Sean O'Connor

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Computer Science and Engineering student with extensive experience in software development, robotics research, and technical leadership. Demonstrated track record of building scalable solutions and leading cross-functional teams. Published researcher in human-robot interaction with experience in both academic and commercial software development.

Education

Bucknell University — **Lewisburg, PA**
Bachelor of Science in Computer Science and Engineering — **Expected Graduation: May 2026**

- Cumulative Engineering GPA: 3.90. Dean's List: Fall 2022, Fall 2023, Spring 2024

Experience

Riverhead Raceway — **Riverhead, NY**
Software Developer — **Oct 2020 – Present**

- Engineered a digital registration platform that modernized paper-based processes, integrating payment processing and real-time number availability checking, eliminating manual processing delays
- Built and deployed a high-performance race statistics platform serving 1500+ concurrent users, providing real-time access to driver positions, rankings, and lineups, replacing physical bulletin boards
- Developed an intuitive content management system tailored for non-technical staff, enabling content management through familiar interfaces while maintaining website consistency
- Orchestrated migration to containerized architecture using Docker and implemented automated backup systems to improve reliability

IT Administrator — **Oct 2020 - Apr 2024**

- Engineered migration from consumer desktop computers to enterprise thin clients with virtualization servers, improving reliability and remote access capabilities enabling continued support while away at university
- Implemented automated backup solutions using the Backblaze platform with version control and disaster recovery procedures
- Deployed Windows Server with Active Directory for centralized user management and file storage
- Established standardized workstation images and software deployment protocols across facilities

Media Producer — **Oct 2020 - Apr 2024**

- Designed and deployed facility's first multi-camera live streaming system with ATEM production switchers and custom graphics pipeline
- Developed real-time graphics integration system connecting race timing data to broadcast overlays
- Operated replay and instant highlight system for live broadcast to FloRacing and NBC Sports networks
- Managed live production during race events, coordinating camera operators, replay, and graphics control

Bucknell University — **Lewisburg, PA**
Computer Science Researcher - Human-Robot Interaction — **Jan 2023 – Present**

- Engineered a modular web-based experimental platform for human-robot interaction studies using the Wizard of Oz experimental paradigm and ROS2 and C++/Python
- Published and presented a first-author paper and poster at the 33rd IEEE International Conference on Robot and Human Interactive Communication

Computer Science Research Assistant - Chemical Engineering Department — **Aug 2023 – Present**

- Designed and implemented an automated data collection system using a microcontroller and C++ to collect real-time temperature, pressure, and humidity data in harsh environments
- Currently integrating robotic arm into existing coffee research project to automate repeated brewing-related tasks and data collection, freeing up researchers from unskilled repetitive work

Computer Science Teaching Assistant — **Jan 2024 - Present**

- Led lecture and lab sections focusing on agile development practices and following scrum guidelines for group work in the field of computer science.
- Assisted students with classwork, homework, and lab assignments, focusing on teaching students how to find the answers to their questions using existing documentation

Engineering Study Spot Tutor - Computer Science — **Aug 2024 - Present**

- Held drop-in help sessions for computer science students throughout all stages of the curriculum, assisting with introductory courses, software engineering, and systems programming assignments

Engineering Teaching Assistant **Aug 2023 - Dec 2023**

- Led recurring workshops on Arduino-based microcontroller programming, assembly, and wiring for multidisciplinary student engineering projects
- Assisted students during class and lab sections on their design session projects, with emphasis on engineering ethics education

Physics Teaching Assistant **Aug 2023 - May 2024**

- Assisted students during laboratory sections with introductory and exploratory physics lab experiments, working with industry-standard data collection and analysis tools

Miller Place School District **Miller Place, NY**
Information Technology Intern **Sep 2020 - May 2022**

- Worked under senior technical staff to assist faculty, staff and students with district-owned printers and computers
- Assisted staff in one-laptop per person deployment and support in response to the COVID-19 pandemic, teaching students how to fully utilize newly-available remote learning tools and programs

Activities

AIChE Chem-E-Car Competition Team **Lewisburg, PA**
President, Electrical and Mechanical Team Lead **Jan 2023 – Present**

- Pioneered team's first custom hardware solution: designed and fabricated a microcontroller-based control system with isolated power circuits for hydrogen fuel cell regulation
- Implemented finite state machine architecture integrating spectrometer readings, relay control, and LED feedback for real-time reaction monitoring in isolated chamber conditions

Bucknell Coffee Society **Lewisburg, PA**
Treasurer **Oct 2023 – Present**

- Co-established and launched a new campus organization, managing financial operations and coordinating event logistics.
- Presented on ongoing research for publication by Bucknell's student story, engineering report, and fall magazine

RoboLab@Bucknell **Lewisburg, PA**
Founding Member **Sep 2023 - Present**

- Led and participated in group discussions in a new lab bridging computer science and psychology perspectives on human-robot interaction, working with the complexities of human-robot trust, job replacement, and autonomy

Conferences and Competitions

IEEE International Conference on Robot and Human Interactive Communication **Aug 2024**

- Presented a first-author paper in a poster session regarding my project HRIStudio, a novel tool enabling human-robot interaction experiments to be conducted by those unfamiliar with robotic platforms and programming

AIChE Annual Student Conference **Oct 2024**

- Competed in the 2024 National AIChE Chem-E-Car Performance Competition with Bucknell's car, H_2Go
- Presented the design of our car in a poster session, heavily focusing on the safety-related aspects of our design

AIChE Mid-Atlantic Regional Conference **Apr 2024**

- Placed second overall in the 2024 Mid-Atlantic AIChE Chem-E-Car Performance Competition with our car, H_2Go
- Presented the design of our car in a poster session, heavily focusing on the safety-related aspects of our design

Specialty Coffee Exposition **Mar 2024**

- Attended as a representative of the Bucknell Coffee Society, meeting with vendors and equipment manufacturers to request sponsorship, donations, and educational materials for our club

AIChE Annual Student Conference **Oct 2023**

- Attended as a representative of Bucknell's Chem-E-Car team, discussing designs and reactions with other teams to kickstart development of the next year's car

AIChE Mid-Atlantic Regional Conference **Apr 2023**

- Competed in the 2023 Mid-Atlantic AIChE Chem-E-Car Performance Competition with our car, H_2Go
- Presented the design of our car in a poster session, heavily focusing on the safety-related aspects of our design

Publications

[1] Sean O'Connor and L. Felipe Perrone. HRIStudio: A Framework for Wizard-of-Oz Experiments in Human-Robot Interaction Studies (Late Breaking Report). In *2024 33rd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN)*, 2024.

Relevant Coursework

Systems & Architecture: Computer Systems, Operating Systems Design, Computer Networks & Security
Software Development: Software Engineering, Data Structures & Algorithms, Research Methods, Ethics in Computing
Mathematics: Calculus II, Linear Algebra, Discrete Mathematics, Statistics, Applied Statistics with R, Data Mining

Skills & Interests

Languages & Frameworks: Java, C/C++, Python, JavaScript/TypeScript, React, Next.js, PHP, SQL
Backend & DevOps: REST APIs, MySQL, PostgreSQL, Docker, Apache Web Server, NGINX, ROS2
Cloud & Infrastructure: AWS, GCP, Azure, Backblaze, Linux (RHEL/Debian), CI/CD
Development Tools: Git, JetBrains Suite, VS Code, Cursor, Linux CLI