

Wenqiong Tu

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Summary of Qualifications

- Extensive experience (6 years) in structural and stress analysis via various finite element software
 - Extensive experience (6 years) in programming and code development for solid mechanics applications
 - Deep understanding of analysis and design of various structures
 - Proven record with 6 peer-reviewed journal articles in composite materials, structural analysis, fracture and fatigue, dynamic analysis, non-linear analysis, plasticity, optimization, biomechanics
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Education

University of Virginia (UVA), PhD (Expected in May 2015) Charlottesville, VA, US

➤ Applied mechanics; GPA 3.9/4.0

Huazhong University of Science and Technology (HUST) Wuhan, China

➤ **B. S.** in Engineering Mechanics, 2008, GPA 3.7/4.0; **M. S.** in Solid Mechanics, 2010, GPA 3.8/4.0

Skills: ANSYS, LS-DYNA, Abaqus, HyperMesh, Python, Matlab, Fortran, Linux, Unix, AutoCAD

Work Experience

➤ **Applied mechanics, UVA** Charlottesville, VA

Graduate Research Assistant January 2011- present

- **“Modeling of the mechanical response of periodic composite materials with Abaqus”**
 - Utilized python to create periodic unit cell with required microstructures and post-process output data.
 - Modeled the mechanical responses (elastic-plastic, damage, hyperelastic) of polymer and metal matrix composites and biomimetic materials.
- **“Investigation of damage evolution in composite materials with finite volume homogenization”**
 - Developed a numerical tool in modeling crack initiation and growth with high efficiency and excellent stability.
 - Simulated fiber/matrix debonding in SiC/Ti composites and damage evolution in cross-ply laminates.
 - One peer-reviewed article has been published and two sequential papers are in the writing process.
- **“Teaching assistant in statics and strength of materials”**
 - Developed a deep understanding of design and analysis of various structures, such as truss, beam, frame structures.
 - Tutored students and assisted professor with classroom instruction, exams, and other miscellaneous projects.

➤ **Solid mechanics, HUST** Wuhan, China

Graduate Research Assistant September 2008-November 2010

- **“Study of the delamination of fiber/Aluminum laminates under low-velocity impact”**
 - Simulated delamination between single plies via Cohesive Zone Model (CZM) in LS-DYNA.
 - Quantitated plastic effects of Al plies in absorbing impact energy and in reducing delamination between plies.
 - Identified the preferred stacking sequence for laminates with strong delamination resistance.
- **“Strength analysis and optimization of Carbon Fiber Reinforced Plastic (CFRP) joints”**
 - Designed CFRP joints with AutoCAD and created 3D finite element model in ANSYS.
 - Predicted the delamination bearing strength of CFRP joints considering contact effects.
 - Optimized the delamination bearing strength via PSO approach by varying ply angles.

Undergraduate Research Assistant May 2007-June 2008

- **“Stress and strength analysis of tube connections on air cooled heat exchanger”**
 - Built 3D finite element model in ANSYS from technical drawing provided by collaborated company.
 - Carried out stress analysis to check stress distribution at tube connections and verified the strength of steel.

Journal Articles

- **W. Tu** and M. J. Pindera, 2015. Damage Evolution in Cross-Ply Laminates Revisited via CZM-Based Finite-Volume Homogenization (in preparation).
- A. Katz, C. Trinh, J. Wright, **W. Tu**, M. J. Pindera, Plastic Strain Localization in Periodic Materials with Wavy Brick-and-Mortar Architectures and Its Effect on the Homogenized Response, *Composites Part B: Engineering*, 2015,68,270-278.
- **W. Tu** and M. J. Pindera, Cohesive Zone-Based Damage Evolution in Periodic Materials via Finite-Volume Homogenization, *Journal of Applied Mechanics*, 2014, 81: 101005(1-16).
- **W. Tu** and M. J. Pindera, Targeting the Finite-deformation Response of Wavy Biological Tissues with Bio-inspired Material Architectures, 2013, *Journal of the Mechanical Behavior of Biomedical Materials*, 2013, 28: 291-308.
- **W. Tu**, J. Chen, J. Wei, Study on the Delamination of Fiber-metal Laminates under Low-velocity Impact, *Chinese Journal of Solid Mechanics*, 2012, 33(2): 182-188.
- W. Peng, J. Chen, J. Wei., **W. Tu**, Optimal Strength Design for Fiber Metal Laminates, *Journal of Composite Materials*, 2010, 45: 237-254.
- W. Peng, J. Chen, M. Gu, **W. Tu**, A Particle Swarm Optimization(PSO) Algorithm for Minimizing Interlaminar Normal Stresses at the Free-edge of Composite laminates, *Mechanical Science and Technology for Aerospace Engineering*,2009, 28(11):1496-1500.

Selected Conference Presentations

- **W. Tu** and M. J. Pindera, A Unified Methodology for the Homogenization of Periodic Materials with Damage, *Proceedings of the 4th International Conference on Integrity, Reliability and Failure*, 23-27 June 2013, Funchal, Portugal, pp. 793-794.
- **W. Tu**, Z. Tang, M.J. Pindera, Interfacial Damage Mechanics of Composite Materials Via Finite-Volume Micromechanics, 20th Annual International Conference on Composite Materials, July 22-28, 2012, Beijing, CHINA.
- M.J. Pindera, **W. Tu**, M. Cavalcante, K. Bixel, Microstructural Effects in Tailoring the Response of Engineered Bio-Materials, 2012 NSF CMMI Engineering Research and Innovation Conference, July 9–12, Boston.

Journal Reviews

- *Journal of Reinforced Plastics and Composites*

Honors and Awards

- Travel Award for Graduate Students (2012) - University of Virginia
- Excellent Master Thesis in Hubei Province, China (2011)
- Excellent Graduate Student (2009) - Huazhong Univ. of Sci. & Tech
- Excellent undergraduate (2008) - Huazhong Univ. of Sci. & Tech
- Excellent Thesis of Undergraduate (2008) - Huazhong Univ. of Sci. & Tech