

PERSONAL INFORMATION

Name: Abbas Khayer
Date of Birth: June, 1979
Current Position: Associate Professor (Tenured)
Laboratory of Applied Mechanics,
Department of Civil & Earth Resources Engineering
Kyoto University, Kyoto, Nishikyo-ku 615-8540, Japan
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**EDUCATION BACKGROUND**

Sep. 1997 – Sep. 2002: *Bachelor Course Student*, Department of Civil Engineering, Shiraz, Iran
Oct. 2002 – Mar. 2005: *Master Course Student*, College of Civil Engineering, Iran University of Science and Technology, Iran
Oct. 2005 – Sep. 2008: *Doctoral Course Student*, Department of Urban & Environmental Engineering, Kyoto University, Japan

EMPLOYMENT

Oct. 2008 – Oct. 2009: *Postdoctoral Research Associate*, Department of Urban & Environmental Engineering, Kyoto University, Japan
Nov. 2009 – March 2013: *Lecturer*, Department of Civil and Earth Resources Engineering, Kyoto University, Japan
April 2013 – present: *Associate Professor (Tenured)*, Department of Civil and Earth Resources Engineering, Kyoto University, Japan

PROFESSIONAL ASSOCIATIONS

Steering Committee member of SPHERIC (SPH rEsearch and engineeRing International Community: the largest international community for SPH development and applications) [[Link](#)]
Member of Solids & Structures Interest Group (SSIG) of SPHERIC
Member of International Society of Offshore and Polar Engineering (ISOPE) [[Link](#)]
Member of International Association of Hydraulic Engineering and Research (IAHR)
Member of Japan Society of Civil Engineers (JSCE)
Member of Japan Society of Computational Engineering and Science (JSCES)
Member of Research Committee of JSCE Computational Wave Flume

INTERNATIONAL SCIENTIFIC ACTIVITIES

Associate Editor: Applied Ocean Research [[Link](#)]
Editor: Coastal Engineering Journal [[Link](#)]
Editorial Board: Ocean Engineering [[Link](#)]
Associate Editor: International Journal of Offshore and Polar Engineering [[Link](#)]
Editorial Board: European Journal of Mechanics B/Fluids [[Link](#)]
Editorial Panel: Proceedings of the Institution of Civil Engineers, UK - Maritime Engineering [[Link](#)]

Technical Program Committee: ISOPE International Conferences [[Link](#)]

Editorial Board: Journal of Marine Science and Application [[Link](#)]

Associate Editor: Ocean Systems Engineering [[Link](#)]

Scientific Committee of SPHERIC (SPH rEsearch and engineRing International Community) [[Link](#)]

Review Committee Candidate: Japan Society for the Promotion of Science (JSPS)

Reviewer: for more than 60 SCI Journals [[Link](#)]

AWARDS & ACHIEVEMENTS

Listed as one of the World's Top 2% Scientists of 2020 [[Link](#)] & 2021 [[Link](#)] by Stanford University

Coastal Engineering Journal (CEJ) Citation Award in 2019 & 2020 [[Link](#)]

C H Kim Award by the International Society of Offshore and Polar Engineers (ISOPE) in recognition of outstanding technical achievements in and exceptional contribution to computational fluid mechanics in ocean engineering (June 13, 2018) [[Link](#)] – This award was founded in 2006 to commemorate Prof. Cheung Hun Kim (Texas A & M University), a founding member of ISOPE, and Abbas Khayyer has been the Youngest among all awardees since then [[Link](#)]

Top 1% Reviewer in Cross-Field and Engineering by Publons – September 2019 [[Link](#)]

Best Paper Award of international sessions, 52nd Annual Meeting of Hydraulic Engineering, Japan Society of Civil Engineers (JSCE), March 2008, Hiroshima, Japan [[Link](#)]

Scholarship of the Japanese Government, Ministry of Education, Culture, Sports, Science and Technology for the Doctoral Course (Oct. 2005 – Sep. 2008)

PATENT

Gotoh, H. and **Khayyer, A.**: Method and device for determining interface particle used in particle method, and program for determining interface particle, WO/2010/032656, March 2010. [[Link](#)]

RESEARCH DIRECTIONS/ACHIEVEMENTS

Research directions/achievements correspond to both *theoretical scientific* and *practical engineering* research that can be concisely categorised as:

1. ***Theoretical/mathematical studies*** on enhancement of accuracy, stability, conservation and convergence of Lagrangian meshfree or particle methods as robust new generation computational methods with a wide range of potential reliable applicability in engineering and science. In this regard, several novel schemes have been developed that have been highly cited and widely applied by international researchers. Developments mainly correspond to ***fluid*** and ***solid mechanics*** in the framework of ***Newtonian*** and ***Hamiltonian mechanics*** within the context of several particle methods including Smoothed Particle Hydrodynamics (SPH) and Moving Particle Semi-implicit (MPS) methods. Examples of developed schemes include: [CISPH](#), [CMPS](#), [HS](#), [HL](#), [ECS](#), [GC](#), [FDS](#), [CIECS](#), [OPS](#), [HSPH](#) (for both homogeneous and ***composite structures***) and [BM](#).
2. ***Practical engineering applications*** of developed/refined particle methods for a wide range of engineering applications including coastal/ocean/structural engineering corresponding to wave breaking, sloshing, wave-structure interactions, wave-porous media interactions, structural dynamics, resilient structure design, slamming and sediment transport.
3. ***Development of entirely Lagrangian meshfree coupled fluid-structure interaction computational solvers*** for ***hydroelastic fluid-structure interactions*** with novel numerical schemes/algorithms including consistent coupling schemes. Examples of developed computational solvers include: [ISPH-SPH](#), [MPS-MPS](#) and [ISPH-HSPH](#).

SCIENTOMETRIC DATA

Scopus	Number of documents: 70	Citations: 3362	<i>h</i> -index: 28	[Link]
Web of Science	Number of documents: 55	Citations: 2773	<i>h</i> -index: 26	[Link]
Google Scholar	Number of documents: 157	Citations: 4596	<i>h</i> -index: 30	[Link]
ResearchGate	Number of documents: 100	Citations: 3428	RG Score: 30.80	[Link]
Publons	Number of documents: 75	Reviews: 447	Editor Records: 336	[Link]

SELECTED RECENT PUBLICATIONS

Publications: 84 journal articles and **54** International Conference papers and Proceedings. *Selected Recent Publications* Include:

1. **Khayyer, A.**, Gotoh, H., Shimizu, Y., Nishijima, Y.: A 3D Lagrangian meshfree projection-based solver for hydroelastic Fluid–Structure Interactions, *Journal of Fluids and Structures*, 105, 103342, 2021. [\[Link\]](#)
2. Luo, M., **Khayyer, A.**, Lin, P.: Particle methods in ocean and coastal engineering, *Applied Ocean Research*, 114, 102734, 2021. [\[Link\]](#)
3. **Khayyer, A.**, Gotoh, H., Shimizu, Y., Nagashima, K.: A coupled incompressible SPH-Hamiltonian SPH solver for hydroelastic FSI corresponding to composite structures, *Applied Mathematical Modelling*, 94, 242-271, 2021. [\[Link\]](#)
4. **Khayyer, A.**, Gotoh, H., Shimizu, Y., Hattori, S.: Multi-resolution ISPH-SPH for accurate and efficient simulation of hydroelastic fluid-structure interactions in ocean engineering, *Ocean Engineering*, 226, 108652, 2021. [\[Link\]](#)
5. **Khayyer, A.**, Gotoh, H., Shimizu, Y.: A Projection-Based Particle Method with Optimized Particle Shifting for Multiphase Flows with Large Density Ratios and Discontinuous Density Fields, *Computers & Fluids*, 179, 356-371, 2019. [\[Link\]](#)
6. **Khayyer, A.**, Tsuruta, N., Shimizu, Y., Gotoh, H.: Multi-resolution MPS for incompressible fluid-elastic structure interactions in ocean engineering, *Applied Ocean Research*, 82, 397-414, 2019. [\[Link\]](#)
7. **Khayyer, A.**, Gotoh, H., Falahaty, H., Shimizu, Y.: An enhanced ISPH-SPH coupled method for simulation of incompressible fluid-elastic structure interactions, *Computer Physics Communications*, 232, 139-164, 2018. [\[Link\]](#)
8. **Khayyer, A.**, Gotoh, H., Shimizu, Y., Gotoh, K., Falahaty, H., Shao, S.: Development of a projection-based SPH method for numerical wave flume with porous media of variable porosity, *Coastal Engineering*, 140, 1-22, 2018. [\[Link\]](#)
9. **Khayyer, A.**, Gotoh, H. and Shimizu, Y.: Comparative study on accuracy and conservation properties of two particle regularization schemes and proposal of an optimized particle shifting scheme in ISPH context, *Journal of Computational Physics*, 332, 236-256, 2017. [\[Link\]](#)

RESEARCH GRANTS

Grant-in-Aid for Scientific Research (B) by Japan Society for the Promotion of Science, “New development of particle method solid-liquid multiphase flow model by SPS mass transport model”, April 2021 ~ March 2024 (Co-Investigator) [\[Link\]](#)

Grant-in-Aid for Scientific Research (C) by Japan Society for the Promotion of Science, “Development of a reliable and adaptive multi-physics computational method for fluid-structure interactions encountered in ocean/coastal engineering”, April 2018 ~ March 2022 (Principal Investigator) [\[Link\]](#)

Grant-in-Aid for Scientific Research (A) by Japan Society for the Promotion of Science, “Innovative design of breakwaters as a strategy for resilient coastal city against storm surges during typhoons”, April 2018 ~ March 2021 (Co-Investigator) [\[Link\]](#)

Grant-in-Aid for Young Scientists by Japan Society for the Promotion of Science, “Development of a computational method for hydroelastic multiphase water slamming problems”, April 1, 2016 ~ March 31, 2018 (Principal Investigator) [\[Link\]](#)

Grant-in-Aid for Scientific Research (B) by Japan Society for the Promotion of Science, “Development of numerical wave flume for a resilient design of coastal structures against violent waves”, April 2009 ~ March 2011 (Co-Investigator) [[Link](#)]

Grant-in-Aid for Young Scientists by Japan Society for the Promotion of Science, “Development of an accurate and efficient particle method for practical simulations of multiphase fluid flows”, April 1, 2013 ~ March 31, 2015 (Principal Investigator) [[Link](#)]

SELECTED INVITED TALKS

1. Invited talk at Second International Workshop of Numerical Modelling of Wave-Structure Interaction (organised by IIT Madras, UCL and City, University of London) [[Link](#)]
2. Keynote presentation at 8th International Conference on the Application of Physical Modelling in Coastal and Port Engineering and Science (Coastlab2020), Zhoushan, China December 10th, 2020 [[Link](#)]
3. Keynote presentation at SPHERIC International Conference at Harbin, China, January 15th, 2020 [[Link](#)]
4. Invited talk at the 72nd Annual Meeting of the APS (American Physical Society) Division of Fluid Dynamics, November 25th, 2019 [[Link](#)]
5. Invited talk at the University of Manchester, Manchester, U.K., September 25th, 2017. Title: Particle Methods for Fluid-Structure Interactions, Recent Advancements and Future Perspectives [[Link](#)]
6. Invited talk at the University of Sheffield, Sheffield, U.K., September 27th, 2017. Title: Lagrangian Particle Methods: Latest Achievements and Future Perspectives [[Link](#)]
7. Invited talk at Osaka University, Osaka, Japan, May 15th, 2017. Title: Lagrangian Particle Methods for Ocean Engineering - Current Achievements and Future Perspectives [[Link](#)]
8. Keynote presentation, 7th International Conference on Computational Methods (ICCM2016), University of California at Berkeley, CA, USA, August 3rd, 2016 [[Link](#)]
9. Invited speaker and a session organizer of the JSCES IWACOM workshop, Tokyo, Japan, October 2015 [[Link](#)]

LEADERSHIP & MANAGEMENT

Co-Chair of Third International Online Workshop on SPH (SPH Online III), September 6th, 2021 [[Link1](#)] [[Link2](#)]

Chair of Second International Online Workshop on SPH (SPH Online II), March 29th, 2021 [[Link](#)] [[Part I](#)] [[Part II](#)]

Chair of Extracurricular International Online Workshop – International Course Program (EIOW-ICP), Kyoto University, March 2nd-8th, 2021 [[Link](#)]

Chair of First International Online Workshop on SPH (SPH Online I), August 17th, 2020 [[Link](#)] [[Part I](#)] [[Part II](#)]

Leading Guest Editor for 2 Special Issues for Elsevier Journals, Applied Ocean Research [[Link](#)] and European Journal of Mechanics B/Fluids [[Link](#)]

Member of Solids & Structures Interest Group (SSIG) of SPHERIC, leading activities of the SPH community in this field

Leading/Managing activities of SPHERIC community as a Steering Committee member [[Link](#)]

Organising member of Hydrodynamics sessions of ISOPE annual international conference since 2015 [[Link](#)]

Committee member for question review of entrance exam of graduate school of engineering (2015, 2017, 2020)

Committee member for execution of entrance exam of graduate school of engineering (2014, 2016, 2018, 2021)

Manager of International Course Program of Civil Engineering of Kyoto University, August 2013-March 2015

Co-Chair of Applied Mechanics Laboratory, Kyoto University (since April 2013) [[Link](#)]