Minh Nguyen CV

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Research Objective

I am a second-year M.S. student in the Berkeley EECS department, working at the intersection of computer architecture and robotics. My research focuses on developing and applying efficient algorithms, custom computer architecture, and machine learning methods to enable the safe, reliable, and scalable operation of complex robotic workloads.

Education

University of California, Berkeley — Berkeley, CA
EECS M.S. GPA: 3.9 — Expected Graduation: May 2026

University of California, Berkeley — Berkeley, CA
Computer Science B.S. GPA: 3.9 — August 2020 – May 2024

Publications

Nguyen, M., Suntup, et al. "Trajectory Optimization Methods for Energy Efficient Gait Transitions on Multi-Modal Robots", IEEE Aerospace Conference, 2024.

W. Chen, **M. Nguyen**, et al. “Decentralized Navigation of a Cable-Towed Load using Quadrupedal Robot Team via MARL”, arXiv:2503.18221, 2025.

V. Lee, **M. Nguyen**, et al. “Chip Placement with Diffusion Models”, ICML, 2025.

S. K. Dong, D. Nikiforov, W. Soedarmadji, **M. Nguyen,** V. Jain, C. W. Fletcher, and Y. Sophia Shao, “Characterizing and Optimizing Real-Time Optimal Control for Embedded SOCs,” IISWC, 2025.

Experience

SLICE Lab — Berkeley, CA
Graduate Researcher — September 2023 – Present

- Accelerating robotic control algorithms with hardware-software co-optimization
  - Hardware implementation with pre-silicon and post-silicon evaluation of Linear Quadratic Regulator and Model Predictive Control algorithm accelerators
  - Architectural changes to the Berkeley systolic array generator for increased utilization in domain specific workloads
  - Using High Level Synthesis to transform robotics C++ code to FPGA & ASIC high performance implementations
- Utilizing Machine Learning and Diffusion Models to perform fast and performant VLSI macro placement
- Developing decentralized and safe robotic systems using reinforcement learning and game theoretic techniques
  - Exploring how to guarantee the safety of a shared object in cooperative robotic tasks with minimal communication

NASA Jet Propulsion Laboratory Pasadena, CA
Robotics Intern January 2023 – August 2023

- Research and development of an active suspension lunar rover
    - Designed and built two power distribution boards for power management
    - Setup simulation pipeline to test control algorithms
- Designed and implemented trajectory optimization algorithms in C++ using nonlinear optimization solvers
    - Ran experiments to validate algorithms in the JPL Mini Mars Yard

Hybrid Robotics Lab Berkeley, CA
Graduate Researcher August 2022 – Present

- Developed Multi-Agent Reinforcement Learning (MARL) algorithms to enable quadruped robot cooperation in cooperative tasks
    - Applied MARL to teach a team of quadrupeds to tow a box around obstacles
    - Utilized scalable algorithms and ran experiments with real robots in a motion tracking room

Wainamics Berkeley, CA
Engineering Intern May 2022 – August 2022

- Research and development of microfluidic systems
    - Designing flow cells and testing different methods of controlling fluid flow
- Development of a general-purpose microfluidic device controller
    - Assembling and reworking PCB boards and components
    - Tuning Peltier machine with closed loop control for temperature-dependent reactions

Space Enterprise at Berkeley Berkeley, CA
Lead Firmware Developer August 2021 – January 2023

- Leader of the software and integration of an amateur rocket team's avionics system
- Developed a motor-powered pressure regulating engine system with closed loop control for greater thrust output
    - Programmed system in C++, designed electronics, modeled system, and tuned PID controllers to maximize propellant flow rate

Teaching Experience

EECS151, Introduction to Digital Design and Integrated Circuits Berkeley, CA
Graduate Student Instructor August 2024 – Present

- Head TA for ASIC lab content which teaches students Verilog and basic VLSI tools for chip design.

Skills

Robotics and Algorithms

- 10+ years of experience in C, C++, Java, and Python
- ROS, Robotic Control, Digital Signal Processing, Multi-Agent Systems, Machine Learning, Reinforcement Learning, and Game Theory

Hardware and Computer Architecture

- ASIC Design, VLSI, FPGA Design, PCB Design, PCB Fabrication, High Level Synthesis, Hardware Acceleration, and Power Distribution Systems