Brooke Chalmers

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Availability: May–December 2023

Education

Khoury College of Computer Sciences, Northeastern University, Boston, MA — September 2021–Present
Candidate for Bachelor of Science in Computer Science — expected graduation May 2025
GPA: 3.89/4.00, Honors Program, Dean's List all semesters
Relevant coursework: *Fundamentals of CS I & II (accelerated), Object-Oriented Design, Algorithms and Data*

Scarborough High School, Scarborough, ME — September 2019–May 2021
Maine School of Science and Mathematics, Limestone, ME — September 2017–May 2019
National Merit Scholar, Maine All-Star Math Team in 2018 and 2019 seasons

Skills

Languages: Python, Rust, JavaScript (client and server), TypeScript, CSS, Java, C++, SQL, MOS 6502 Assembly
Tools: Git, Linux, React, Tailwind, Redis, ROS, Docker, Bash and Zsh, VS Code, Eclipse, IntelliJ

Work Experience

Khoury College of Computer Sciences, Teaching Assistant, Boston, MA — Sept 2022–Dec 2022
- Provided one-on-one assistance to students in an accelerated fundamentals of computer science course.
- Conducted labs, planned assignments, and graded submissions for 70 students as part of a small team.
- Implemented and deployed infrastructure in Rust used for demonstrating student submissions.
- Modernized and adapted existing course material from previous semesters.

Texas Instruments Inc., Manufacturing Specialist Operator, South Portland, ME — June 2021–August 2021
- Operated 20 semiconductor photolithography machines in a cleanroom environment.
- Scheduled and batched work, monitored equipment for malfunctions, and performed basic maintenance.
- Proposed an optimization to workflow involving automated materials stocking which was enacted site-wide.

Extracurricular Involvement

Northeastern University Mars Rover Team, Software Team Co-Lead — Fall 2021–Current
- Led development of an entirely new base station control interface leveraging React and TypeScript.
- Communicated with electrical, firmware, and software teams to integrate various control parameters into the UI.
- Conducted onboarding lectures and wrote reference materials for new members covering React, ROS, Git, etc.

Red Storm Robotics at Scarborough High School, Team Captain — Fall 2019–Spring 2021
- Founded a new VEX Robotics team, recruited members, and organized meetings.
- Trained teammates on basic embedded programming with C++, use of Git, and proper software documentation.
- Contributed 300+ lines of code to the popular Okapilib robotics library.

Personal Projects

Modular Retro Emulation Framework for Desktop and Web — Fall 2022
- Developed a project in Rust for emulating the Commodore 64, VIC-20, PET, and other 6502-based machines.
- Organized a small team to build out support for additional systems and peripherals.
- Implemented both GPU-accelerated desktop support and WebAssembly support for web deployment.

LiDAR-based Expressive MIDI Controller — Spring 2022
- Designed a musical instrument incorporating a LiDAR sensor to detect the position of the user's hands in free space.
- Executed a rule-based strategy in Python to process point cloud data and control a digital audio workstation.

Addressable LED Choker and Companion Android App — Fall 2021–Spring 2022
- Built several necklaces using addressable WS2812B LED strips and various ARM microprocessors.
- Devised a resilient serial protocol for selecting an animation and providing parameters.
- Developed an app with React Native allowing the user to send animation commands over USB or Bluetooth.

Computer Vision Based Local Positioning System for Robotics — Summer 2020
- Designed a system for detecting the position of objects within a camera scene using custom computer vision markers.
- Utilized contour finding, the Douglas-Peucker polygon finding algorithm, and projective transformation matrices.