Sergio A. Esteban

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Education

California Institute of Technology **Pasadena, CA**
Ph.D., Mechanical Engineering, Robotics – Controls & Dynamics Expected June 2026
- Advisor: Dr. Aaron D. Ames

California State Polytechnic University, Pomona **Pomona, CA**
B.S., Mechanical Engineering December 2020
- Major GPA: 3.95 / 4.00 | Overall GPA: 3.94 / 4.00
- Summa Cum Laude

Research Interests

I am interested in robotic locomotion and control of hybrid systems. Additionally, I am interested in working at the intersection of control theory and machine learning for robots.

Publications

1. **Esteban, S.**, H. Lopez, N. Tsuchiya, and P. Mannion, "Low-cost open-architecture experimental platform for dynamic systems and feedback control," *American Society for Engineering Education (ASEE), Annual Conference and Exposition*, 2021

2. **Esteban, S.** and P. Lee, "Fog on mars: Potential implications for water extraction from the martian atmosphere," *49th Lunar and Planetary Science Conference*, no. 2770, 2018

Honors and Awards

GEM Fellowship Program September 2021 - June 2026
Ph.D. Engineering Fellow, 5-year sponsorship by MIT Lincoln Laboratory and Caltech.

Stanford University SURF Poster Presentation, 2nd Place August 2019
Award based on poster and oral presentation among 40 other scholars in Stanford's SURF Program.

Dean's and President's List September 2016 - December 2020
Cal Poly Pomona high GPA distinction.

Work Experience

MIT Lincoln Laboratory **Lexington, MA**
Research Intern (GEM Fellow) *June 2021 - August 2021*
- Designed and fabricated a 3D printed gimbal to serve as a testbed for the development of novel control algorithms for low orbit space to ground tracking. I developed a state space control algorithm for initial testing.
- Developed test fixtures and test scripts for servo motors. The idea was to characterize servo motor performance for long-range air to ground tracking.

Raytheon Intelligence & Space **El Segundo, CA**
Mechanical Engineer I *January 2021 - May 2021*
- Designed support and test equipment for space hardware.
- Wrote Python scripts for hardware testing automation and supported thermal-vacuum testing efforts.
- Generated and revised drawings for support and test equipment as well as space hardware.

Stanford University **Stanford, CA**
Research Intern, SURF Program *June 2019 - August 2019*
- Programmed quadcopters to autonomously follow a predetermined set of waypoints for an Antarctica ecological surveying project for the Multi-Robot Systems Laboratory (MSL).
- Tested the waypoint following algorithm I developed by using quadcopter test platforms in an indoor OptiTrack system and in an outdoor park.

- Wrote Python and C++ nodes using Robot Operating System (ROS) 2 to determine the feasibility of moving the drone platform (code) from ROS to ROS 2.

NASA Jet Propulsion Laboratory **Pasadena, CA**

Full-Time Hardware Engineer and Research Engineer *January 2019 - June 2019*

- Mars Perseverance Rover
  - Built the rover mobility system with a team of mobility engineers and flight technicians.
  - Performed static tests on sub-assemblies of the rover mobility system.
  - Supported cleanroom operations involving critical flight hardware assembly in the Spacecraft Assembly Facility.
  - Built fixtures to lift the rover suspension system for all installation operations.
- Multi-limbed Autonomous Robosimian Robot
  - Designed a complete wheel assembly for the Robosimian robot's locomotion research.

California Institute of Technology **Pasadena, CA**

Research Intern, WAVE Fellows Program *June 2018 - August 2018*

- Designed, fabricated, and programmed a complete two-axis gimbal system for the AMBER Lab's Mars Perseverance Rover Scout Helicopter safety-critical control research.

Search for Extraterrestrial Intelligence Institute **Mountain View, CA**

Research Intern, CAMPARE Program *June 2017 - August 2017*

- Worked with a planetary scientist on investigating the feasibility of water extraction from Mars' atmosphere for Mars human exploration in-situ resource utilization (ISRU) purposes.
- Presented a poster and submitted an abstract to the 2018 Lunar and Planetary Science Conference (LPSC) and gave talks at SETI's "Lightning Talks" series and Cal Poly Pomona's CAMPARE Summer Research Symposium.

Teaching Experience

Cal Poly Pomona Educational Opportunity Program (EOP) **Pomona, CA**

Tutor *September 2018 - December 2018*

- Tutored students in college-level math, science, and mechanical engineering courses while attending school full time.

Cal Poly Pomona Educational Talent Search (ETS) **Pomona, CA**

Tutor and Peer Mentor *October 2016 - June 2017*

- Tutored high school mathematics and physical science courses while attending school full time.
- Conversed with students and offered advice regarding academic and professional development.

Cal State San Bernardino Student Mentoring Program (SMP) **San Bernardino, CA**

Student Mentor *September 2015 - June 2016*

- Mentored freshman students that were unfamiliar with the college environment.

Community & Leadership

FIRST Robotics Competitions **Pasadena, CA**

Team Mentor *August 2022 - Present*

- Mentor high school students in building an industrial-size robot to play a field game.

Iglesia de Dios en Riverside **Riverside, CA**

Music Teacher *January 2017 - Present*

- Give music lessons to local community members on music theory and technique for piano, guitar, bass, and drums.

Technical Skills

Programming: C++, Python, MATLAB, Simulink, LabView, Visual Basic (Excel)

Technical Tools: Solidworks, Creo, Siemens NX, Femap Nastran, Robot Operating System (ROS), MSC ADAMS, WordPress

Writing Tools: LaTeX, MathCAD, Microsoft Office

Version Control: cPDM, EPDM, GitHub, Siemens Teamcenter

Embedded Platforms: Arduino, Raspberry Pi, Texas Instruments MCUs

Operating Systems: Linux-based Systems (Ubuntu), Windows, macOS

Machine Prototyping: Vertical Mill, Lathe, Water Jet, Soldering, Welding, 3D Printing, Laser Cutting

Languages: English and Spanish: Fluent (Written/Spoken). Technical interpretation/translation experience.