Sidney Nimako

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EDUCATION

Carnegie Mellon University

Master of Science in Robotics (3.9/4.0) May 2025

Selected Coursework: Advanced Mechatronic Design, Mechanics of Manipulation, Introduction to Machine Learning

Bachelor of Science in Mechanical Engineering (3.52/4.0) May 2023

minor in Robotics

Selected Coursework: Robot Kinematics and Dynamics, Human-Robot Interaction, Robotic Systems Engineering, Modern Control Theory

RESEARCH AND PROFESSIONAL EXPERIENCE

Graduate Researcher | CMU Zoom Lab & SHRED Lab | Fall 2023 - Ongoing | Pittsburgh, PA

- Developed and fabricated low-cost, centimeter-scale robots optimized for search-and-rescue operations
- Mentored undergraduate researchers in mechanical design principles and experimental methodologies.

Graduate Teaching Assistant | Carnegie Mellon University | Spring 2024 | Pittsburgh, PA

- Facilitated hands-on research group focused on developing simulations for lunar locomotion using advanced dynamics modeling
- Wrote C++ simulation environments collecting 100+ hours of data

Hardware Engineering Intern | DoorDash Labs | Summers 2022, 2023 | San Francisco, CA

- Led design and fabrication for electrical system for a 4-quadrant dynamometer using a BLDC motor and customized controller firmware
- Designed an intuitive GUI for dynamometer interfacing, enabling seamless operation by non-expert users - Developed controllers to simulate test and road conditions

Undergraduate Teaching Assistant | Carnegie Mellon University | Spring 2023 | Pittsburgh, PA

- Delivered course content on Dynamics Systems and Controls to 90+ students
- Conducted office hours to provide content and programming assistance

Undergraduate Researcher | CMU Robomechanics Lab | Fall & Spring 2023 | Pittsburgh, PA

- Characterized inertial and geometric impacts of active spines on quadrupedal robots
- Created simulation environments for assessing robot performance in Gazebo

Robotics Intern | Facebook AI Research & CMU Robotics Institute | Summer 2021 | Pittsburgh, PA (Remote)

- Redesigned multi-digit robotic hand to reduce envelope by 20%, enhance range of motion, and streamline assembly processes
- Wrote documentation on assembly process and for existing hand design
- Created a specialized rig to characterize consistency and robustness for soft, capacitive sensors, collecting data over 1000+ interactions

PUBLICATIONS

Boateng, S. N., et al. (2024). Heterogeneous Collaboration: A new approach for search-and-rescue operations. In Proceedings of the IEEE International Symposium on Safety Security Rescue Robotics (SSRR).

PROJECTS Additional Projects available at http://snibo.me

Phlebot | Mechatronic Design | Spring 2023

- Designed and prototyped an autonomous venipuncture robot
- Led electromechanical system integration and co-led mechanism design

Hasselhoff Lander | Advanced Mechatronic Design | Spring 2024

- Prototyped an unmanned submersible vehicle for distribution of underwater sensing payloads
- Implemented state management for vehicle operations and SPI communication

Mapping and Payload Robot (MAPR) | Robotics Capstone | Spring 2023

- Built an autonomous indoor delivery robot using ROS1 and off the shelf components
- Led development of mobility subsystem in software and hardware

Toss Juggling In-Sim (and on Hardware) | Mechanics of Manipulation | Fall 2023

- Engineered a DDPG policy to juggle in a custom MuJoCo environment
- Co-designed a compatible hardware platform to embody the policy

Learning Safe Manipulation with Contact | Algorithms for Interactive Robotics | Fall 2023

- Implemented DDQN in custom MuJoCo environments to implicitly learn the safety set and task policies

Macropad Keyboard | Independent | Summer 2021

- Created hardware (mechanical and PCB) and firmware for a 7-key mechanical keyboard with a built-in rotary encoder

SKILLS

Programming: Python, C, C++, MATLAB, Rust
Software: SolidWorks, OnShape, KiCAD, ROS, Linux
Prototyping: 3D Printing, Mill, Lathe, Soldering, Laser Cutting, Circuit Design, PCB(A)

ACTIVITIES & HONORS

Dean's List | Spring 2022, Fall 2022, Spring 2023
University Honors (2023) *from Carnegie Mellon University*
Departmental Honors (2023) *from Department of Mechanical Engineering*
Outstanding Citizenship Award (2019) *from The National Society of the Sons of The American Revolution*

OUTREACH AND MENTORSHIP

Instructor & Web Developer | SHRED Lab | Spring 2025 - Ongoing

- Instructing local community members on STEM skills including web development, soldering and electronics
- Developing backend infrastructure to host data from distributed air quality sensors

RISS & SURF Research Mentor | Carnegie Mellon University | Summer 2024 - Ongoing

- Mentored exchange student from University of Pittsburgh under the Robotics Institute Summer Scholars Program
- Directed research activities for undergraduate students towards data collection, design and prototyping
- Provided feedback and guidance on experimental design, technical writing, and presentation skills