MICHAEL LAWRENCE GARCIA

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OBJECTIVE

I am seeking research roles utilizing my experience in deep learning, high performance computing, computational fluid dynamics, and propulsion engineering which advance the cutting edge in engineering and science.

EDUCATION

Columbia University in the City of New York September 2020 - May 2025
M.S. in Mechanical Engineering
B.S. in Mechanical Engineering, Minor in Computer Science

PROFESSIONAL EXPERIENCE

Columbia University in the City of New York July 2024 - Present
Graduate Researcher *New York, NY*

- Member of Vijay Vedula's cardiovascular biomechanics research laboratory researching continuum mechanics.
- Refactored a large lumped paramter network of the human circulatory system in Julia and parallelized it in CUDA.
- Applied Bayesian neural networks to predict lumped parameters from small-scale patient datasets.

California Institute of Technology May 2023 - February 2024
Visiting Undergraduate Researcher *Pasadena, CA*

- Member of Professor H. Jane Bae's turbulence research group in the Graduate Aerospace Laboratories (GALCIT).
- Independently procured $11,500 USD to perform numerically consistent deep learning of LES SGS models.
- Presented novel research in a talk at the American Physical Society Division of Fluid Dynamics.

Columbia University in the City of New York September 2021 - January 2023
Undergraduate Researcher *New York, NY*

- Member of Columbia's Environmental Flow Physics Laboratory, a computational fluid dynamics lab.
- Developed a Lagrangian particle transport solver using large eddy simulation in Fortran and Python postprocessor.
- Received a $5,000 USD Bonomi scholarship in recognition for my work in turbulence research.

California State University, Long Beach June 2021 - January 2022
Visiting Undergraduate Researcher *Long Beach, CA*

- Collaborated with CSULB's Solid Rocket Propulsion and Combustion Lab to process propulsion data.
- Programmed an image detecting algorithm for resolving fuel grain structure in solid rocket combustion.
- Utilized MATLAB's image processing library to segment and classify high speed camera footage.

ACTIVITIES

Columbia Space Initiative September 2020 - June 2024
Rocketry Co-Lead *New York, NY*

- Led Columbia's competitive collegiate hybrid rocketry program of 40+ students during my senior year.
- Responsible for the design, analysis, and construction of cold fluid systems on the rocket.
- Created pyrotechnic valves, oxidizer tanks, data servers, N2O plumbing systems, and CFD tutorials.

Columbia University Robotics Club September 2020 - June 2023
Co-President *New York, NY*

- Managed a diverse team of engineers in several aerospace robotics competitions and led the club as president.
- Analyzed an ISRU system arcitechture for mining ice on the Moon as a part of NASA's 2022 Break the Ice Lunar Challenge.
- Won a $25,000 USD prize from NASA for the design, beating several high-profile aerospace firms.

TECHNICAL SKILLS

Programming	Python, C, Fortran, CUDA, Torch, NumPy, Pandas, SciPy, Julia, SciML.jl
Engineering Software	SolidWorks, Ansys Fluent, MATLAB, FEnICS, Fusion360, OpenFOAM
Relevant Courses	Differential Equations, FEM, Fluid Mechanics, Thermodynamics Heat Transfer, Computational Fluid Dynamics, Linear Algebra, Elasticity