



Mohammad Faisal Haider

Postdoctoral Research Fellow, Aeronautics and Astronautics

Bio

BIO

I am a research-oriented professional with more than ten years of research experience contributing to piezoelectric sensors, composite materials, dielectric materials, the multi-physics behavior of composite materials, structural sensing, and sensor methods for SHM/NDE. I have earned my Ph.D. and M.S. from the University of South Carolina. Currently, I am working as a Postdoctoral Fellow in Aeronautics & Astronautics Department at Stanford University.

Research Interest:

- AI-enabled Structural health monitoring (SHM) / Non-destructive evaluation (NDE) of aerospace, mechanical, infrastructure, and civil structures
- Multi-functional intelligent structures in aerial vehicles
- Multi-modal sensors network to assess the in-flight condition of aerospace/defense structures
- Virtual inspection of aerospace structures using physics-based-deep neural network modeling
- Acousto-ultrasonic wave-based framework (using machine learning methods and particle filtering) in conjunction with micro-structure study to evaluate the chemomechanical evolution of Lithium-ion batteries for unmanned/ ground electrical vehicle applications
- Multi-functional composite energy storage systems
- Manufacturing of multi-functional heterogeneous structural composites and studying their multi-physics behavior

HONORS AND AWARDS

- Preparing for Faculty Careers (PFC) Certificate, Office of Postdoctoral Affairs, Stanford University (2020)
- Engineering in Training Certificate, Certificate # 20989, South Carolina State Board of Registration (2019)
- Preparing Future Faculty (PPF) Certificate, University of South Carolina (2019)
- Top Peer Reviewer (top 1% of reviewers in cross-field on Publons global reviewer database), Publons (2019)
- Two Thumbs Up Award (for making a significant difference as a faculty in students experience), University of South Carolina (2019)
- 1st Position in Video Category (SAMPE 2018 bridge contest), SAMPE (2018)
- Breakthrough Graduate Scholar, Office of the Vice President for Research, University of South Carolina (2018)
- C.C. Royal Graduate Fellowship, University of South Carolina (2018)
- Outstanding Paper Award (Third place), SAMPE Conference (2013)
- Travel Grant Scholarship, Bangladesh-Sweden trust fund (2013)

STANFORD ADVISORS

- Fu-Kuo Chang, Postdoctoral Faculty Sponsor

PATENTS

- Mohammad Faisal Haider. "United States Patent US 10,983,095 B2 Combined Global-Local Structural Health Monitoring", University of South Carolina, Apr 20, 2021

LINKS

- Google Scholar: <https://scholar.google.com/citations?user=uh7a8QMAAAAJ&hl=en>

Research & Scholarship

PROJECTS

- Multifunctional Energy Storage Composites (MESc) - Stanford University (10/2009 - present)
- Brain-Inspired Networks for Multifunctional Intelligent Systems in Aerial Vehicles - UCLA U. Michigan, Ann Arbor, Stanford University, Texas A&M, U. Massachusetts, Amherst & U. Tennessee (8/2019 - present)
- Integrated Acoustic Technology for Boil-off Control, Mass Gauging, and Structural Health Monitoring in Cryogenic Fuel Tanks - Stanford University, NASA, Universitat Politècnica de Catalunya-BarcelonaTech, Spain (4/2021 - present)
- Development of Multi-functional Composite UAV Structures for Urban Operations (4/2021 - present)

Publications

PUBLICATIONS

- **Guided wave field calculation in anisotropic layered structures using normal mode expansion method** *SMART STRUCTURES AND SYSTEMS*
Li, L., Mei, H., Haider, M., Rizos, D., Xia, Y., Giurgiutiu, V.
2020; 26 (2): 157-174
- **Pure S0 and SH0 detections of various damage types in aerospace composites** *COMPOSITES PART B-ENGINEERING*
Mei, H., Haider, M., James, R., Giurgiutiu, V.
2020; 189
- **Design and Integration of a Wireless Stretchable Multimodal Sensor Network in a Composite Wing.** *Sensors (Basel, Switzerland)*
Chen, X., Maxwell, L., Li, F., Kumar, A., Ransom, E., Topac, T., Lee, S., Faisal Haider, M., Dardona, S., Chang, F.
2020; 20 (9)
- **Theoretical calculation of circular-crested Lamb wave field in single- and multi-layer isotropic plates using the normal mode expansion method** *STRUCTURAL HEALTH MONITORING-AN INTERNATIONAL JOURNAL*
Li, L., Haider, M., Mei, H., Giurgiutiu, V., Xia, Y.
2020; 19 (2): 357-372
- **Multimode Guided Wave Detection for Various Composite Damage Types** *APPLIED SCIENCES-BASEL*
Mei, H., James, R., Haider, M., Giurgiutiu, V.
2020; 10 (2)
- **Static Tactile Sensing for a Robotic Electronic Skin via an Electromechanical Impedance-Based Approach.** *Sensors (Basel, Switzerland)*
Liu, C. n., Zhuang, Y. n., Nasrollahi, A. n., Lu, L. n., Haider, M. F., Chang, F. K.
2020; 20 (10)
- **An efficient analytical global-local (AGL) analysis of the Lamb wave scattering problem for detecting a horizontal crack in a stiffened plate** *ACTA MECHANICA*
Haider, M., Joseph, R., Giurgiutiu, V., Poddar, B.
2020; 231 (2): 577-596
- **Theoretical and numerical analysis of acoustic emission guided waves released during crack propagation** *JOURNAL OF INTELLIGENT MATERIAL SYSTEMS AND STRUCTURES*

Haider, M., Giurgiutiu, V.

2019; 30 (9): 1318-1338

- **Vibration-Based In-Situ Detection and Quantification of Delamination in Composite Plates** *SENSORS*
 Mei, H., Migot, A., Haider, M., Joseph, R., Bhuiyan, M., Giurgiutiu, V.
 2019; 19 (7)
- **Recent Advances in Piezoelectric Wafer Active Sensors for Structural Health Monitoring Applications** *SENSORS*
 Mei, H., Haider, M., Joseph, R., Migot, A., Giurgiutiu, V.
 2019; 19 (2)
- **Propagating, Evanescent, and Complex Wavenumber Guided Waves in High-Performance Composites** *MATERIALS*
 Giurgiutiu, V., Haider, M.
 2019; 12 (2)
- **Experimental validation of an analytical method to predict lamb wave scattering from a discontinuity** *SMART MATERIALS AND STRUCTURES*
 Haider, M., Poddar, B., Giurgiutiu, V.
 2019; 28 (1)
- **Analytical and experimental investigation of the interaction of Lamb waves in a stiffened aluminum plate with a horizontal crack at the root of the stiffener** *JOURNAL OF SOUND AND VIBRATION*
 Haider, M., Bhuiyan, M., Poddar, B., Lin, B., Giurgiutiu, V.
 2018; 431: 212-225
- **Nonlinear anisotropic electrical response of carbon fiber-reinforced polymer composites** *JOURNAL OF COMPOSITE MATERIALS*
 Haider, M. F., Majumdar, P. K., Angeloni, S., Reifsnider, K. L.
 2018; 52 (8): 1017-1032
- **Analysis of axis symmetric circular crested elastic wave generated during crack propagation in a plate: A Helmholtz potential technique** *INTERNATIONAL JOURNAL OF SOLIDS AND STRUCTURES*
 Haider, M., Giurgiutiu, V.
 2018; 134: 130-50
- **A Helmholtz potential approach to the analysis of guided wave generation during acoustic emission events** *Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems*
 Faisal Haider, M., Giurgiutiu, V.
 2018; 1 (2)
- **Irreversibility effects in piezoelectric wafer active sensors after exposure to high temperature** *SMART MATERIALS AND STRUCTURES*
 Haider, M., Giurgiutiu, V., Lin, B., Yu, L.
 2017; 26 (9)