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Journal of Offshore Mechanics and Arctic Engineering

Editorial

Profiles of Two *JOMAE* Associate Editors (The Sixth in a Continuing Series)

Associate Editors of the Journal of Offshore Mechanics and Arctic Engineering

Now in its 37th year, the ASME *Journal of Offshore Mechanics and Arctic Engineering* remains a trusted and credible source for the dissemination of the published works of researchers, practitioners, and interested parties working in the ocean, offshore, arctic, and related fields. The journal features peer-reviewed research on all aspects of analysis, design, and technology development in these fields. Its primary goal remains one of the showcasing fundamental research and development studies; it has often also featured review articles and perspectives on well-established as well as emerging topics.

As I did in a recent editorial that appeared in the April 2023 issue of this journal [1] (and also in four similar editorials that appeared in June 2019, August 2020, October 2021, and April 2022), I am seeking to once again highlight the efforts, accomplishments, and dedication of an international team of Associate Editors of this journal, focusing on the profiles of two of them at a time. It is this team that helps to maintain the journal's vibrancy, relevance, and timeliness in promoting the exchange of theoretical and practical developments in the ocean, offshore, and arctic engineering arena.

The journal's 38 Associate Editors are experts in specialty areas that include offshore technology; structures, safety, and reliability; materials technology; ocean engineering; ocean renewable energy; pipelines, risers, and subsea systems; computational fluid dynamics and vortex-induced vibration; offshore geotechnics; arctic engineering; and ocean space utilization. They come from 14 countries, including Australia, Canada, China, Denmark, Finland, Germany, India, Italy, Japan, Mexico, Norway, Singapore, the United Kingdom, and the United States. With the help of dedicated reviewers, these Associate Editors help this journal offer six issues each year.

It is a pleasure to continue this series of editorials profiling, each time, two Associate Editors highlighting their expertise areas and accomplishments. I encourage you to read the profiles of previously featured Associate Editors [1]. In this issue, I am pleased to present to you two Associate Editors—Dr. Masoud Hayatdavoodi, Associate Professor in Marine Hydrodynamics and Ocean Engineering at the University of Dundee, United Kingdom, and Dr. Jun Zang, Chair Professor of Coastal and Ocean Engineering, and Deputy Head of the Department of Architecture and Civil Engineering at the University of Bath, United Kingdom.

Associate Editor, Dr. Masoud Hayatdavoodi

Dr. Masoud Hayatdavoodi (Fig. 1) is an Associate Professor in Marine Hydrodynamics and Ocean Engineering at the University of Dundee, United Kingdom. Prior to joining the University of Dundee, he held an Assistant Professors position in Ocean Engineering at Texas A&M University (TAMU), United States.

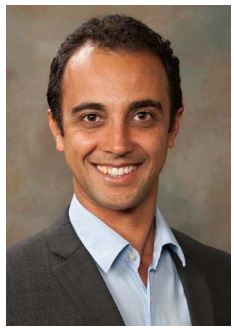

Fig. 1 Dr. Masoud Hayatdavoodi

Dr. Hayatdavoodi obtained his B.Sc. degree in Mechanical Engineering from the Sharif University of Technology, Tehran, Iran, in 2004. He then moved to the Chalmers University of Technology in Gothenburg, Sweden, and completed his M.Sc. degree in Ocean Engineering and Naval Architecture. He later joined the Ocean and Resources Engineering Department of the University of Hawaii (UH), Hawaii, United States, as a Visiting Scholar to complete his M.Sc. thesis in 2007 on fluid–structure interaction. At UH, he then began work on his Ph.D. in Ocean Engineering on the project entitled "Nonlinear Waves Loads on Coastal Structures," under the supervision of Professor R. Cengiz Ertekin. He received his doctoral degree in 2013 and remained at UH, working as a Postdoctoral Researcher for about a year, before starting his academic career at TAMU.

Dr. Hayatdavoodi's research interest is in nonlinear wave mechanics, wave–structure interaction, and linear and nonlinear hydroelasticity, using a combination of experimental, computational, and analytical approaches, with applications to coastal protection and marine renewable energy. Dr. Hayatdavoodi has developed several computationally efficient models for nonlinear fluid flow interaction with rigid and deformable structures involving the use of the Navier–Stokes, Euler's, Lattice–Boltzmann, Green–Naghdi, Boussinesq, and Laplace's equations. The models and formulas developed by Dr. Hayatdavoodi are used by many researchers and practitioners around the world, including for the vulnerability assessment of coastal bridges by the Hawaii Department of Transportation. Figure 2, for example, shows snapshots of the surface elevation of deformation of cnoidal waves, obtained by a model based on the Green–Naghdi wave theory, as they propagate over a submerged three-dimensional ramp.

Dr. Hayatdavoodi notes that "Climate change and its impacts will shape our industrial, economic, and social development in the next decades. Oceans play a key role in both the mitigation and the progression of climate change. New technologies and approaches capable of understanding reliably and efficiently the ocean dynamics and interaction with structures in a changing environment are

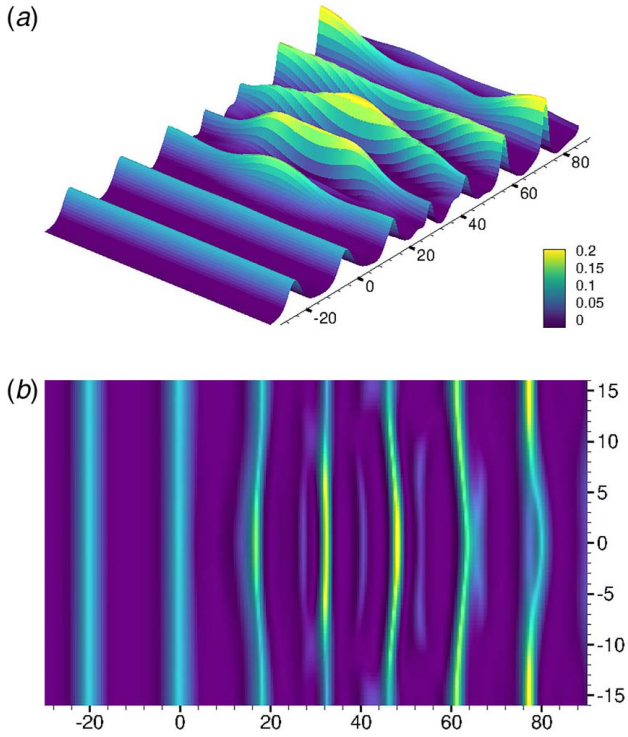

Fig. 2 (*a*) Snapshots of the surface elevation and (*b*) top contour view of cnoidal waves, obtained by the Green–Naghdi equations, propagating over a submerged three-dimensional ramp

essential to the sustainable development of renewable energy and coastal defense."

Recently, the research themes of Dr. Hayatdavoodi have expanded to the application of fluid mechanics to the fields of medicine and forensic sciences—e.g., in the study on the motion of human bodies in waterways to assist police forces in locating missing bodies; in the study on airflow in the elastic and complex geometry of human larynx; and in studies on blood flow in deformable arteries.

Dr. Hayatdavoodi currently supervises three postdoctoral researchers and seven Ph.D. students on a range of subjects from hydrodynamics to medical applications; he also co-supervises students in fluid mechanics and geotechnical engineering. His former postdoctoral researchers and Ph.D. students are now active at academic institutes (such as Harbin Engineering University) or with the industry/government work. Dr. Hayatdavoodi has close collaborations with researchers at the University of Hawaii, United States, and at Harbin Engineering University, China.

Dr. Hayatdavoodi has made remarkable contributions toward the development of various educational and scholarly activities. He proposed and led the development of a new M.Sc. program in Marine Hydrodynamics and Ocean Engineering at the University of Dundee. He has also designed and developed an International PhD Summer School in Ocean Engineering, whose aims are to establish a world-class annual educational event and prepare future ocean engineering leaders. Three categories of topics are covered in the Summer School, including (i) important scientific/technical subjects not typically discussed in Ocean Engineering programs; (ii) industry-focused subjects; and (iii) topics on general skills (including stress management, negotiation, and ethics). The first offering of the PhD Summer School was in 2019, and the second took place in August 2023. Dr. Hayatdavoodi is the organizer of the 39th International Workshop on Water Waves and Floating Bodies, to be held in April 2024 in Scotland, and is a co-founder and an organizer of the annual International Workshop on Marine Hydrodynamics Modelling. In addition to *JOMAE*, he serves on the editorial board of other journals, including the *Journal of Ocean Engineering and Marine Energy*, Springer; and the *Journal of Waterway, Ports, Coastal and Ocean Engineering*, ASCE.

Associate Editor, Dr. Jun Zang

Fig. 3 Dr. Jun Zang

Dr. Jun Zang (Fig. 3) is a Chair Professor of Coastal and Ocean Engineering, and the Deputy Head of the Department of Architecture and Civil Engineering at the University of Bath, United Kingdom, where she has worked since January 2007. Prior to that, she was a Departmental Lecturer at the University of Oxford, where she was involved in the further development of a second-order potential flow solver, DIFFRACT, working with Prof. Rodney Eatock Taylor and Prof. Paul Taylor. There, she also led a team that successfully developed the Boussinesq cut-cell method for shallow-flow simulations, with the support of Prof. Alistair Borthwick and Prof. Paul Taylor. Before she moved to Oxford, she had worked as a Research Fellow in Manchester, as a Civil Engineering Consultant in Singapore, and as a Lecturer at Dalian University of Technology (DUT), China. She earned her Ph.D. at DUT under the supervision of Prof. Dahong Qiu.

Dr. Zang's research is focused on investigating the impact of extreme waves on marine renewable energy systems and coastal structures. New insights from her investigations have informed the development of a range of fast, high-fidelity methods and models, ranging from a particle-based particle-in-cell (PIC) numerical method to physics-informed methods for evaluating higher-order nonlinear wave loading on monopiles.

To date, Dr. Zang and her team have made significant contributions to the development and applications of advanced numerical methods to assess the wave impact on coastal and offshore structures. These include (1) the development of an advanced hybrid Eulerian and Lagrangian PIC method for simulating complex breaking waves and their impact on coastal and offshore structures accurately and efficiently; (2) a pioneering application of the open-source computational fluid dynamics tool, OpenFOAM, to address a wide range of challenging problems where strong nonlinearity and viscosity must be taken into account; (3) the development of a second-order potential flow solver, DIFFRACT, for the modeling of both nonlinear free surface runup and nonlinear wave loading on offshore structures; and (4) the development of the Boussinesq cut-cell method for simulating wave interaction with coastal structures in shallow water.

Dr. Zang has led or participated in several large national and international research projects that underpin the development of open-source engineering tools and open-source numerical models to help accelerate the development of marine renewable energy and improve the resilience and adaptation of coastal areas under extreme wave conditions. As a project leader on an European Union-funded study investigating nonlinear waves and the impact of extreme waves on offshore wind turbine foundations, she led an effort seeking to assess the importance of higher-order nonlinear wave loading (see Fig. 4) and the development of a novel fast method for predicting these highly important higher-order nonlinear wave loads. Such predictions could not be readily calculated before. This research was reported in the *Journal of Fluid Mechanics*, a leading journal in the field. She is currently leading a consortium, including the Universities of Bath, Oxford, and Strathclyde, to further develop this method into a new open-source engineering tool as part of an Engineering and Physical Sciences Research Council (EPSRC) funded project (SEA-SWALLOWS, 2021-2024).

Apart from her other roles, Dr. Zang is currently the Chair of the Partnership for Research in Marine Renewable Energy (PRIMaRE), a partnership of world-class research institutions based in the

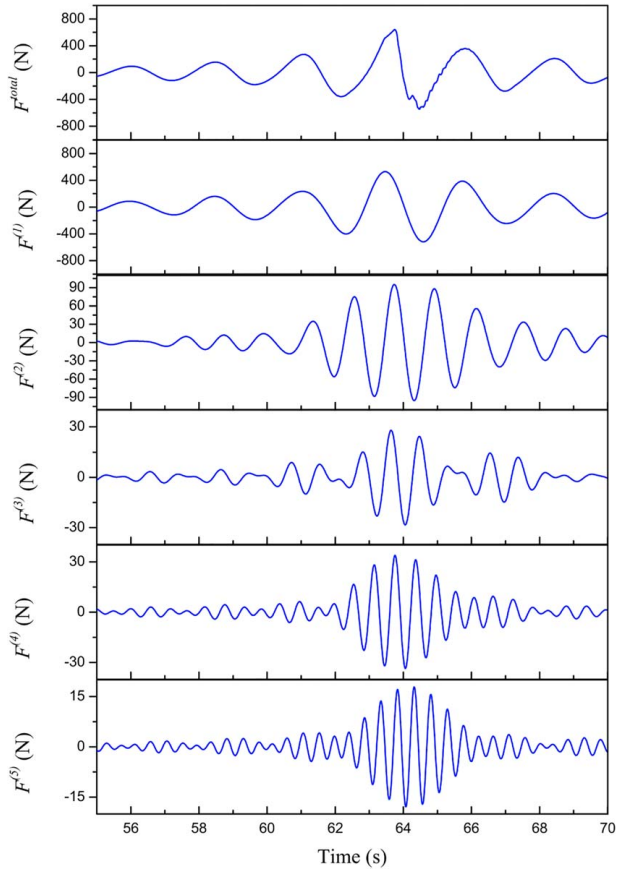

Fig. 4 Studies on the importance of high-order nonlinear wave loading on a monopile, a typical offshore wind turbine foundation, under extreme waves

United Kingdom engaged in research on marine renewable energy. She is a Steering Committee Member of the Collaborative Computational Project in Wave-Structure Interaction (CCP-WSI), which brings together two distinct computational communities: fluid dynamics and structural mechanics. Dr. Zang sits on the Environmental Forces Committee of the Society for Underwater Technology, United Kingdom. She is an Associate Editor of the ASME *Journal on Offshore Mechanics and Arctic Engineering* and of the *Frontiers in Marine Science*. She is also an editorial board member for several other journals. She regularly reviews research proposals for the United Kingdom, Norway, German, Spanish, and Dutch research councils, and has been an external examiner for over 20 Ph.D. theses in the United Kingdom and at universities in several countries. Dr. Zang co-chaired the 30th International Workshop on Water Waves and Floating Bodies (IWWWFB) in 2015 as well as other international conferences in recent years, including the 10th PRIMaRE Conference held in June 2023 in Bath. Dr. Zang strongly believes that strong collaborations are essential if we are to tackle the grand challenges we face in a changing climate.

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Reference

[1] Manuel, L., 2023, "Profiles of Two JOMAE Associate Editors (The Fifth in a Continuing Series)," ASME J. Offshore Mech. Arct. Eng., **145**(2), p. 020201.