

Xiangbei Liu

📍 15 Thayer Dr, Hanover, NH 03755 ✉ xiangbei.liu.th@dartmouth.edu ☎ 949-307-7176 📁 Portfolio in LinkedIn

OBJECTIVE

Researcher with a strong engineering background and expertise in deep learning, large language models, and data-driven optimization, seeking a Machine Learning Engineer opportunity.

EDUCATION

Dartmouth College, Ph.D. Candidate in Engineering Aug 2022 – Expected Jun 2026
Awarded 2025 Neukom Prize for Outstanding Graduate Research in Computational Science
Awarded 2022 Dean's Fellowship at Thayer School of Engineering
University of California, San Diego (UCSD), M.S. in Mechanical Engineering Sept 2020 - Aug 2022
GPA 3.88/4.0 San Diego, CA
Dalian University of Technology (DUT), B.S. in Mechanical Engineering Sept 2016 - Jun 2020
GPA 3.64/4.0, *Graduated in the top 5% of the class* Dalian, China

SKILLS

Languages: Python, C++, C, SQL, JavaScript, MATLAB, APDL, R

Tools: PyTorch, Tensorflow, Git, Docker, CUDA, AWS, Spark, ANSYS, Abaqus, LabView, SolidWorks, AutoCAD, SLA, SEM

EXPERIENCE

Research Assistant, Thayer School of Engineering, Dartmouth College Aug 2022 – Present

- Devising an LLM-based model enabling interactive design of high-entropy alloy properties (*Funded by Sandia*)
- Designed transfer learning strategies to accelerate metamaterial property calculations, achieving the same accuracy while using only **5% of the data**, and built a JavaScript-based web page to visualize the design (*Funded by NSF*)
- Invented a few-shot learning-based variational autoencoder, effectively utilizing an extremely unbalanced dataset, leading to a **130-fold** increase in generative efficiency (*Funded by NSF*)
- Developed a genetic algorithm to optimize titanium processing parameters, improving mechanical properties **by 50%**
- Designed, prototyped, and 3D printed piezoelectric and thermoelectric materials and devices, achieving a **10× increase** in sensitivity and **66% higher** energy harvesting efficiency (*Funded by NASA*)

Research Assistant, Jacobs School of Engineering, UCSD Sept 2020 – Aug 2022

- Devised a reconstruction-error-minimizing generative adversarial network for airfoil shape parameterization, achieving **over 20%** improvement in capturing the design space of real airfoils (*Funded by NASA*)
- Implemented a modified Sobolev-trained neural network to predict aerodynamic coefficients for airfoil designs, improving predictive accuracy **by 16%** compared to the benchmark model
- Collaborated on developing an open-source framework for non-matching isogeometric shell coupling implemented on Linux with Docker deployment for scalability, achieving a **~200×** reduction in computational cost compared to classical FEM.
- Developed the API and implementation code for a Python-C++ integrated package of a parametrically-driven geometry modeler for generating unstructured meshes and streamlining the eVTOL design process (*Funded by NASA*)

Undergraduate Researcher, University of California, Irvine Sept 2019 - June 2020
3+1 Study Abroad Program, GPA: 3.78/4.0

- Implemented real-time trajectory control and navigation algorithms for UAVs
- Conducted microfabrication and mechanical characterization of micro-resonators for semiconductor and MEMS applications

Undergraduate Researcher, School of Mechanical Engineering, DUT Sept 2017 - Mar 2019

- Implemented a MATLAB backpropagation neural network to predict long-term population distribution geographical spread of speakers for ten languages; awarded *Honorable Mention in Interdisciplinary Contest in Modeling (USA)*
- Engineered a lightweight gantry for obstacle avoidance and target capture and programmed using an STM32 microcontroller; awarded *Second-class Prize in National College Mechanical Innovation Design Competition (China)*

SELECTED PUBLICATIONS (Cited 78 times)

Liu, X., Zhao, H., et al. (2024). Few-shot learning-based generative design of metamaterials with zero Poisson's ratio. *Materials & Design*, 113224.

Ruh, M. L., Liu, X., et al. (2023). Airfoil shape parameterization using reconstruction-error-minimizing generative adversarial networks. In *AIAA AVIATION 2023 Forum* (p. 3722).

Zhao, H., Liu, X., et al. (2022). An open-source framework for coupling non-matching isogeometric shells with application to aerospace structures. *Computers & Mathematics with Applications*, 111, 109-123.

COMMUNITY INVOLVEMENT

Vice President of Client Network & Outreach, Dartmouth Graduate Consulting Group Sept 2023 – Present

- Developed a sustainable business model for an AI-clone video creation platform and expanded the client network

Manager and Coordinator, Thayer Gear Sept 2022 – Present

- Managing B2B sales of branded merchandise to the Thayer School community and increased sales 10-fold