

Anh Tran

Resume

Boston, MA | Open to relocation

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Professional Summary

Machine learning engineer and data scientist with expertise in deep learning, statistics, optimization, uncertainty quantification, and computational physics. Over a decade of experience building and deploying end-to-end ML systems across engineering simulation, scientific computing, and intelligent decision-making. Skilled in probabilistic modeling, generative methods, and Bayesian inference, with a strong foundation in numerical optimization and high-performance computing. Proven ability to transform complex, data-rich problems into scalable ML pipelines that bridge research and production. Passionate about advancing science and engineering through AI-driven automation, statistical rigor, and real-world solutions.

Technical Skills

Languages	Python, C++, SQL, Jupyter, Fortran, Bash, R, JavaScript, HTML, MATLAB
Frameworks	LangChain/LangGraph, PyTorch, TensorFlow, Hugging Face Transformers, ReAct, PyTorch Geometric, Scikit-learn, Scikit-image, NumPy, SciPy, OpenCV, JAX
Concepts	Generative AI, LLMs, Agentic AI, Supervised/Unsupervised DL, Reinforcement Learning, Bayesian ML, Active Learning, Gaussian Process / Bayesian Optimization, Bagging/Boosting Ensemble Learning, Graph Neural Network, Neural Operators, Reduced-Order Models, Inverse Problems, Bayesian Optimal Experimental Design, Data Visualization
Workflow	Linux, Docker, Azure/AWS Cloud, Azure Kubernetes Service (AKS), Databricks/Azure ML, Kubeflow/MLflow, MongoDB/Azure MongoDB, VS Code, GitHub/Copilot, SLURM, HPC
Applications	Scientific Computing, Simulation Modeling, Engineering Design, Sequential Decision-Making, Scientific Discovery, Inverse Problems, Parametric PDEs, CFD, FEM, ICME

Applied Expertise

Computer	LLM, Generative AI, Deep Learning, Bayesian Machine Learning, High-Performance Computing
Mathematics	Applied Mathematics, Optimization, Numerical Methods, PDE, Uncertainty Quantification
Statistics	Bayesian Inference, Sensitivity Analysis, Probabilistic Modeling, Stochastic Processes
Engineering	Mechanical Engineering, Computational Mechanics, Materials Science

Professional Experience

- Sep 2025 – Present **Data Scientist, John Hancock / Manulife, Boston, MA**
- Designed and implemented an agentic AI framework for logical reasoning over complex tabular datasets and large document corpora (thousands of pages) using LLMs.
 - Built and deployed end-to-end machine learning pipelines to support life insurance underwriting decisions.
 - Delivered two production systems that automated insurance quote processing, generating an estimated annual cost savings of \$10M.

- Sep 2020 – **Sr. Member of Technical Staff, Computer Science**, *Sandia National Laboratories*, Albuquerque, NM
 July 2025
- Developed and deployed end-to-end machine learning pipelines – including deep learning and generative models – for data-driven prediction and surrogate modeling of parametric PDE systems.
 - Led cross-functional projects integrating scientific ML, statistical modeling, and experimental data to support simulation-based engineering design and decision-making.
 - Contributed to core modules in the DAKOTA software suite (C++/Python), improving scalable optimization, model calibration, and uncertainty quantification features for engineering workflows.
- Jan 2019 – **Postdoctoral Researcher**, *Sandia National Laboratories*, Albuquerque, NM
 Sep 2020
- Designed and implemented scalable optimization and uncertainty quantification methods to support data-driven modeling and simulation workflows in engineering applications.
 - Collaborated with applied mathematics teams to integrate probabilistic inference and adaptive sampling strategies into existing scientific software. Mentored by Dr. Tim Wildey.
- Sep 2014 – **Graduate Research Assistant**, *Georgia Institute of Technology*, Atlanta, GA
 Dec 2018
- Developed machine learning, optimization, and uncertainty quantification tools for multiscale material modeling.
- May 2013 – **Technical Consultant / Research Intern**, *GIW Industries*, Grovetown, GA
 Dec 2019
- Developed large-scale ML pipelines for CFD-driven wear modeling and prediction.
 - Performed sensitivity analysis and optimization, and automated in-house simulation workflows for high-throughput engineering studies.
 - Supported engineers with predictive analytics tools and geometry design automation.

Selected Awards and Honors

- 2025 Panelist for National Academies study “Frontiers of Statistics: 2035 and Beyond” IMSI Uncertainty Quantification for Materials Science Workshop ([link](#))
- 2024 ASME News on CIE/IDETC 2024 Hackathon ([link](#))
- 2021 ASME Journal of Mechanical Design 2021 ASME JMD Reviewer With Distinction Award ([link](#))
- 2010 Finalist Awards (top 1%) in the Mathematical Contest in Modeling (MCM/COMAP) MCM Problem A. Major funding provided by the National Security Agency.
- 2010 6th place in US National Collegiate Mathematics Championship Pittsburgh, PA.
- 2009–2010 Recipient of Gulfstream Aerospace scholarship.
- 2005 Bronze Awards in Singapore Mathematical Olympiads (Senior Section).

Selected Publications

- Hoffman, Diniz, Liu, Rodgers, Tran, and Fuge, “GrainPaint: A multi-scale diffusion-based generative model for microstructure reconstruction of large-scale objects”
 - Nemani, Biggio, Huan, Z. Hu, Fink, Tran, Wang, Zhang, and C. Hu, “Uncertainty quantification in machine learning for engineering design and health prognostics: A tutorial”
 - Tran, Eldred, Wildey, McCann, Sun, and Visintainer, “aphBO-2GP-3B: a budgeted asynchronous parallel multi-acquisition functions for constrained Bayesian optimization on high-performing computing architecture”
- Full publication list available on [Google Scholar](#).

Education

- 2026 – 2028 **(Expected) M.S. in Computer Science**, *Georgia Institute of Technology*
- 2014 – 2018 **Ph.D. in Mechanical Engineering**, *Georgia Institute of Technology*
 Focus: Machine learning, Optimization, Uncertainty quantification, Computational mechanics
- 2014 – 2018 **M.S. in Mechanical Engineering**, *Georgia Institute of Technology*
- 2012 – 2014 **M.S. in Mathematics**, *Georgia Southern University*
- 2008 – 2011 **B.S. in Mechanical Engineering**, *Georgia Institute of Technology*