Wensi Wu (she/her/hers)

wuw4@chop.edu | *U.S. citizen*

RESEARCH INTERESTS

Multiscale Multiphysics Modeling, Atrioventricular Valve Modeling, Uncertainty Analysis, Physics-Informed Machine Learning

EDUCATION

Children's Hospital of Philadelphia — Philadelphia, Pennsylvania
Postdoctoral fellow — Sep 2021 - Now

- PI: Matthew A. Jolley

Cornell University — Ithaca, New York
Ph.D., Structural Engineering — May 2021

- Dissertation: "Theoretical Formulation for Oblique Free Surface Impact Emanating from Fluid-Structure Interaction Simulations"
- Committee: Christopher Earls (chair), Peter Diamessis, Derek Warner

M.S., Structural Engineering — 2018
B.S., Civil Engineering | *Magna Cum Laude* — 2015

JOURNAL PUBLICATIONS

1. **W. Wu**, S. Ching, S.A. Maas, A. Lasso, P. Sabin, J.A. Weiss, M.A. Jolley "A computational framework for atrioventricular valve modeling using open-source software," Journal of Biomechanical Engineering, *IN REVIEW*
2. **W. Wu**, C.J. Earls "A new engineering theory describing oblique free surface impact by flexible plates," Ocean Engineering, *IN REVIEW*
3. **W. Wu**[*], C. Bonneville[*], C.J. Earls (2020) "A principled approach to design using high fidelity fluid-structure interaction simulations," Finite Element in Analysis & Design, Vol. 194, Elsevier, 103562.
4. **W. Wu**, J.W. Kosianka, H.M. Reed, C.J. Stull, and C.J. Earls (2020) "CU-BENs: A structural finite element library," SoftwareX, Vol. 11, Elsevier, pp. 1-5.

[*] Denotes equal contribution

CONFERENCE PROCEEDING

1. P.J. Hughes, W. Scott, **W. Wu**, R.J. Kuether, M.S. Allen, and P. Tiso (2019) "Interface Reduction on Hurty/Craig-Bampton Substructures with Frictionless Contact", In: Kerschen G. (eds) Nonlinear Dynamics, Volume 1. Conference Proceedings of the Society for Experimental Mechanics Series. Springer, Cham.

CONFERENCE PRESENTATIONS

1. **W. Wu** and C.J. Earls, (2021) "Towards a Generalized Engineering Theory for Hydrodynamic Slamming Emanating from Partitioned Fluid-Structure Interaction Analysis," 16^{th} *U.S. National Congress on Computational Mechanics,* Virtual.

2. **W. Wu** and C.J. Earls, (2019) "Tightly Coupled, Partitioned Fluid-Structure Interaction Analysis of a Horizontal Plate Impact onto a Water Free Surface: Computational Framework and Validation," 15^{th} *U.S. National Congress on Computational Mechanics,* Austin, Texas.

3. **W. Wu** and C.J. Earls, (2018) "Open Source, Tightly Coupled, Partitioned Fluid-Structure Interaction Modeling Framework for Naval Applications: The Impact of Slamming Loads on High Speed Watercraft," 13^{th} *World Congress on Computational Mechanics,* New York City, New York.

4. P.J. Hughes, W. Scott, **W. Wu**, R.J. Kuether, M.S. Allen, and P. Tiso (2018) "Interface Reduction on Hurty/Craig-Bampton Substructures with Frictionless Contact," *IMAC Annual Meeting*, Orlando, Florida.

5. **W. Wu**, J.W. Kosianka, and C.J. Earls, (2017) "Open Source, Tightly Coupled, Partitoned Fluid-Structure Interaction Simulation Capability for High Spatiotemporal Resolution During Study of Wave Impact Loads in High Speed Watercraft," 14^{th} *U.S. National Congress on Computational Mechanics,* Montreal, Canada.

6. J.W. Kosianka, **W. Wu**, and C.J. Earls, (2017) "Condition Assessment and Prognosis using Fluid-Structure Interaction within a Reduced-Order Model Tracking Inversion Framework," 14^{th} *U.S. National Congress on Computational Mechanics,* Montreal, Canada.

RESEARCH EXPERIENCE

Cornell University | *Graduate Research Assistant* 2015–2021
Mentor: Dr. Christopher Earls

- Developed a simple and accurate engineering theory for hydrodynamic slamming using high fidelity fluid-structure interaction analyses.

Sandia National Laborataries | *Visiting Researcher* Summer 2017
Mentors: Dr. Robert Kuether, Dr. Matthew Allen, and Dr. Paolo Tiso

- Implemented regularized Coulomb friction subroutine to study the influence of friction in contact interface of jointed structure.

Duke University | *REU Fellow* Summer 2014
Mentor: Dr. Guglielmo Scovazzi

- Studied the resulting pressure distribution of a brain model subjected to blast loading through fluid-structure interaction simulations.

University of Cincinnati | *NSF REU Fellow* Summer 2013
Mentors: Dr. Margaret Kupferle, Dr. George Sorial

- Conducted experiments and performed comparative studies between commercial activated carbon and in-house developed activated carbon.

TEACHING EXPERIENCE

Cornell University | *Teaching Assistant* Spring 2019
CEE 4740: Introduction to The Behavior of Metal Structures

Cornell University | *Teaching Assistant* Spring 2018
CEE 4780/6780: Structural Dynamics and Earthquake Engineering

Syracuse University | *Academic Excellence Workshops Facilitator* 2012–2013
MATH 295: Calculus I
MATH 296: Calculus II

HONORS AND AWARDS

Cornell University Conference Travel Grant 2017–2019
Ve-Sing and Tseng So Koo Award 2015
NSF Sponsored Research Experiences for Undergraduates Best Overall Project 2013

SERVICE

Biomedical Postdoctoral Research Symposium at UPenn | *Abstract Reviewer* 2022

LEADERSHIP EXPERIENCE

Perelman School of Medicine, University of Pennsylvania
Biomedical Postdoctoral Council | *Career and Training Committee* 2022–Present
International High School at Prospect Heights
International Dreamers Scholarship Fund | *Selection Committee* 2018–Present
Cornell University
CEE Graduate Student Association | *Vice President* 2020–2021
Sport Taekwondo Student Club | *Treasurer* 2019–2021
Engineering TA Development Program | *TA Development Consultant* 2018–2019
CEE Graduate Student Association | *Treasurer* 2016–2017
Chi Epsilon National Civil Engineering Honor Society | *Treasurer* 2014–2015
American Society of Civil Engineers | 2013–2014
2014 ASCE Upstate NY Region Student Conference Committee

PROFESSIONAL MEMBERSHIPS

Tau Beta Pi National Engineering Honor Society
Chi Epsilon National Civil Engineering Honor Society
American Society of Civil Engineers (ASCE)