SHENGZHE (JACKSON) WANG, Ph.D.

Assistant Professor
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EDUCATION

May 2022 **Ph.D. in Civil & Environmental Engineering**
Princeton University | Princeton, NJ, United States
- Dissertation Advisors: Profs. Maria Garlock & Branko Glisic
- Dissertation Title: Deployable Hyperbolic Paraboloidal Umbrellas as Adaptable Aquatecture for Coastal Defense Applications

Jun 2017 **MPhil in Civil Engineering**
University of Sydney | Sydney, NSW, Australia
- Thesis Advisor: Prof. Luming Shen
- Thesis Title: On the High Strain Rate Response of Partially Saturated Porous Media

May 2013 **BEng (1st Class Honors) in Civil & Environmental Engineering**
University of Auckland | Auckland, New Zealand
- Thesis Advisor: Dr. Piotr Omenzetter
- Thesis Title: Forced Vibration Testing of Full-scale Bridges

RESEARCH INTERESTS

Climate resilience & adaptation
Thin-shell & heritage structures
Coastal & floating structures
Fluid-structure interaction & CFD
Kinetic & deployable structures
Soil dynamics & impact engineering

PROFESSIONAL APPOINTMENTS

2022 – present **University of Colorado Denver** | Denver, CO, United States
- Assistant Professor of Structural Engineering

2017 – 2022 **Princeton University** | Princeton, NJ, United States
- Wallace Memorial Fellow (2021 – 2022)
- Assistant in Research & Instruction (2018 – 2021)
- Gordon Y.S. Wu Fellow (2017 – 2022)

2017 **Stantec Inc. (formally Wood & Grieve)** | Sydney, NSW, Australia
- Structural Engineer

2015 – 2017 **University of Sydney** | Sydney, NSW, Australia
- A.E. & F.A.Q. Stephens Fellow (2015 – 2017)
- Academic Tutor (2015 – 2016)

2013 – 2015 **Beca Group Ltd.** | Wellington, New Zealand
- Structural Engineer

2012 – 2013 **University of Auckland** | Auckland, New Zealand
- Research Fellow

AWARDS, FELLOWSHIPS, & RECOGNITION

2021 **Moisseiff Award** | American Society of Civil Engineers (ASCE)
2021 **Wallace Memorial Fellowship** | Princeton University
2020 **SEAS Award for Excellence** | Princeton University
2020 **Thornton Tomasetti Student Innovation Fellowship** | Thornton Tomasetti Foundation

2017 **Gordon Y.S. Wu Graduate Fellowship** | Princeton University
2015 **University of Sydney Top-up Scholarship** | University of Sydney
2015 **A.E. & F.A.Q. Stephens Scholarship** | University of Sydney
2012 **Summer Research Scholarship** | University of Auckland
2012 **Dean's List in Engineering** | University of Auckland
2011 **NZ Society of Local Govt. Managers Prize** | University of Auckland
2010 **City of Sails Engineering Scholarship** | University of Auckland

PEER-REVIEWED JOURNAL PUBLICATIONS

1. Maldar, N., Wang, A., **Wang, S.** (under review). Buoying Urban Futures: A Critical Review of Engineered and Vernacular Floating Houses for Sustainable Development and Climate Adaptation. Journal of Building Engineering
2. Thomas, A., ElDarwich, H., **Wang, S.** (under review). Parameterizing the stiffness of tubular hypar umbrellas using genetic programming. Journal of the International Association for Shell and Spatial Structures
3. **Wang, S.** (under review). Derivation of 3D dynamics for rigid floating structures under directional wave excitation. Sustainable Marine Structures
4. **Wang, S.**, Dong, G., Walker, T., Sandford, H. (2025). Mechanical analyses of Félix candela's N-edged hyperbolic paraboloid umbrellas as tubular structures under uniaxial compression. Architecture, Structures and Construction, 5
5. **Wang, S.**, Chang, C.-W. (2025). SPH simulations to investigate the influence of realistic mangroves in reducing breaking wave forces on coastal structures. Ocean Engineering, 316
6. **Wang, S.**, Chuang, W.-L. (2025). Dynamic analysis of breaking wave impact on a floating offshore wind turbine via smoothed particle hydrodynamics. Marine Structures, 100
7. ElDarwich, H., Mansouri, I., Garlock, M., **Wang, S.** (2024). Predicting maximum deflection of N-edged thin-shelled hyperbolic-paraboloid umbrella using machine learning techniques. Thin-Walled Structures, 205
8. Pawitan, K. A., Garlock, M., **Wang, S.** (2024). Multiphase SPH analysis of a breaking wave impact on elevated structures with vertical and inclined walls. Applied Ocean Research, 142
9. **Wang, S.** (2023). Simplified analytical solutions to the yaw dynamics of modular floating structures. Ocean Engineering, 276
10. Hughes, M., Celli, S., Heubner, C., Garlock, M., Ottoni, F., Del Curto, D., **Wang, S.**, Glisic, B. (2023). Nonlinear finite element analysis for structural investigation and preservation of hybrid thin tile-reinforced concrete domes of Cuba's historic school of ballet classrooms. Journal of Performance of Constructed Facilities (ASCE)
11. **Wang, S.** (2022). Analytical solutions for the dynamic analysis of a modular floating structure for urban expansion. Ocean Engineering, 266
12. Wu, G., Garlock, M., **Wang, S.** (2022). A Decoupled SPH-FEM Analysis of Hydrodynamic Wave Pressure on Hyperbolic-Paraboloid Thin-shell Coastal Armor and Corresponding Structural Response. Engineering Structures, 268
13. **Wang, S.**, Contreras-Jimenez, J. A., Jorquera-Lucerga, J. J., Garlock, M. (2022). Structural analysis of Félix Candela's hexagonal hyperbolic paraboloidal umbrellas. Engineering Structures, 266
14. **Wang, S.**, Garlock, M., Deike, L., Glisic, B. (2022). Feasibility of Kinetic Umbrellas as deployable flood barriers during landfalling hurricanes. Journal of Structural Engineering (ASCE), 148 (5)
15. **Wang, S.**, Garlock, M., Glisic, B. (2022). Geometric and area parameterization of N-edged hyperbolic paraboloidal umbrellas. Engineering Structures, 250
16. **Wang, S.**, Garlock, M., Glisic, B. (2021). Kinematics of deployable hyperbolic paraboloid umbrellas. Engineering Structures, 244
17. **Wang, S.**, Notario, V., Garlock, M., Glisic, B. (2021). Parameterization of hydrostatic behavior of deployable hypar umbrellas as flood barriers. Thin-Walled Structures, 163
18. **Wang, S.**, Garlock, M., Glisic, B. (2021). Parametric modeling of depth-limited wave spectra under hurricane conditions with applications to Kinetic Umbrellas against storm surge inundation. Water, 13
19. **Wang, S.**, Levine, A., Garlock, M., Contreras-Jimenez, J. A., Jorquera-Lucerga, J. J. (2020). Structural evaluation of Felix Candela's 8-sided hyperbolic paraboloidal umbrellas. Engineering Structures, 222

20. **Wang, S.**, Garlock, M., Glisic, B. (2020). Hydrostatic response of deployable hyperbolic-paraboloid umbrellas as coastal armor. Journal of Structural Engineering (ASCE), 146 (6)
21. **Wang, S.**, Shen, L., Nguyen, G.D., Maggi, F., El-Zein, A., Zheng, Y. (2019). An empirical approach for the quantification of uniaxial compressive stress-strain of partially saturated granular media under high strain rates. Soil Dynamics and Earthquake Engineering, 120, 245-256
22. **Wang, S.**, Shen, L., Maggi, F., El-Zein, A., Nguyen, G.D., Zheng, Y., Zhang, H., Chen, Z. (2018). Influence of dry density and confinement environment on the high strain rate response of partially saturated sand. International Journal of Impact Engineering, 116, 65-78
23. Fu, K., Wang, H., **Wang, S.**, Chang, L., Shen, L., Ye, L. (2018). Compressive behavior of shear-thickening fluid with concentrated polymers at high strain rates. Materials and Design, 140, 295-306
24. Hanaor, D., Flores-Johnson, E.A., **Wang, S.**, Quach, S., Dela-Torre, K., Gan, Y., Shen, L. (2017). Mechanical properties in crumple-formed paper derived materials subjected to compression. Heliyon, 3 (6)
25. **Wang, S.**, Flores-Johnson, E.A., Shen, L. (2017). A technique for the elimination of stress waves overlapping in the split Hopkinson pressure bar. Experimental Techniques, 41, 345-355
26. **Wang, S.**, Shen, L., Maggi, F., El-Zein, A., Nguyen, G.D. (2017). Uniaxial compressive behavior of partially saturated granular media under high strain rates. International Journal of Impact Engineering, 102, 156-168
27. Flores-Johnson, E.A., **Wang, S.**, Maggi, F., El Zein, A., Gan, Y., Nguyen, G.D., Shen, L. (2016). Discrete element simulation of dynamic behavior of partially saturated sand. International Journal of Mechanics and Materials in Design, 12 (4), 495-507
28. **Wang, S.**, Orense, R.P. (2014). Modelling of raked pile foundations in liquefiable ground. Soil Dynamics and Earthquake Engineering, 64, 11-23

CONFERENCE PROCEEDINGS & PRESENTATIONS

1. Johnson, M., **Wang, S.** (2025). Structural analysis of hypar foundations: revisiting Candela's umbrella with modern FEA. Research & Creative Activities Symposium (RaCAS), University of Colorado Denver, Denver, Colorado
2. **Wang, S.**, Chuang, W.-L. (2025). SPH analysis of extreme wave directionality on the dynamics of floating offshore wind turbines. 19th SPHERIC World Conference, Barcelona, Spain
3. **Wang, S.**, Chang, C.-W. (2025). SPH modeling of breaking wave impact on a seawall in the presence of realistic Rhizophora mangroves. 19th SPHERIC World Conference, Barcelona, Spain
4. **Wang, S.**, Chang, C.-W. (2025). Simulation of breaking wave impact on coastal structures in the presence of realistic Rhizophora mangroves via smoothed particle hydrodynamics. Engineering Mechanics Institute Conference, Anaheim, California
5. **Wang, S.**, Garlock, M., Contreras-Jiménez, J. A., Jorquera-Lucerga, J. J. (2025). Understanding Felix Candela's 8-sided folded hypars. IX ACHE Congress, Granada, Spain
6. **Wang, S.**, Han, B. (2024). Floating cities for climate change adaptation: exploring motion perception thresholds via immersive virtual reality. Proceedings of 38th Conference on Coastal Engineering, Rome, Italy
7. Walker, T., Dong, G., **Wang, S.** (2024). Mechanical Performance of Mirrored Hypar Umbrella Sandwich Cells Through Compression Testing. Proceedings of the IASS Annual Symposium, Zurich, Switzerland
8. Pawitan, K. A., Garlock, M., **Wang, S.** (2024). Effects of wall inclination on elevated structures subject to breaking waves: a multiphase SPH numerical exploration. Engineering Mechanics Institute Conference, Chicago, Illinois
9. Walker, T., **Wang, S.** (2024). Mechanical performance of mirrored hypar umbrella sandwich cells through compression testing. Research & Creative Activities Symposium (RaCAS), University of Colorado Denver, Denver, Colorado
10. Sullivan Stremel, A., **Wang, S.** (2024). Virtual Reality (VR) for Determination of Motion Perception Thresholds in a Floating Environment. Research & Creative Activities Symposium (RaCAS), University of Colorado Denver, Denver, Colorado
11. Walker, T., **Wang, S.** (2023). Geometric mechanics of hypar-derived metamaterials. Research & Creative Activities Symposium (RaCAS), University of Colorado Denver, Denver, Colorado

12. **Wang, S.**, Han, B. (2023). Immersive virtual reality as a communication tool towards the development of floating cities for climate adaptation. At What Point Managed Retreat?: Habitability and Mobility in an Era of Climate Change, Columbia University, New York City, New York
13. **Wang, S.**, Han, B. (2023). Simulating structural motions of floating cities in an immersive virtual reality environment. ASCE International Conference on Computing in Civil Engineering, Oregon State University, Corvallis, Oregon
14. **Wang, S.** (2022). SPH and analytical modeling of an urban floating structure for coastal expansion. Proceedings of 37th Conference on Coastal Engineering, Sydney, Australia
15. **Wang, S.**, Garlock, M., Glisic, B. (2022). "Hydrodynamic modeling of Kinetic Umbrellas during landfalling hurricanes". ASCE Structures Congress, Atlanta, Georgia
16. **Wang, S.**, Garlock, M., Glisic, B. (2021). A mechanism for the deployment of Kinetic Umbrellas for coastal hazard adaptation. Proceedings of the IASS Annual Symposium, Guilford, United Kingdom
17. **Wang, S.**, Notario, V., Garlock, M., Glisic, B. (2021). Structural parameterization of Kinetic Umbrellas under hydrostatic inundation. Proceedings of the IASS Annual Symposium, Guilford, United Kingdom
18. **Wang, S.**, Garlock, M., Glisic, B. (2019). Kinetic Umbrellas for coastal defense applications. Proceedings of the IASS Annual Symposium, Barcelona, Spain
19. **Wang, S.**, Garlock, M., Glisic, B. (2019). Modeling of Kinetic Umbrellas for coastal hazard mitigation. Engineering Mechanics Institute Conference, California Institute of Technology, Pasadena, California
20. **Wang, S.**, Shen, L., Maggi, F., El Zein, A., Nguyen, G. (2016). Dynamic response of partially saturated porous media under impact loading. International Conference on Porous Media, Sydney, NSW, Australia
21. **Wang, S.**, Shen, L., Maggi, F., El-Zein, A. & Nguyen, G.D. (2016). High strain rate behavior of unsaturated sand. 10th International Conference on Structural Integrity and Failure (SIF-2016), University of Adelaide, Adelaide, Australia
22. **Wang, S**., Orense, R.P. (2013). Modelling of pile response in laterally spreading liquefiable ground. Proceedings of the 19th NZGS Geotechnical Symposium, Queenstown, New Zealand

INVITED TALKS

1. **Wang, S.** (2024) "Dynamics of wave impact on coastal structures". Invited Lecture on Structural Dynamics. University of Colorado Boulder, Boulder, Colorado
2. **Wang, S.** (2024) "Exploring motion perception thresholds for floating environments via immersive virtual reality". College of Engineering, Design and Computing Seminar. University of Colorado Denver, Denver, Colorado
3. **Wang, S.** (2024) "Educational Efforts: Structural Engineering and the Ocean Environment". Climate Adaptation Workshop: Structural Design for Coastal Flood Resilience, Princeton University, Princeton, New Jersey
4. **Wang, S.** (2024) "From Adaptable Aquatecture to floating cities: strategies for a climate resilient urban future". CEE Distinguished Seminar Series, Northeastern University, Boston, Massachusetts
5. **Wang, S.** (2023) "From Structural Art to Adaptable Aquatecture for a More Resilient Urban Future". SIR Frontiers Seminar Series, South China University of Technology, China
6. **Wang, S.** (2022) "High strain rate testing of unsaturated porous media". Boase Seminar Series in Geotechnical Engineering and Geomechanics, University of Colorado Boulder, Boulder, Colorado
7. **Wang, S.**, Garlock, M., Glisic, B. (2020) "Adaptable Aquatecture: Smart Kinetic Umbrellas for Coastal Protection". Boston Harbor Now Climate Roundtable, Boston, Massachusetts

TECHNICAL REPORTS

1. Omenzetter, P., Beskhyroun, S., Shabbir, F., Chen, G-W., Chen, X., **Wang, S.**, Zha, A. (2013). Forced and ambient vibration testing of full scale bridges: Project No. UNI/578. Earthquake Commission Research Foundation, Wellington, New Zealand

RESEARCH SUPERVISION & MENTORING

Lucas Baumgartner, M.S., 2025-current (University of Colorado Denver – main supervisor)
Rakhi Gulannavar, M.S., 2025-current (University of Colorado Denver – main supervisor)
Yaya Jallow, M.S., 2025-current (University of Colorado Denver – main supervisor)
Alkhamsa Arzouga, M.S., 2024-current (University of Colorado Denver – main supervisor)

Alycia Thomas, M.S., 2023-2025 (University of Colorado Denver – main supervisor)
Marilyn Johnson, Undergraduate, 2024-current (University of Colorado Denver – main supervisor)
Aaron Sullivan Stremel, Undergraduate, 2023-2024 (University of Colorado Denver – main supervisor)
Trevor Walker, Undergraduate, 2023-2024 (University of Colorado Denver – main supervisor)
Krisna Pawitan, Postdoctoral, 2021-2023 (Princeton University – co-supervision with Ph.D. advisor)
Hamid Eldarwich, Ph.D., 2020-2024 (Princeton University – co-supervision with Ph.D. advisor)
Gaoyuan Wu, Ph.D., 2020-2022 (Princeton University – co-supervision with Ph.D. advisor)
Melanie Galantino, M.S., 2021-2022 (Princeton University – co-supervision with Ph.D. advisor)
Vanessa Notario, M.S., 2018-2020 (Princeton University – co-supervision with Ph.D. advisor)
Audrey Yan, Undergraduate, 2021-2022 (Princeton University – co-supervision with Ph.D. advisor)
Tiffany Lim, Undergraduate, 2020-2021 (Princeton University – co-supervision with Ph.D. advisor)

GRADUATE THESIS COMMITTEES

Ryan Kaskie, M.S., Current
Benjamin Garrett, M.S., Current
Haotian Wang, Ph.D., Current
Ali Alatify, Ph.D., Graduated 2024
Paul Ishola, M.S., Graduated 2024
Abdulaziz Alqurashi, Ph.D., Graduated 2023
Keenan Foshe, MEng, Graduated 2023
Nicolas Bass, MEng, Graduated 2023
Valerie Do, MEng, Graduated 2023
Abdulsalam Alkhalaf, Ph.D., Graduated 2023
Yahya Binmahfouz, Ph.D., Graduated 2023
Ibrahim Bumadian, Ph.D., Graduated 2023
Geoff Leewaye, M.S., Graduated 2022
Haotian Wang, M.S., Graduated 2022

TEACHING

University of Colorado Denver

Spr 2025 - present — CVEN 5121: Solid Mechanics and Stress Analysis
- Primary instructor

Fall 2023 - present — CVEN 4520/5520: Structural Engineering and the Ocean Environment
- Primary instructor

Fall 2022 - present — CVEN 3121/MECH 3043: Mechanics of Materials/Strength of Materials
- Primary instructor

Princeton University

Spr 2022 — CEE 540: Structural Engineering for Climate Change Adaptation
- Course Developer

Fall 2020, Spr 2021 — CEE 478: Senior Thesis
- Colloquium Leader

Fall 2020 — CEE 440: Conceptual Design and Analysis of Structures
- Assistant in Instruction

Spr 2019, 2020, 2021 — CEE 262: Structures and the Urban Environment
- Assistant in Instruction

University of Sydney

S1 2016 — CIVL 3010: Sustainable Systems Engineering
- Academic Tutor

S2 2015, 2016 ENGG 1802: Engineering Mechanics
- Academic Tutor

SERVICE

- Reviewer for journals in fields of structural, mechanical, and ocean engineering and architecture (e.g., Thin-walled Structures, Sustainable Futures, Buildings, Journal of Asian Architecture and Building Engineering, Recent Progress in Materials, Journal of Engineering and Applied Science)
- Guest editor for Journal of Marine Science and Engineering
- Reviewer for Research and Creative Activities Symposium at the University of Colorado Denver
- Board member, Faculty Advisory Committee for the Office of Undergraduate Research & Creative Activities (URCA) at the University of Colorado Denver
- College of Engineering and Computing Scholarship Committee at the University of Colorado Denver

PROFESSIONAL MEMBERSHIPS

American Society of Civil Engineers (ASCE)
- Associate member (2022 – present)
- Student member (2017 – 2022)

Structural Engineering Institute (SEI)
- Member of the Esthetics In Design technical committee (2023 – present)

International Association for Shell & Spatial Structures (IASS)
- Member (2024 – present)