Jose Guerrero

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U.S. Citizen

LinkedIn: Google Scholar: ORCID: Website:

Education

Department of Aerospace Engineering, University of Michigan Ann Arbor, MI.
Ph.D. in Aerospace Engineering Mar. 2026 *(expected)*
- Advisor: Prof. Mirko Gamba

Department of Mechanical and Aerospace Engineering, UCLA Los Angeles, CA.
B.S. in Aerospace Engineering Mar. 2021
- GPA: 3.94/4.00
- Honors: Summa Cum Laude
- Awards: Outstanding B.S. in Aerospace Engineering 2020-2021

Teaching Experience

University of Michigan, Ann Arbor
Graduate Student Instructor - Compressible Flow Aug. 2022 - Dec. 2022

Hispanic Heritage Foundation
Teaching Fellowship - Intro to Aerospace Engineering Nov. 2022 & Apr. 2024

Research Experience

University of Michigan, Ann Arbor, MI.
Graduate Research Assistant Aug. 2021 - Present
- Developed, validated, and demonstrated a MHz-rate laser absorption spectroscopy sensor to obtain time-resolved measurements of temperature and H_2O partial pressure in a rotating detonation combustor (RDC).
- Introduced two novel methods for measuring combustion efficiency of RDCs using laser absorption spectroscopy and thrust stand measurements respectively.
- Integrated combustion efficiency measurements with a reduced-order model to infer the first integrated heat release fractions associated with an RDC cycle.

Sierra Lobo Inc., Edwards AFB, CA.
Liquid Rocket Propulsion Intern Engineer II Apr. 2021 - Aug. 2021
- Provided an initial assessment of accelerometer data from Space-X's SN10-SN15 Starship flights. The focus was to identify anomalies, and correlate sensor data to video footage. This was also done across test to identify changes.

Sierra Lobo Inc., Edwards AFB, CA.
Liquid Rocket Propulsion Intern Engineer Jun. 20 - Sept. 2020
- High-speed pressure sensors installed in a recessed configuration during AFRL's Hydrocarbon Boost (HCB) technology demonstration program exhibited noise artifacts caused by the acoustic cavity. My work focused on implementing physics-informed filters to predict the cavity response and remove it, enabling accurate assessment of the combustion stability of the test.

University of California Los Angeles, Los Angeles, CA.
Undergraduate Research Assistant Sept. 2018 - Dec. 2019
- Acoustically coupled micro-jet flame combustion was studied in a cylindrical cavity closed on both ends by speakers to form a standing wave, and the dynamics were analyzed using proper orthogonal decomposition (POD).

Skills

Research: Shock waves and detonations, shock tubes, rotating detonation engines/combustors (RDEs/RDCs), combustion diagnostics including combustion efficiency and emissions, tunable diode laser absorption spectroscopy (TDLAS), scanned- wavelength-modulation spectroscopy (Scanned-WMS).

Measurements: Laser absorption spectroscopy, OH^* chemiluminescence imaging, high-speed and CTAP pressure measurements

Process flow control: Mass flowrate and pressure control, oxygen service (CGA G-4.4)

Design: Injector manufacturing using 3D-printing (DMLS), components with o-rings and optical access

Testing: *Fuels*: Mixtures of H_2 and CH_4 with with air, *Diluent*s: CO, N_2

Computer Programming and Software: `MATLAB`, `Python`, `CANTERA`, SolidWorks, LaTeX.

Languages: English, Spanish.

Honors & Awards

Rackham Merit Fellowship

University of Michigan Aug. 2021

- "The Rackham Merit Fellowship is a highly competitive named fellowship awarded to students who have outstanding academic qualifications and show exceptional potential for scholarly success in their graduate program."

Outstanding B.S. Aerospace Engineering Award

University of California, Los Angeles (UCLA) Mar. 2021

- "The Mechanical and Aerospace Engineering Department annually issues the Outstanding BS, MS, and PhD awards to graduating students. The Awards and Honors Committee select the winner based on various criteria; including but not limited to the student's GPA, research activities, publications, extra-curricular activities, etc."

Vishal Parikh Memorial Scholarship

University of California, Los Angeles (UCLA) May. 2020

- This merit-based scholarship of $2,200 is awarded to an undergraduate student with a demonstrated interest in rocket propulsion systems, in honor of Vishal Parikh, a 2009 graduate of the UCLA Aerospace Engineering program. In addition to the scholarship, the recipient participates in a paid summer internship at the Air Force Research Laboratory located at Edwards Air Force Base in California.

Invited Presentations

[1] **Guerrero J. I.**, "The Quest for Positive Pressure Gain" *Fluid Mechanics Research Seminar*, University of Michigan, Ann Arbor, 03.26.2025.

Journal Publications

[1] **Guerrero J. I.**, Gamba M. "Quantifying Combustion Efficiency in Rotating Detonation Engines Using MHz-Rate Scanned-Wavelength-Modulation Spectroscopy" *Combustion and Flame*, 2025. (*accepted*)

[2] **Guerrero J. I.**, Gamba M. "A Review of Theory and Practical Considerations of Tunable Diode Laser Absorption Spectroscopy Diagnostics" *arXiv:2512.18201*, 2025

Conference Proceedings

[1] **Guerrero J. I.**, Gamba M. "Quantifying Deflagration Losses in Rotating Detonation Combustors" *AIAA SciTech Forum*, 2026.

[2] **Guerrero J. I.**, Gamba M. "Combustion Efficiency Measurements in a Rotating Detonation Engine Using Scanned-Wavelength-Modulation Spectroscopy" *AIAA SciTech Forum*, 2025.

[3] **Guerrero J. I.**, Gamba M. "Post-Incident Shock Wave Measurements of Gas Properties at 1 MHz Using Scanned-Wavelength-Modulation Spectroscopy" *AIAA SciTech Forum*, 2025.

[4] **Guerrero J. I.**, Gamba M. "Synthetic LAS Measurements of Combustion Efficiency in a Rotating Detonation Engine Using 3D-DNS Data" *AIAA SciTech Forum*, 2025.

[5] **Guerrero J. I.**, Gamba M. "A Method for Determining Combustion Efficiency from LAS Data and a CTAP Measurement" *International Workshop on Detonation for Propulsion*, 2024.

In Preparation

[1] **Guerrero J. I.**, Gamba M. "Quantifying Deflagration Losses and Their Influence on Pressure Gain In Rotating Detonation Combustors" *AIAA Journal of Propulsion and Power*, 2026.