	Underwater Hyperspectral Imaging of Arctic Macroalgal Habitats during the Polar Night Using a Novel Mini-ROV-UHI Portable System	2022
10	Yaofeng Xie, Zhibin Yu, Xiao Yu, & Bing Zheng	Lighting the darkness in the sea: A deep learning model for underwater image enhancement.	2022
11	Zheng Liu, Yaoming Zhuang, Pengrun Jia, Chengdong WuHongli Xu, and Zhanlin Liu	A Novel Underwater Image Enhancement Algorithm and an Improved Underwater Biological Detection Pipeline	2022
12	Xenophon Dimas, Elias Fakiris, Dimitris Christodoulou, Nikos Georgiou, 5 scientists	Marine priority habitat mapping in a Mediterranean conservation area (Gyaros, South Aegean) through multi-platform marine remote sensing techniques	2022

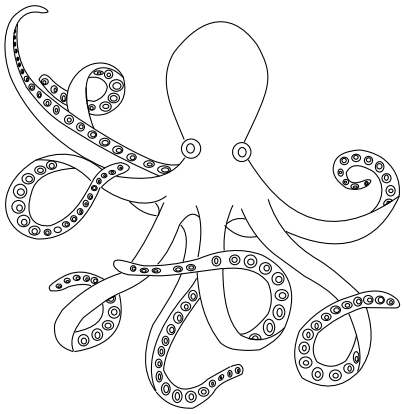
15	Yaofeng Xie, Zhibin Yu, Xiao Yu, & Bing Zheng	Lighting the darkness in the sea: A deep learning model for underwater image enhancement.	2022-08
21	Yian Wang	An Underwater Target Ranging System based on Binocular Vision	2022
23	Yang Yu, & Chenfeng Qin	An End-to-End Underwater-Image-Enhancement Framework Based on Fractional Integral Retinex and Unsupervised Autoencoder.	2023
24	Zefeng Zhao, Zhuang Zhou, Yunting Lai, Tenghui Wang, & 3 scientists	Single underwater image enhancement based on adaptive correction of channel differential and fusion.	2023
25	Shlomi Amitai, Itzik Klein, & Tali Treibitz	Self-Supervised Monocular Depth Underwater	2023
26	Wei Song, Yaling Liu, Dongmei Huang, Bing Zhang + 2 scientists	From shallow sea to deep sea: research progress in underwater image restoration	2022
27	Mochou Yang, Yi Wu, & Guoying Feng	Underwater environment laser ghost imaging based on Walsh speckle patterns	2023
28	Zheyong Li, Jinghua Li, Pei Zhang, Lihui Zheng, & 4 scientists	A Transfer-Based Framework for Underwater Target Detection from Hyperspectral Imagery.	2023
31	Yang Guan, Xiaoyan Liu, Zhibin Yu, Yubo Wang, & 3 scientists	Fast underwater image enhancement based on a generative adversarial framework.	2023
32	Yelena Randall, & Tali Treibitz	FLSea: Underwater Visual-Inertial and Stereo-Vision Forward-Looking Datasets.	2023
33	Yuanheng Li, Shengxiong Yang, Yuehua Gong, Jingya Cao, & 4 scientists	A New Method for Training CycleGAN to Enhance Images of Cold Seeps in the Qiongdongnan Sea	2023
38	Daniel Short, Tingjun Lei, Chaomin Luo, Daniel W. Carruth, & Zhuming	A bio-inspired algorithm in image-based path planning and localization using visual features and maps	2023
39	Leonidas Alagialoglou, Ioannis Manakos, Sofia Papadopoulou, Rizos-Theodoros Chadoulis, & Afroditi Kita	Mapping Underwater Aquatic Vegetation Using Foundation Models With Air- and Space-Borne Images: The Case of Polyphytos Lake	2023-08
41	Ziyang Wang, Liquan Zhao, Tie Zhong, Yanfei Jia, & Ying Cui	Generative adversarial networks with multi-scale and attention mechanisms for underwater image enhancement	2023-10

Positioning & Localization



Nb	*Authors*	*Title*	*Year publication*
1989 - 2021			
6	B. Douillard, N. Nourani-Vatani, M. Johnson-Roberson, S. Williams, & 4 other scientists	FFT-based Terrain Segmentation for Underwater Mapping	2012
7	Gerd Niedzwiedz, & Dirk Schories	New advances in diver-towed underwater GPS receivers	2013
19	Bashar Elnashef, & Sagi Filin	Direct estimation of the relative orientation in underwater environment	2020
39	Xiyun Ge, Hongkun Zhou, Junbo Zhao, Xiaowei Li, & 3 scientists	Robust Positioning Estimation for Underwater Acoustics Targets with Use of Multi-Particle Swarm Optimization	2021-10
2022 - Now			
3	Chensheng Cheng, Can Wang, Dianyu Yang, Weidong Liu, & Feihu Zhang	Underwater Localization and Mapping Based on Multi-Beam Forward Looking Sonar	2022
30	Tuochao Chen, Justin Chan, & Shyamnath Gollakota	Underwater 3D positioning on smart devices	2022

Autonomous systems



Nb	Authors	Title	Year publication
1989 - 2021			
9	A. Ch. Kapoutsis, G. Salavasidis, S. A. Chatzichristofis, J. Braga, & 3 other scientists	The NOPTILUS project overview: A fully-autonomous navigation system of teams of AUVs for static/dynamic underwater map construction	2015
12	Athanasios Ch. Kapoutsis, Savvas A. Chatzichristofis, Lefteris Doitsidis, João Borges de Sousa, & 3 other scientists	Real-time adaptive multi-robot exploration with application to underwater map construction	2016
13	Mingxi Zhou	Underwater Iceberg Profiling and Motion Estimation using Autonomous Underwater Vehicles	2017
15	Tomasz Łuczy´nski, Tobias Fromm, Shashank Govindaraj, Christian A. Mueller, & Andreas Birk	3D Grid Map Transmission for Underwater Mapping and Visualization under Bandwidth Constraints	2017
27	Tom W. Bell, Nick J. Nidzieko, David A. Siegel, Robert J. Miller, & 9 scientists	The Utility of Satellites and Autonomous Remote Sensing Platforms for Monitoring Offshore Aquaculture Farms: A Case Study for Canopy Forming Kelps	2020
34	S. Raghuram, & Sai Anoop Sadineni	Shallow Depth SIFT Based Approach for Mapping underwater surfaces using AUV's	2021
36	Giacomo Montereale Gavazzi, Danae Athena Kapasakali, Francis Kerchof Samuel Deleu, & 2 other scientists	Subtidal Natural Hard Substrate Quantitative Habitat Mapping: Interlinking Underwater Acoustics and Optical Imagery with Machine Learning	2021
38	Gideon Billings, Richard Camilli, & Matthew Johnson-Roberson	Hybrid Visual SLAM for Underwater Vehicle Manipulator Systems	2021
2022 - Now			
4	Emir Cem Gezer, Lin Zhao, Jordan Beason, & Mingxi Zhou	Towards seafloor mapping using an affordable micro-UUV	2022
6	Jinkun Wang, Fanfei Chen, Yewei Huang, John McConnell, & 2 other scientists	Virtual maps for autonomous exploration of cluttered underwater environments	2022
7	Balint Z. Teglasy, Emil Wengle, John R. Potter, & Sokratis Katsikas	Authentication of Underwater Assets	2022
8	Zhimin Li, Zibin Lin, Longsheng Zeng, Hao Wu, and Xue-Feng Zhu	Underwater Transmitted Wavefront Manipulation Based on Bubble-Arrayed Acoustic Metasurfaces	2022
10	Yaofeng Xie, Zhibin Yu, Xiao Yu, & Bing Zheng	Lighting the darkness in the sea: A deep learning model for underwater image enhancement.	2022
12	Xenophon Dimas, Elias Fakiris, Dimitris Christodoulou, Nikos Georgiou, 5 scientists	Marine priority habitat mapping in a Mediterranean conservation area (Gyaros, South Aegean) through multi-platform marine remote sensing techniques	2022
15	Yaofeng Xie, Zhibin Yu, Xiao Yu, & Bing Zheng	Lighting the darkness in the sea: A deep learning model for underwater image enhancement.	2022-08
29	Xiaoyang Bai, Zuodong Liang, Zhongmin Zhu, Alexander Schwing & 2 scientists	Polarization-based underwater geolocalization with deep learning	2022
35	Marios Xanthidis, Bharat Joshi, Monika Roznere, Weihan Wang, &5 Scientists	Towards Mapping of Underwater Structures by a Team of Autonomous Underwater Vehicles	2023
36	Shiying Feng, Xiaofeng Li, Lu Ren, & Shuiqing Xu	Reinforcement learning with parameterized action space and sparse reward for UAV navigation	2023
42	Shuo Pang, Ye Li, Liang Xiao, Francisco Rego, & Teng Ma	Editorial: Unmanned marine vehicles for ocean observation	2024-05
43	Danielle F. Morey, Randall S. Plate, Cherry Y. Wakayama, & Zelda B. Zabinsky	Multifidelity topology design of a maritime survey operation with UUVs	2024-05

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