

Nathan Tsao

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Seeking Full-Time Software Engineer (ML/AI) position, MS'25 UT Austin, currently working on [Murcanti](#).
Project portfolio available at nathantsao.com.

EDUCATION

University of Texas at Austin <i>Masters of Science:</i> Mechanical Engineering (ML-focused) <i>Thesis:</i> Neural Port-Hamiltonian Differential Algebraic Equations	Aug 2023 – May 2025 GPA: 3.74
University of Illinois Urbana-Champaign <i>Bachelors of Science:</i> Mechanical Engineering	Aug 2019 – May 2022 GPA: 3.87

WORK EXPERIENCE

Murcanti Founder	May 2025 murcanti.com
- Leading full-stack development for an e-commerce website (Next.js, Flutter, Supabase, SQL). - Deployed an LLM-powered agentic AI chatbot (AWS Bedrock, FastAPI) to intelligently recommend products (RAG) and facilitate checkout (Stripe). - Deployed custom RESTful API services (TypeScript, FastAPI, Render) for product search and transactions.	
NASA Ames Research Center Autonomous Aircraft Operations Research Intern	June 2025 – Aug 2025 Mountain View, CA
Developed a multi-agent path-planning framework for autonomous aircraft using reinforcement learning (Ray RLlib) to minimize average travel times.	
Berkeley Lights Hardware Engineering Intern	June 2022 – Sep 2022 Berkeley, CA
Automated data-acquisition and calibration pipelines in Python for temperature calibration of OptoSelect chip.	

RESEARCH EXPERIENCE

Autonomous Systems Group: UT Austin Graduate Research Assistant	Dec 2023 – May 2025 Austin, TX
- Designed and implemented compositional machine learning frameworks for differential-algebraic systems in JAX, enabling scalable modeling of electrical networks with >10x accuracy over baselines. - Developed a low-power human activity recognition model optimized for batteryless sensors using PyTorch, resulting in 15-50% relative improvement over baselines.	
Hybrid Robotics Group: UC Berkeley Visiting Research Assistant	May 2022 – Jan 2023 Berkeley, CA
- Implemented a reinforcement learning locomotion balancing controller for tailed quadruped robots using PyTorch and IsaacGym. - Developed 3D printed robotic actuators with custom motor controllers written in C++.	
RoboDesign Lab: UIUC Undergraduate Research Assistant	Jan 2022 – May 2022 Urbana, IL
- Designed a <\$50 USD force-sensing humanoid robot foot prototype with Hall sensors using LabVIEW. - Estimated humanoid robot foot force signals using Gaussian processes with scikit-learn.	

PUBLICATIONS

Cyrus Neary*, Nathan Tsao*, and Ufuk Topcu. Neural Port-Hamiltonian Differential Algebraic Equations for Compositional Learning of Electrical Networks. *Accepted to CDC 2025*.

Geffen Cooper*, Nathan Tsao*, Filippos Fotiadis, Ufuk Topcu, Radu Marculescu. Learning from Sparse and Asynchronous Data Streams for Batteryless Sensors. *Preprint*.

SELECTED PROJECTS

Causal Diffusion Guidance

May 2025

Statistical Machine Learning Final Project

- Developed a diffusion-based training framework for generating causally consistent counterfactuals images.
- Trained diffusion models over multiple GPUs using PyTorch Distributed Data Parallel (DDP).

TEACHING EXPERIENCE

ASE 370C Feedback Control Systems: UT Austin

Jan 2025 – May 2025

Graduate Teaching Assistant

Austin, TX

ME 314D Dynamics: UT Austin

Sep 2023 – Dec 2023

Graduate Teaching Assistant

Austin, TX

SKILLS

ML/AI: PyTorch | Linux | JAX | Flax | Hugging Face | FastAPI | Pandas | Ray (RLlib) | Stable-Baselines3

Programming Languages: Python | TypeScript | SQL | C++

Tooling: Git | Docker | AWS

Languages: English | Mandarin

Other Frameworks: Next.js | Flutter | Supabase