Minh Nguyen Curriculum Vitae

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Research Objective

I am a prospective PhD student interested in computationally efficient robotic control. Seeking to utilize efficient algorithms, custom computer architecture, and machine learning techniques to enable energy-efficient and safe locomotion on dexterous robotic platforms.

Education

University of California, Berkeley — Berkeley, CA
Major: Computer Science. GPA: 3.88 — Expected Graduation: May 2024

Publications

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

Experience

SLICE Lab — Berkeley, CA
Undergraduate Researcher — September 2023 – Present
- Research into developing custom computer architecture for robotic control algorithms
  - Software parallelization of Linear Quadratic Regulator controller using parallel algorithms
  - Hardware-software co-optimization of Nonlinear Model Predictive Control controller on quadrupeds using a hardware matrix multiplier and caching techniques

NASA Jet Propulsion Laboratory — Pasadena, CA
Robotics Intern — January 2023 – August 2023
- Research and development of a novel, articulated suspension lunar rover
  - Designed and built two power distribution PCBs for power management
  - Wrote ROS simulation environments to assess locomotion capabilities
- First author of research into energetically optimal gait transitions for multi-modal robots
  - Designed and implemented trajectory optimization algorithms in C++
  - Setup and ran experiments with motion capture cameras in Mars analogue environment for a 70% reduction in trajectory deviation

Hybrid Robotics Lab — Berkeley, CA
Undergraduate Researcher — August 2022 – Present
- Research into developing reinforcement learning policies for cooperative, multi-agent quadruped systems
  - Translated prior simulation work to real world codebase for Unitree A1 and Go1 quadrupedal robots
  - Implemented localization and reinforcement learning pipeline
  - Ran experiments on quadrapeds to evaluate policies

Wainamics — Berkeley, CA
Engineering Intern — May 2022 – August 2022
- Research and development of microfluidic systems

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

Space Enterprise at Berkeley   Berkeley, CA
Lead Firmware Developer   August 2021 – January 2023
*   Responsible for the software of rockets' avionics systems
      o   Redesigned existing firmware in C++ to be more reliable, readable, and modular
*   Developed a motor-powered pressure regulating engine system with closed loop control and a feedforward model for greater thrust output
      o   Programmed system in C++, designed electronics, modeled system, and tuned PID controllers for propellant flow rate

California Department of Motor Vehicles   Sacramento, CA
Student Intern   August 2020 – August 2021
*   Worked in the Enterprise Application Server Support team at DMV headquarters to maintain and provide support for the DMV queuing system across all locations
      o   Monitored multiple servers and provided assistance for staff remotely accessing their systems

Teaching Experience

CS61C, Great Ideas in Computer Architecture   Berkeley, CA
Teaching Assistant   January 2022 – May 2022
*   Ran 30 student lab sessions, created course content, and led review sessions for 100+ students

Computer Science Mentors   Berkeley, CA
Tutor   August 2021 – December 2021
*   Tutored a group of 6 students over a semester of CS61A, Structure and Interpretation of Computer Programs
      o   Reviewed content through lectures and went through worksheets every week

Awards
*   Winner of Fall 2022 EECS151 FPGA Design Award

Skills
8+ years of experience in C, C++, Java, and Python
Extensive Experience in:
*   ROS, Robotic Control, Digital Signal Processing, Multi-Agent Systems, and Reinforcement Learning
*   FPGA Design, PCB Design, PCB Fabrication, Hardware Acceleration, and Power Distribution Systems