

Stanford



jingxiao liu

- Ph.D. Student in Civil and Environmental Engineering, admitted Winter 2020
- Ph.D. Minor, Electrical Engineering
- 📄 Curriculum Vitae available Online

Bio

BIO

The main objective of my research is to develop physics-guided data-driven approaches for drive-by SHM that are scalable to a large stock of structures without requiring training data from every structure. My prior works on this topic have the following accomplishments: 1) Based on the physical understandings of vehicle-structure interaction systems, I have developed damage localization and quantification algorithms for drive-by SHM of bridges and an anomaly detection algorithm for railroad track geometry monitoring. I have published my work in top-tier conferences and journals in both civil and electrical engineering. 2) Collaborating with Port Authority of Allegheny County, I have conducted real-world deployments and multiple field experiments on a light rail system, including a 42.2-km railroad track and multiple bridges, to validate the robustness of my approaches with more complex and realistic infrastructure. I have published a comprehensive dataset collected from vehicles in this light rail system, which is the first open-access dataset for drive-by SHM.

HONORS AND AWARDS

- Leavell Fellowship on Sustainable Built Environment, Civil and Environmental Engineering, Stanford University (2020)
- Dean's Fellowship, College of Engineering, Carnegie Mellon University (2018)

EDUCATION AND CERTIFICATIONS

- M.S., Carnegie Mellon University, Civil Engineering (2017)

Publications

PUBLICATIONS

- **Predicting peak stresses in microstructured materials using convolutional encoder-decoder learning** *MATHEMATICS AND MECHANICS OF SOLIDS*
Shrivastava, A., Liu, J., Dayal, K., Noh, H.
2022
- **Diagnosis algorithms for indirect structural health monitoring of a bridge model via dimensionality reduction** *MECHANICAL SYSTEMS AND SIGNAL PROCESSING*
Liu, J., Chen, S., Berges, M., Bielak, J., Garrett, J. H., Kovacevic, J., Noh, H.
2020; 136
- **DAMAGE-SENSITIVE AND DOMAIN-INVARIANT FEATURE EXTRACTION FOR VEHICLE-VIBRATION-BASED BRIDGE HEALTH MONITORING**
Liu, J., Chen, B., Chen, S., Berges, M., Bielak, J., Noh, H., IEEE
IEEE.2020: 3007–11
- **Dynamic responses, GPS positions and environmental conditions of two light rail vehicles in Pittsburgh** *SCIENTIFIC DATA*
Liu, J., Chen, S., Lederman, G., Kramer, D. B., Noh, H., Bielak, J., Garrett, J. H., Kovacevic, J., Berges, M.
2019; 6: 146

- **A Damage Localization and Quantification Algorithm for Indirect Structural Health Monitoring of Bridges Using Multi-Task Learning**

Liu, J., Berges, M., Bielak, J., Garrett, J. H., Kovacevic, J., Noh, H., Bond, L. J., Holland, S., Laflamme, S.

AMER INST PHYSICS.2019

- **Detecting Anomalies in Longitudinal Elevation of Track Geometry Using Train Dynamic Responses via a Variational Autoencoder**

Liu, J., Wei, Y., Berges, M., Bielak, J., Garrett, J. H., Noh, H., Lynch, J. P., Huang, H., Sohn, H., Wang, K. W.

SPIE-INT SOC OPTICAL ENGINEERING.2019