

Hongyu Zhou, PhD

Assistant Professor

Department of Civil and Environmental Engineering
5000 Technology Drive - Rm S244 (Office) - West Wing Rm 111 (Laboratory)
University of Alabama in Huntsville, Huntsville, AL35899

Email: Hongyu.Zhou@uah.edu

Phone (Cell): +1-(256)-824-5029 Fax: +1-(256)-824-6724

RESEARCH INTERESTS & AREAS OF STUDY

- Infrastructure sustainability
- Bio-inspired and biomimicry structures and materials
- Structural hazard mitigation and retrofitting
- Structural stability during early stages of construction
- Structural and materials testing technique, field testing and evaluation

EDUCATION

PhD, Arizona State University, Tempe, AZ

Dec. 2013

Civil, Sustainable, and Environmental Engineering Program

Dissertation: Development and Modeling of an Advanced Fiber Reinforced Hybrid-Matrix Composite for Structural Retrofitting and Damage Mitigation

E.I.T. License (#11865), State of Arizona

MSE, Arizona State University, Tempe, AZ

Dec 2012

Civil, Sustainable, and Environmental Engineering Program

Focus: Structural Engineering and Engineering Mechanics

Bachelor of Science, Tongji University, Shanghai, China

Jun 2010

Department of Civil Engineering

Thesis: Torsional Behavior of Reinforced High-Strength Concrete Members: Experimental and Numerical Studies (*Excellent Undergraduate Research Thesis Award*)

PROFESSIONAL EXPERIENCE

Assistant Professor, University of Alabama in Huntsville, Huntsville, AL.

Jan. 2014 - Present

Graduate Research Associate/ Teaching Associate, ASU, Tempe, AZ.

Aug 2010 - Dec. 2013

R&D Intern, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN.

May.2012 - Aug.2012

PUBLICATIONS

Peer-Refereed Journals:

Zhou, H.*, Attard, T.L., Dhiradhamvit, K., Wang, Y., and Donald, E. (2015), Crashworthiness characteristics of a carbon fiber reinforced dual-phase epoxy-polyurea hybrid matrix composite. *Composites Part B: Engineering*, 71: 17-27.

Zhou H.*, and Attard T.L. (2015), A simplified anisotropic plasticity model for analyzing the post-yield behavior of cold formed sheet-metal shear panel structures. *Journal of Structural Engineering, ASCE*. DOI: [10.1061/\(ASCE\)ST.1943-541X.0001152](https://doi.org/10.1061/(ASCE)ST.1943-541X.0001152).

Zhou H.*, Dhiradhamvit K., and Attard T.L. (2014), Tornado-borne debris impact performance of an innovative storm safe room system protected by a carbon fiber reinforced hybrid-polymer matrix composite. *Engineering Structures*, **59**:308-319.

Zhou H.*, Attard T.L., Wang Y., Wang J.A., and Ren F. (2013), Rehabilitation of notch damaged steel beam using a carbon fiber reinforced hybrid polymeric-matrix composite. *Composite Structures*, **106**(1):690-702.

Zhou H.*, Attard T.L., Zhao B., Yu J., Lu W. and Tong L. (2013), Experimental study of retrofitted reinforced concrete shear wall and concrete-encased steel girders using a new CarbonFlex composite for damage stabilization. *Engineering Failure Analysis*, **35**:219-233.

Zhou H.* and Attard T.L. (2012), Rehabilitation and strength sustainability of fatigue damaged concrete-encased steel flexural members using a newly developed polymeric carbon-fiber composite. *Composites Part B: Engineering*, **45**(1): 1091-1103.

Attard T.L.* , Wharton C.R., and **Zhou H.** (2012), Developing LH controller to model low-high velocity behavior in prototype MR damper. *Journal of Structural Engineering, ASCE*, **139**(9):1-11.

Zhou H., Attard T.L., and Mignolet M.P. Damping characterization of a graphite fiber reinforced hybrid polymer-matrix composite. *Composites Part B*. (under review)

Non-Referred Technical Reports & Articles:

Attard T.L., **Zhou H.** and. Dhiradhamvit K., Report of CarbonFlex composite for structural sustainability (*SERRI 90300*). US Department of Homeland Security, South Region Research Initiative, July 2013.

Sham T.L., Wang Y.L., Jetter R.I., **Zhou H.**, Report on progress in development of creep-fatigue design method and experimental procedure based on simplified model test approach (*ORNL/TM-2012/428*). Oak Ridge National Laboratory, Aug. 2012.

Zhou H., The comparative life cycle assessment of structural retrofit techniques. Center for Earth Systems Engineering and Management (*SSEBE-CESEM-2013-CPR-009*), Arizona State University.
(http://repository.asu.edu/attachments/108293/content/ASU_SSEBE_CESEM_2013_CPR_009.pdf)

Zhou H., Dhiradhamvit K., and Attard T.L., Enhancing the performance of safe rooms: a new composite provides superior impact resistance for storm shelter design. *Journal of High-Performance Materials*, 2013, 1(2): 32-34.

Dhiradhamvit K., Attard T.L., and **Zhou H.**, Evolutionary Viscous Damping and Energy Absorption using a New “Sustainable Negative Stiffness” Composite. *Journal of High-Performance Materials*, 2012, 1(2): 27-34.

Conference Proceedings:

Zhou H., Shen Z., and Zuo Q.H. Multiscale investigation and modeling of a carbon-fiber reinforced hybrid-polymeric matrix composite for vibration suppress. *Proc. 2014 Conference of the ASCE Engineering Mechanics Institute, McMaster University, ON, August 5 – 8, 2014.*

Zhou H., and Attard T.L., Damping characteristics and crashworthiness of carbon-fiber reinforced hybrid-polymeric matrix composite. *1st International Conference on Composite Mechanics, June 8-12, 2014, Stony Brook, NY.*

Zhou, H. and Attard, T.L. “Bridge Girder Damage Quantification and the Retrofitting,” *ASNT - NDE/NDT for Highways and Bridges: Structural Materials Technology (SMT) Conf., New York, NY, Aug 21–24, 2012.*

Zhou, H. and Attard, T.L. "Anisotropic plasticity model for the failure analysis of sheet metal structures," *Fifth International Conference on Engineering Failure Analysis (ICEFA), The Hague, The Netherlands, July 1–4, 2012.*

Zhou, H. and Attard, T.L. "Strength and ductility analysis of fatigue damaged concrete-encased steel girders rehabilitated using CFRP and a newly developed CarbonFlex composite," *Fifth International Conference on Engineering Failure Analysis (ICEFA), The Hague, The Netherlands, July 1–4, 2012.*

Zhou, H. and Attard, T.L. "Seismic damage mitigation of already-damaged steel-encased reinforced concrete beams and shear walls," *Proc. 11th European Conference of Civil Engineering (ECCIE'11), Puerto De La Cruz, Tenerife, Spain, December 10–12, 2011.*

Dhiradhamvit, K. Attard, T.L., and **Zhou, H.** "Development of a New Lightweight 'Rubberized-Carbon' Composite for Wood Home Protection." *Proc. 1st Intl Conf on Construction, Architecture and Engineering, Athens, Greece, June 20–21, 2011.*

AWARDS & FELLOWSHIPS

2014	Individual Investigator Distinguished Research Award	University of Alabama in Huntsville
2012	Higher Education Research Experience Fellowship	ORAU
2012,13	Graduate Travel Award	Arizona State University
2010	Outstanding Thesis Award	Tongji University
2009	Tongji Scholarship for Academic Excellence	Tongji University

FUNDED Research PROJECTS

Alabama Department of Transportation	12/15 – 10/16	\$88,751	"Construction Locked-in Force due to Different Cross-Frame Detailings - Phase I: Field Evaluation" H. Zhou, PI.
Alabama Department of Transportation	05/15 – 10/16	\$181,915	"Stability of Horizontally Curved I-Girder Bridges During Early-Stage Construction" H. Zhou, PI.
UA System Collaborative Research	01/15 – 12/15	\$5,000	"Ultra-lightweight Materials using Nano Surface-Engineered Polymeric Aerogel and In-situ Produced Carbon Nanotubes for Structural Application and Energy Storage." H. Zhou, PI., Yu Lei, co-PI, Jialai Wang (PI, UA)
University of Alabama in Huntsville – New Faculty Research	01/15 – 12/15	\$10,000	"NFR/Sustainable Bamboo Fiber Composites for Civil Infrastructural Applications." H. Zhou, PI.
UAH - Individual Investigator Distinguished Research	05/14 – 04/15	\$49,967	"Development of a New Generation of Bioinspired Multifunctional Composites - From Microstructure to Structural Applications" H. Zhou, PI.
UAH - Research Infrastructure Fund	05/14 – 04/15	\$149,925	"Establishing the Infrastructure Hazard Mitigation and Intelligent Materials Laboratory for Interactive Research on Civil Structures and Infrastructural Materials" H. Zhou, PI.
DHS/DOE - Higher Education Research Experience (HERE)	05/12 – 09/12	\$35,000	"Microstructure and Failure Mechanisms of Fiber-Reinforced Hybrid-Matrix Composite", H. Zhou, P.I.
Chinese National Innovation Program	05/12 – 09/12	CNY30,000	"Torsional Properties of Reinforced High-strength Concrete Beams", H. Zhou, P.I.

TEACHING, ADVISING & OUTREACH

Teaching:

CE101 – Prelude to Civil Engineering (F14), FYE101 – First Year Experience (F15)
CE372 – Soil Mechanics and Foundation (S,F14, S,F15), CE373 – Soil Mechanics Lab.,
CE485/585 – Foundation Engineering (S14, S15)

Faculty Advisor:

ASCE Student Chapter, University of Alabama in Huntsville (2015-present)

Outreach activities:

Co-organizer, UAH Be an Engineering Student (BEST) Experience Summer Camp (Smr.14, 15). The week-long summer camp enrolls ~40 high school students each year and it gives high-school students a taste of what being an engineer student at UAH is all about. Students will go to engineering classes, perform hands-on experiments in engineering labs, participate in UAH student life activities, and work on project teams.
Engineering Open House Events (F14, S15, F15)

LABORATORY FACILITY DEVELOPMENT

Infrastructure Hazard Mitigation and Intelligent Materials Laboratory, Founding Coordinator, UAH

- Multi-functional structural loading frame (test structures up to 18 feet in span and 8 feet in height) equipped with 55-kip, 20-inch stroke actuators (MTS244);
- MTS - 810 Materials Testing System - 110-kip (500kN) Capacity;
- MTS Insight Electromechanical Testing System
- VIC-2D Digital Image Correlation System for Strain Field Measurement
- National Instrument PXI Express Data Acquisition Deck
- Environmental Chambers for Durability Studies

Pseudo-Dynamic Testing Facility for Structural Seismic Studies, *High Performance Building Material Laboratory*
Arizona State University

- Designed the lab loading frame system with 75 kips lateral and 150 kips vertical loading capacity that can load structural components as high as eight feet;
- Built a comprehensive measuring and data acquisition system consists up to two load cell, five LVDT/potentiometer, four accelerometer/ acoustic emission sensors, and sixteen strain gauge channels;
- Incorporated non-contacted censoring techniques such as 3-D laser scanning and digital imaging correlation (DIC) into structural testing.

Combined Flexural, Shear, and Cyclic Torsional Loading System for Reinforced Concrete Structural Components,
Building Engineering Structural Laboratory, Tongji University

- Design and development of a combined 250 kN-m flexural, 100 kN shear, and 25kN-m cyclic torsional capacity loading device for reinforced concrete structural members.

AFFILIATIONS & PROFESSIONAL SERVICE

Committee Service:

Member, SEI Multihazard Mitigation Committee, ASCE Structural Engineering Institute (2015-present).
Member, Technical Committee on Advanced Materials and Structures, ASCE Aerospace Division (2014-present).

Member:

American Associate of Civil Engineers (ASCE)

American Concrete Institute (ACI)
American Institute of Steel Construction (AISC)
Prestressed Concrete Institute (PCI)

Journal Reviewer:

Composites Part B: Engineering, Elsevier
Composite Structures, Elsevier
Engineering Structures, Elsevier
Structural Health Monitoring, SAGE Publication
Journal of Structural Engineering, ASCE
Journal of Materials for Civil Engineering, ASCE
Journal of Civil Engineering, KSCE
International Journal of Theoretical and Applied Multiscale Mechanics, InderScience Publishers