CHONGYANG RAO

- Santa Barbara, CA | crao4036@gmail.com

EDUCATION

- **University of California, Santa Barbara | Bachelor of Science in Electrical Engineering**
  - **ExpectedGraduationDate:** June2026
  - **GPA:** 3.74
  - **Coursework:** Embedded Systems, CAD Design, Electronics Prototyping, Circuit design, Logic Design, Signal Analysis, Electromagnetism, Quantum Physics, Data Structures and Algorithms, Machine Learning, Deep Learning, Calculus, Linear Algebra.....

PERSONAL EXPERIENCE

BCI Signal Processing Intern — SciTrek Summer Research Program **Apr 2025 – Present**

- Designing EEG preprocessing and feature-extraction pipeline to drive a 3-DOF robotic arm prototype for classroom demos.
- Implemented real-time brain-to-motor mapping in Arduino (C++), achieving <150 ms latency; preparing outreach lesson to let students “move the arm with their thoughts.”

Research Assistant — Human–Computer Interaction (HAX) Lab, UCSB **Mar 2025 – Present**

- Prototyped wearable sensor arrays for facial-gesture interaction (cheek EMG & camera-based landmark tracking).
- Created a Unity demo for hands-free cursor control with a “face-click” gesture—users wink or blink to select.

Research Intern | China Academy of Space Technology (CAST) **Jul 2024 - Oct 2024**

- Built an astronaut-oriented VR operation interface with Manus Gloves and ZED stereo cameras for remote experimental guidance.
- Engineered a multi-device communication framework, achieving precise synchronization between Unity, Manus gloves, and ZED cameras.
- Designed haptic feedback modules, enhancing user interaction and immersion in simulated environments.
- Focus on wearable sensing, spatial computing, and human-in-the-loop system design.

PERSONAL PROJECT

Motion Capture Spatial Interaction Prototype – Bowling Simulation **Jul 2024 - Oct 2024**

- Developed a Unity-based spatial interaction system using Manus Data Gloves and ZED depth camera.
- Built real-time UDP communication for low-latency hand tracking and interactive object control.
- Simulated gesture-based bowling with physics feedback; designed for VR deployment but focused on interaction layer implementation.

Hand-Controlled Robotic Arm on Arduino **Jul 2022 - Oct 2022**

- Built a 5-DOF robotic arm, integrating servo motors & Arduino UNO for precise movement.
- Developed motion memory functionality, enabling the robot to record & replay movements.
- Proposed gesture-based control using MPU6050 gyroscope & Flex sensors, enabling future upgrades.

TECHNICAL SKILLS

- **Languages:** English, Mandarin.
- **Programming :** Python, C++, Matlab
- **Design & Fabrication:** 3D Printing (FDM & SLA), Resin Casting, Sculpture Modeling, Blender, Fusion 360, SolidWorks, Nomad, Shapr3D
- **Electronics:** Circuit Prototyping, Arduino, STM 32, Embedded Systems
- **Instruction & Facilitation:** Workshop Facilitation, Technical Tutorials, User Support