

University of Michigan, Ann Arbor, MI

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SUMMARY OF QUALIFICATIONS

- ~5 years' **research** experience on **structural health monitoring, numerical simulation, etc.**
- ~3 years' **research** experience on **flight/space dynamics, adaptive/robust control, space robots, etc.**
- ~3 years' **laboratory** experience of **composite manufacturing, laser vibrometry, HPC maintenance, etc.**
- ~5 years' **programming** experience on **physics simulation, data analysis, multi-GPU parallelization, etc.**

EDUCATION

- Ph.D. degree in Aerospace Engineering, GPA **4.0/4.0** **May 2016 – May 2019**
University of Michigan, Ann Arbor, USA
Thesis: Wave Modeling and Propagation in Aerospace Structure (advisor: Carlos E. S. Cesnik)
- Master degree in Aerospace Engineering, GPA **4.0/4.0** **Sept. 2014 – Apr. 2016**
University of Michigan, Ann Arbor, USA
Coursework: structural mechanics/dynamics/stability, composite mechanics, finite element analysis, etc.
- Ph.D. candidate in Applied Mathematics (**discontinued**), GPA **3.91/4.0** **Sept. 2011 – Jun. 2014**
Beihang University (BUAA), Beijing, China
Coursework: numerical analysis, statistics & random processes, machine learning, parallel computation, etc.
- Bachelor degree in Aerospace Engineering, GPA **3.74/4.0**, Rank **2/198** **Sept. 2007 – Jun. 2011**
Beihang University (BUAA), Beijing, China
Coursework: flight/space dynamics, aerodynamics, embedded system, structural design, heat transfer, etc.

EXPERIENCE

- Research Assistant**, University of Michigan **Sept. 2014 – Apr. 2019**
 - Developed a multiple GPU parallelized numeric solver (UM/LISA) outperforming ANSYS by ~100x.
 - Developed characterization framework based on large simulation database (~10 GB) for damage detection.
 - Collaborated with 2 separate research groups to apply UM/LISA and developed multiple enhancements.
 - Advised 3 master students separately in directed study courses and helped them build experimental skills.
 - Developed a semi-analytic finite element (SAFE) solver with mode tracking for dispersion computation.
 - Manufactured & tested carbon fiber composite plates with embedded inserts for delamination characterization.
- Lab Manager**, University of Michigan **May 2017 – Jun. 2018**
 - Documented lab inventory of instrumentations, chemicals and tools; tracked major equipment operations, loans & returns; managed operations of laser vibrometry & maintenance of GPU HPC server.
- Graduate Student Instructor**, University of Michigan **Sept. 2017 – Dec. 2018**
 - Prepared undergraduate's structural mechanics course, including designing homework/exams, grading, etc.
 - Assisted students in understanding the course materials, including holding office hours and review class.
- Student Group Leader**, Beihang University (BUAA) **Sept. 2010 – May 2011**
 - Led a team of four, in charge of designing and testing electronic circuits for an automated model car for route tracking, based on magnetic sensors and PID guidance laws.

SKILLS (Proficiency: 1-5)

- **Coding:** C/C++ (5), CUDA (4), MATLAB (5), Python (3), Makefile (4), CMake (3), Linux (4), TensorFlow (3)
- **Software:** ANSYS (APDL) (4), Abaqus (3), COMSOL(2), Visual Studio (5), Tecplot (5)
- **Others:** Technical report (4), Oral presentation (4), GPU HPC computing (5), Lab instrumentations (5)

AWARDS AND ACTIVITIES

- China National Scholarship, 2009.
- Finalist in the Data Incubator Program, 2019.
- I've ran the Beijing International Marathon in 2013, finishing in 4 hours 15 mins.
- I've cycled ~150 km in a single day from Beijing to Tianjin in 2014.
- Interests in Android app developments, game development in Unreal Engine.

PUBLICATIONS

- **Hui Zhang**, Yanfeng Shen, Carlos E. S. Cesnik, "Effective non-reflective boundary techniques for efficient simulation of guided wave propagation". (Ready for submission, 2019).
- **Hui Zhang**, Carlos E. S. Cesnik, "Damage characterization of delamination in composite plate based on nonlinear guided wave simulation with experimental validation". (Under preparation, 2019).
- Wei Huang, **Hui Zhang**, Daniel J. Inman, Jinhao Qiu, Carlos E. S. Cesnik, Hongli Ji, "Low reflection effects by 3D-printed functionally graded acoustic black holes", Journal of Sound and Vibration (2019).
- Wentao Wang, **Hui Zhang**, Jermone P. Lynch, Carlos E. S. Cesnik, Hui Li, "Experimental and numerical validation of guided wave phased arrays integrated within standard data acquisition systems for structural health monitoring", Struct Control Health Monit (2018).
- Wei Huang, **Hui Zhang**, Hongli Ji, Carlos E. S. Cesnik, Jinhao Qiu, Daniel J. Inman, "Numerical Analysis of Wave Propagation in Functionally Graded 1-D Acoustic Black Hole via Viscoelastic Local Interaction Simulation Approach, INTER-NOISE (2018).
- **Hui Zhang**, Carlos E. S. Cesnik, "Damage characterization based on nonlinear guided wave simulation and chirplet matching pursuit algorithm". Proc. SPIE 9805, Health Monitoring of Structural & Biological Systems (2018).
- Wentao Wang, **Hui Zhang**, Jerome P. Lynch, Carlos E. S. Cesnik, Hui Li, "Numerical and experimental simulation of linear shear piezoelectric phased arrays for structural health monitoring", Proc. SPIE 10169, Nondestructive Characterization & Monitoring of Advanced Materials, Aerospace, & Civil Infrastructure (2017).
- **Hui Zhang**, Carlos E. S. Cesnik, "A hybrid non-reflective boundary technique for efficient simulation of guided waves using local interaction simulation approach", Proc. SPIE 9805, Health Monitoring of Structural and Biological Systems, 98050U (2016).

POSTER PRESENTATIONS

- UM/LISA: efficient linear and nonlinear guided wave simulation, Michigan Institute for Computational Discovery & Engineering (MICDE) Annual Symposium, University of Michigan, Ann Arbor, MI, Mar. 22, 2018.
- Big data for damage characterization of aerospace structures, MIDAS Data Science Research Forum, University of Michigan, Ann Arbor, MI, Dec. 1, 2017.
- GPU parallelized modeling of ultrasonic wave propagation using Local Interaction Simulation Approach, Michigan Institute for Computational Discovery & Engineering (MICDE) Annual Symposium, University of Michigan, Ann Arbor, MI, Apr. 7, 2016.