

Alex Ogren

Mechanical Engineering ▪ Computer Vision ▪ Machine Learning ▪ aco8ogren.github.io ▪ github.com/aco8ogren

Experience

California Institute of Technology

Postdoctoral Scholar

Pasadena, California

May 2024 – Present

Developed *Visual Surface Wave Elastography*, a method for inferring subsurface mechanical properties via visible surface waves with monocular video.

Meta Reality Labs

Research Engineer Intern

Redmond, Washington

May 2022 – Sept 2022

Researched elastic wave propagation in biological layered media for haptics and human-computer interaction.

ATA Engineering

Graduate Engineer Intern

San Diego, California

May 2018 – Sept 2018

Performed structural analysis (FEA) for theme park and aerospace applications.

University of Wisconsin–Madison

Undergraduate Researcher

Madison, Wisconsin

Aug 2017 – May 2018

Researched biomechanical properties of the extracellular matrix, and its influence on cell behavior.

CommScope

Undergraduate Engineer Intern

Shakopee, Minnesota

May 2017 – Aug 2017

Developed software to automate the calibration of fiber optic testing equipment.

Proficiencies

Coding : MATLAB; Python; Maple; Visual Basic; JavaScript; HTML; CSS

ML & Inference : Gaussian process models; physics-based inverse modeling; neural network models

Finite Element (my libraries) : 2D-dispersion; 3D-dispersion-matlab; tissue-dispersion

Finite Element (commercial) : COMSOL Multiphysics; NX Nastran; Abaqus; ANSYS

3D Modeling : SolidWorks; Siemens NX; Autodesk AutoCAD

Tools : Git

Languages : Spanish

Education

California Institute of Technology

Ph.D. Mechanical Engineering

Pasadena, California

May 2024

University of Wisconsin–Madison

B.S. Engineering Mechanics; B.S. Mathematics

Madison, Wisconsin

May 2018

Publications

- **A.C. Ogren**, B.T. Feng, J. Ahn, K.L. Bouman, C. Daraio. "Visual Surface Wave Elastography: Revealing Subsurface Physical Properties via Visible Surface Waves." *International Conference on Computer Vision (ICCV)*, 2025. [arXiv:2507.09207v1](https://arxiv.org/abs/2507.09207v1)
- M.V. Bastawrous, Z. Chen, **A.C. Ogren**, C. Daraio, C. Rudin, L.C. Brinson. "Phononic materials with effectively scale-separated hierarchical features using interpretable machine learning." *Computer Methods in Applied Mechanics and Engineering (CMAME)*, 2024. [arXiv:2408.08428](https://arxiv.org/abs/2408.08428).
- **A.C. Ogren**, B.T. Feng, K.L. Bouman, C. Daraio. "Gaussian Process Regression as a Surrogate Model for the Computation of Dispersion Relations." *Computer Methods in Applied Mechanics and Engineering (CMAME)*, 2024. [doi:10.2139/ssrn.4546650](https://doi.org/10.2139/ssrn.4546650).
- B.T. Feng, **A.C. Ogren**, C. Daraio, K.L. Bouman. "Visual Vibration Tomography: Estimating Interior Material Properties from Monocular Video." *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2022. *Best Paper Honorable Mention*. [doi:10.48550/arXiv.2104.02735](https://doi.org/10.48550/arXiv.2104.02735).
- Z. Chen, **A.C. Ogren**, C. Daraio, L.C. Brinson, C. Rudin. "How to See Hidden Patterns in Metamaterials with Interpretable Machine Learning." *Extreme Mechanics Letters (EML)*, 2022. [doi:10.48550/arXiv.2111.05949](https://doi.org/10.48550/arXiv.2111.05949).
- M. Proestaki, **A.C. Ogren**, B. Burkel, J. Notbohm. "Modulus of Fibrous Collagen at the Length Scale of a Cell." *Experimental Mechanics*, 2019. [doi:10.1007/s11340-018-00453-4](https://doi.org/10.1007/s11340-018-00453-4).