Journal of
Marine Science and Engineering

MDPI

Editorial

Advanced Techniques for Design and Manufacturing in Marine Engineering

Antonio Mancuso [1,*] and Davide Tumino [2,*]

[1] Dipartimento di Ingegneria, Università degli Studi di Palermo, 90128 Palermo, Italy
[2] Facoltà di Ingegneria e Architettura, Università degli Studi di Enna Kore, 94100 Enna, Italy
* Correspondence: antonio.mancuso@unipa.it (A.M.); davide.tumino@unikore.it (D.T.);
Tel.: +39-91-23897269 (A.M.); +39-935-536491 (D.T.)

Modern engineering design processes are driven by the extensive use of numerical simulations, and naval architecture as well as ocean engineering are no exception. Structural design or fluid dynamic performance evaluation can only be carried out by means of several dedicated pieces of software. Classical naval design methodology can take advantage of the integration of these pieces of software, giving rise to more robust design in terms of shape, structural and hydrodynamic performances, and manufacturing processes.

This Special Issue (SI) on "Advanced Techniques for Design and Manufacturing in Marine Engineering", published in the *Journal of Marine Science and Engineering*, aimed to invite researchers and engineers from both academia and industry to publish the latest progress in design and manufacturing techniques in marine engineering as well as to debate current issues and future perspectives in this research area.

After a rigorous peer review process we accepted 11 papers [1–11], covering a wide range of topics related to the themes proposed in the Special Issue. In [1], machine-learning-based algorithms are developed in order to enhance the real-time decision process of an AUV sailing yacht. In [2], topology optimization techniques and laser powder bed fusion manufacturing have been synergically adopted to redesign the bulb of sailing yachts, leading to drag reduction and improving overall boat performance. In [3], the topic of sail design is discussed by means of numerical fluid structure interaction methods and a practical tool is proposed to support the analyst during the design process of a yacht sail plan. The sail design process is also investigated in [4] but using different tools, such as combining a velocity prediction program, RANS computations, and analytical approaches. The problem of grid generation in a CFD model has been studied in [5], where the authors propose, for the particular shape of a submarine, an automated procedure based on Cartesian adaptive grids. The applicability of a CFD numerical technique to a complex biphase fluid medium is the key point of [6], where the robustness of the method is tested to simulate the ventilation phenomenon occurring in stepped hull planing motor yachts. In [7], an analytical tool incorporating the main dimensional naval coefficients of a sailing boat is adopted during the early design stage, with the additional aim of quickly predicting the overall resistance of the hull. In [8], different pieces of sensor information have been used by the authors to train an algorithm able to control water sample collection in deep water. Computational methods have been used in [9] to determine the resistance of ship fuel tanks when subjected to an increased internal pressure. In [10], a simulation model has been used to design a platform able to compensate for the wave action on a vessel, with particular attention to the shape optimization of the structure in order to reduce the total weight. Finally, in [11], CFD tools using moving meshes have been adopted to simulate turbulent flows that originate in an oscillating water column device and move a Savonius turbine.

Citation: Mancuso, A.; Tumino, D. Advanced Techniques for Design and Manufacturing in Marine Engineering. *J. Mar. Sci. Eng.* **2022**, *10*, 122. https://doi.org/10.3390/jmse10020122

Received: 11 January 2022
Accepted: 13 January 2022
Published: 18 January 2022

Author Contributions: A.M. and D.T. contributed equally to this work. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Acknowledgments: We want to express our sincere thanks to all the authors and the reviewers. A particular thank also goes to Zara Liu, from the Editorial Office of *JMSE*, who has supported us during the whole editing process of the Special Issue.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Yuan, J.; Wang, H.; Zhang, H.; Lin, C.; Yu, D.; Li, C. AUV Obstacle Avoidance Planning Based on Deep Reinforcement Learning. *J. Mar. Sci. Eng.* **2021**, *9*, 1166. [CrossRef]
2. Scarpellini, A.; Finazzi, V.; Schito, P.; Bionda, A.; Ratti, A.; Demir, A.G. Laser Powder Bed Fusion of a Topology Optimized and Surface Textured Rudder Bulb with Lightweight and Drag-Reducing Design. *J. Mar. Sci. Eng.* **2021**, *9*, 1032. [CrossRef]
3. Cirello, A.; Ingrassia, T.; Mancuso, A.; Nigrelli, V.; Tumino, D. Improving the Downwind Sail Design Process by Means of a Novel FSI Approach. *J. Mar. Sci. Eng.* **2021**, *9*, 624. [CrossRef]
4. Cella, U.; Salvadore, F.; Ponzini, R.; Biancolini, M.E. VPP Coupling High-Fidelity Analyses and Analytical Formulations for Multihulls Sails and Appendages Optimization. *J. Mar. Sci. Eng.* **2021**, *9*, 607. [CrossRef]
5. Di Angelo, L.; Duronio, F.; De Vita, A.; Di Mascio, A. Cartesian Mesh Generation with Local Refinement for Immersed Boundary Approaches. *J. Mar. Sci. Eng.* **2021**, *9*, 572. [CrossRef]
6. Cucinotta, F.; Mancini, D.; Sfravara, F.; Tamburrino, F. The Effect of Longitudinal Rails on an Air Cavity Stepped Planing Hull. *J. Mar. Sci. Eng.* **2021**, *9*, 470. [CrossRef]
7. Ingrassia, T.; Mancuso, A.; Nigrelli, V.; Saporito, A.; Tumino, D. Parametric Hull Design with Rational Bézier Curves and Estimation of Performances. *J. Mar. Sci. Eng.* **2021**, *9*, 360. [CrossRef]
8. Xiao, J.; Chen, J.; Tian, Z.; Zhu, H.; Wang, C.; Yang, J.; Sheng, Q.; Zhang, D.; Fang, J. Visible Fidelity Collector of a Zooplankton Sample from the Near-Bottom of the Deep Sea. *J. Mar. Sci. Eng.* **2021**, *9*, 332. [CrossRef]
9. Lee, D.-H.; Cha, S.-J.; Kim, J.-D.; Kim, J.-H.; Kim, S.-K.; Lee, J.-M. Practical Prediction of the Boil-Off Rate of Independent-Type Storage Tanks. *J. Mar. Sci. Eng.* **2021**, *9*, 36. [CrossRef]
10. Zhan, Y.; Tian, H.; Xu, J.; Wu, S.; Fu, J. A Novel Three-SPR Parallel Platform for Vessel Wave Compensation. *J. Mar. Sci. Eng.* **2020**, *8*, 1013. [CrossRef]
11. Dos Santos, L.A.; Fragassa, C.; Santos, A.L.G.; Vieira, R.S.; Rocha, L.A.O.; Conde, J.M.P.; Isoldi, L.A.; Dos Santos, E.D. Development of a Computational Model for Investigation of Oscillating Water Column Device with Savonius Turbine. *J. Mar. Sci. Eng.* **2022**, *10*, 79. [CrossRef]