Gala Cassiel Solis

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Portfolio: astrocassiel.github.io

Education

Carnegie Mellon University, Pittsburgh, PA — Expected Dec 2026
Ph.D. in Mechanical Engineering
M.S. in Mechanical Engineering

The University of Texas at El Paso, El Paso, TX. — August 2017 – December 2021
B.S. in Mechanical Engineering, Minor in Mathematics

Skills

Software: Siemens NX, SolidWorks, Fusion 360, PTC Creo, MATLAB, Python, LabVIEW, Autodesk Netfabb, Materialise Magics, Ansys Thermal, FLOW-3D
Hardware: Additive Manufacturing (WAAM, LPBF, Powder-DED, FDM), Metallography (Polishing/Etching), Mechanical testing, Machine shop tools and safety, GMA Welding, Optical Microscopy

Relevant Experience

Carnegie Mellon University, Graduate Research Assistant (EMIT and Malen Lab)
Pittsburgh, PA | August 2022 – Present

- Utilized a **two-color imaging technique** with a single camera to capture accurate real-time melt pool temperatures by **eliminating the need for emissivity**, enhancing process monitoring and defect detection in welding-based processes.
- Conducted detailed experiments with low-carbon steel, adjusting critical welding parameters such as Wire Feed Speed (WFS) and Travel Speed (TS) and calculated cooling rates for model validation.
- Performed image processing and data analysis using MATLAB to filter arc-period frames that cause over saturation, LabVIEW, Python, and extended these capabilities to Julia for developing closed-loop control systems in WAAM processes.

NASA Marshall Space Flight Center, Summer Graduate Intern
Huntsville, AL | June 2025 – August 2025

- Technology transfer of thesis work, applying two-color thermography for melt pool monitoring on CMT WAAM
- Supported process monitoring for other DED processes using Regolith

The Aerospace Corporation, GEM Fellow Graduate Intern
El Segundo, CA | June 2022 – August 2022

- Captured in-situ temperature data from two-wavelength pyrometers on powder-fed DED of Inconel 625 samples, varying geometries to analyze the impact of melt pool behavior on porosity and Vickers hardness.
- Conducted comprehensive metallography including polishing, etching, and quenching heat treatments.
- Evaluated primary and secondary dendrite arm spacing with a Keyence optical microscope to correlate microstructure with thermal data.

Launcher Space, Inc., Additive Manufacturing Intern
Hawthorne, CA | June 2021 – August 2021

- Managed the operations and maintenance of the VELO 3D laser powder bed fusion (LPBF) machine, including calibrations, filter replacements, and loading of Inconel 718 powder, while also procuring all necessary safety equipment to ensure compliance and safe operation.
- Iterated on a gimbal design mockup made of PLA for the Orbiter engine support, capable of holding up to 90 cube satellites for deployment via SpaceX's Falcon 9 and Launcher's Launcher Light rocket.
- Designed region channels of the Orbiter engine using SolidWorks, applying heat transfer calculations to optimize internal wall profile points for improved thermal management and structural integrity.

KCNSC Honeywell FM&T, AM Process Engineering Intern
Kansas City, MO | June 2020 – August 2020

- Designed fastening tools for clean room use using SolidWorks and managed the parts through the entire additive manufacturing process, including build preparation with Materialise Magics and parameter setup on Renishaw AM250 and Mlab LPBF machines.
- Conducted profilometry tests before and after vibratory deburr post-processing to evaluate changes in surface roughness and assess tolerances against nominal design dimensions.
- Contributed to drafting and editing a handbook detailing machinability processes for additive manufacturing, enhancing procedural knowledge and safety guidelines within the department.

Other Experience

The University of Texas at El Paso, Undergraduate Research Assistant (W. M. Keck Center)
El Paso, TX | August 2019 – December 2021

- Fabricated thermally actuated liquid crystal elastomers for soft robotics applications using direct-write (DIW) additive manufacturing.
- Optimized processing parameters of Fused Deposition Modeling (FDM) plastic-bonded metal filament (Inconel 718 and Copper), which yield 100% metal after sintering and post-processing.

Massachusetts Institute of Technology Lincoln Laboratory, Student Technical Assistant
Lexington, MA | January 2022 – May 2022

- Supported the development of deployment mechanisms for Cube Satellites under extreme temperature variations.
- Designed and tested equipment using SolidWorks and collaborated with engineering teams for design optimization.

NASA Marshall Space Flight Center, Polymer Engineering Intern
Huntsville, AL | January 2019 – May 2019

- Characterized thermal behavior of ionic polyimides for in-space additive manufacturing using DSC, TGA, and TMA.

NASA Glenn Research Center, Propulsion Intern
Cleveland, OH | June 2019 – August 2019

- Analyzed thermal performance of propulsion systems, enhancing safety protocols for manned space missions.
- Prepared detailed reports on system components' reliability and operational readiness.

NASA Marshall Space Flight Center, Mechanical Design Intern
Huntsville, AL | January 2019 – May 2019

- Designed components for reaction control systems using Siemens NX.
- Performed high-pressure tests on prototype valves to ensure durability and safety.

Publications & Conference Talks

- G. Solis et al., *"Two-Color Thermography of Welding to Enable Real-Time Hardness Prediction,"* Welding Journal Research Supplement, accepted for publication.
- Solis, G. (2024). "*Melt Pool Thermal Imaging on Wire-Arc Additive Manufacturing Using the Two-Color Method with a Commercial Color Camera."* Materials Science & Technology (MS&T24), October 7, Pittsburgh, PA.
- Solis, G. (2023). "*Thermal Imaging for Wire Arc Additive Manufacturing Using an Off-the-shelf Color Camera."* Annual International Solid Freeform Fabrication Symposium (SFF Symp 2023), August 15, Austin, TX.
- O'Harra, K.E., Noll, D.M., Kammakakam, I., DeVriese, E.M., Solis, G., Jackson, E.M., Bara, J.E. (2020). "*Designing Imidazolium Poly(amide-amide) and Poly(amide-imide) Ionenes."* Polymers, 12(6):1254.

Community Engagement

- **Social Committee Chair**, Mechanical Engineering Graduate Student Organization, CMU (Fall 2023 – Spring 2025)
- **Teaching Assistant**, Additive Manufacturing Laboratory, Carnegie Mellon University (Spring 2025)
- **Volunteer**, Gelfand STEM Outreach Center for K-5, Carnegie Mellon University (Fall 2022)
- **Engineering Mentor**, College preparation for high school students in marginalized communities, El Paso Leadership Network (2021-23)
- **College Mentor**, Girls Inspired & Ready to Lead (GIRL), The Aerospace Corporation (Summer 2022)