

## Chaeson Sears II

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### EDUCATION

Boston University

12/2026

**M.S., Robotics and Autonomous Systems**

Boston, MA

Related coursework: Soft Robotics, Dynamic Systems Theory, Intro to Learning from Data (Machine Learning), Medical Robotics,

California State University, Fresno (Fresno State)

08/2021-05/2025

**B.S., Mechanical Engineering/ Mathematics Minor**

Fresno, CA

Related Coursework: Introduction to Principles of Machine Learning, Dynamic Systems Theory, Soft Robotic Technologies, Engineering Statistics and Experimentation, Product Development, Computer Applications in Mechanical Engineering, Engineering Graphics, Design Machine Elements, Advanced Engineering Analysis, Kinematic Machinery

### SKILLS

- Problem-Solving, Critical Thinking, Quick Learner, Adaptability, Leadership, Teamwork, Effective Communication
- **Devices and Equipment:** Soldering Station, Lathe, Milling Machine, 3D Printer, Arduino, Raspberry Pi
- **Software:** SolidWorks, Fusion360, AutoCAD, Microsoft (Word, Excel, Teams, PowerPoint), C++, MATLAB, Ansys, Python

### PROJECT EXPERIENCE

**Lead Developer, Teleoperated Quadraped "Spyder" Robot**, Boston, MA

10/2025-12/2025

- Independently designed and fabricated a functional quadraped robot using 3D-printed components and 12 MG996R servo motors for 3-DOF per limb mobility.
- Implemented a wireless control system using an **ESP32-S3** microcontroller and Bluetooth Low Energy (BLE), enabling real time teleoperation via a custom coded Remote-xy mobile interface.
- Developed a custom C++ script to execute complex gait patterns, including lateral movement, crouching, and standing, while managing power distribution over a **PCA9685** controller.

**Team Lead, Voice Controlled Prosthetic Hand**, Fresno, CA

08/2024 – 05/2025

- Designed a prosthetic hand with 9 degrees of actuation and a planetary gear system, increasing torque and enabling dexterous movements that mimic human hand functions.
- Programmed the device in **Python** to convert voice commands into actuator control, enhancing usability and accessibility for users.
- Lead this project by implementing frameworks to keep track of project progression (Gantt Chart, HOQ) and resolving team disputes by using quantitative evaluations of design effectiveness.

**Team Associate, Speed Reduction Gear Box**, Fresno, CA

01/2024 – 05/2024

- Designed a speed reduction gear box in **SolidWorks**, accomplishing the expected output of 185 rpm, from an input of 2000 rpm.
- Created code in **MATLAB** to automate calculations for stress on gears, bearings, screws, step shafts and housing.
- Performed **FEA** analysis on individual components using **ANSYS**, to compare the results with our **MATLAB** calculations.

### EXPERIENCE

**Robotics Instructor**, iCode Wellesley, Wellesley, MA

09/2025 – Present

- Deliver hands-on instruction in robotics and programming to K–12 students using modern hardware and software tools.
- Coach two VEX Robotics teams (10 students in total) through mechanical design, programming, and competition strategy.
- Lead robotics and programming workshops for partner schools to support STEM curriculum integration.

**UM Star/Adapt Undergraduate Research Intern**, University of Maryland, College Park, MD

06/2024 – 08/2024

- Tasked with testing the validity of open-source motion capture software, Open-Cap, which claims to analyze the kinematic and dynamic data of an individual in a natural setting.
- Developed an experimental set up to capture the **biomechanics** of able-bodied individuals (REU Peers).
- Fine-tuned Open-Cap's software to compare the results of its motion capture capabilities to standard motion capture equipment such as Vicon hardware and Nexus software.
- Analyzed experimental data using a **Python** script and interpreted the data into a visual chart using **MATLAB**.
- Through this study we determined that Open-Cap is viable for kinematic data collection but not for dynamic data, so Open-Cap software is not yet viable for testing in a natural setting.

**Undergraduate Research Assistant**, Fresno State Nguyen Lab, Fresno, CA

06/2023 – 05/2025

- Conducted research on the development of an affordable prosthetic for trans-radial amputees, utilizing 3d printing technology.
- Developed various prototypes for assembly, using **SolidWorks** design software and Creality slicer software.
- Optimized design aspects such as the system of actuation to increase the prosthetic hands capabilities.
- Integrated a control system for the arm using **EMG Sensors** controlled by a microprocessor (**Raspberry Pi**).
- Many affordable prosthetic hands have 6 degrees of actuation, while my current design allows for 11, increasing the dexterity of the hand by 83%.

### LEADERSHIP EXPERIENCE

**Vice President, National Society of Black Engineers (NSBE)**, Fresno, CA

08/2024 – 05/2025

- Organized resume workshops for our students to be adequately prepared for career development conferences.
- Assisted in developing Fresno States NSBE into a national chapter.
- Handle leadership requirements when the president is unavailable.

**President, (V.P. 5/24 – 05/25) Black Excellence in Science and Technology (B.E.S.T) Club**, Fresno, CA

08/2023 – 05/2024

- Developed outreach events to encourage K-12 students to participate in STEM, both on and off campus.
- Networked with various professionals and organizations to fundraise/ donate over \$7,000 for club engagement and outreach events.
- Established an annual fundraising concert/vendor event allowing local artists and merchants to gain exposure while promoting STEM in the community to families, event raised \$1,500.
- Developed a constitution and managed elections to establish a structure and promote longevity, assuring that the club can continue to introduce young students to STEM.