

Marcus Rocco Fratarcangeli

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PROFESSIONAL SUMMARY

Mechanical engineering thesis-track master from Georgia Tech with expertise in autonomous systems, additive manufacturing, and machine learning, demonstrated through a self-driving lab for photopolymer synthesis and testing. Skilled in SolidWorks, Python, and automation, excels in designing innovative solutions and collaborating in cross-functional teams to advance technology in autonomous systems, defense, AI, or manufacturing.

EDUCATION

Georgia Institute of Technology

Atlanta, GA

Master of Science in Mechanical Engineering

August 2023 – August 2025

Major area: Manufacturing, Minor area: CAE/Design

Cumulative GPA: 3.71/4.0

Thesis topic: “Self-Driving Lab of Photopolymer Synthesis and Mechanical Testing for Material Discovery”

Quinnipiac University

Hamden, CT

Bachelor of Science in Mechanical Engineering

August 2019 – May 2023

Minors: Entrepreneurship and Mathematics

Cumulative GPA: 3.95/4.0, Engineering GPA: 4.0/4.0

SKILLS

SolidWorks

Python

Machine Learning

Automation

Polymer 3D Printing

Digital Image Correlation

Robotics

Arduino

MATLAB

Metrology

Problem Solving

Design for Manufacturing

Microsoft Excel

Microsoft Word

Microsoft PowerPoint

Public Speaking/Presentation

Project Management

Leadership

RESEARCH EXPERIENCE

Active Materials and Additive Manufacturing (AM²) Lab

Atlanta, GA

Graduate Research Assistant

August 2023 – August 2025

- Created a custom, high-throughput, autonomous electromechanical tensile testing system which included a force sensor mounted to a robotic arm, automated sample clamp, cameras for digital image correlation, and anomaly detection using machine learning that can test and collect data on 48 samples in under two hours
- Made an autonomous curing kinetics system which tests the curing time, temperature, and realizability of photopolymer inks during the polymerization reaction to efficiently determine viability for DLP 3D printing
- Designed and assembled a high-throughput photopolymer composition system enabled by a robotic arm, bespoke closed loop liquid dispensing system, and a custom powder dispensing device which can automatically create and mix photopolymer inks without human intervention
- Created a self-driving lab system for discovering novel photopolymers by integrating automated data analysis for the tensile testing and curing kinetics systems into a GitHub repository to support an active learning model

National Science Foundation REU HYPER – University of Central Florida

Orlando, FL

Undergraduate Research Fellow

May 2022 – August 2022

- Researched biocompatible resins with tunable mechanical properties for use in additively manufactured bone scaffolds and seeding stem cell generation with Professor Dazhong Wu
- Designed and printed microscopic TPMS scaffolds and tensile specimen using vat photopolymerization and performed mechanical tests and data analysis using Python

Danbury Hospital – NuVance Health*Undergraduate Research Fellow*

Danbury, CT

January 2022 – May 2022

- Researched endoleaks and endotension in aortic surgical stents and grafts using an enlarged physical artery model and additive manufacturing of several components

PROFESSIONAL WORK EXPERIENCE**Calspan Corporation – Advanced Solutions***Mechanical Engineering Intern*

Ronkonkoma, NY

May 2021 – August 2021

- Composed an additive manufacturing database from reviewing technical documentation that contained current and experimental methods for printing plastic and metal parts, and unique materials with respective properties
- Designed several iterations of copper, water-cooled, instrumentation rakes to take measurements of flow and temperature for a contracted prototype scramjet engine for use in effector applications
- Iterated designs of an exhaust port for a wave heater to be 3D printed in copper and Inconel 625 to withstand a temperature of 4000F with complex helical cooling patterns around a converging-diverging nozzle

ACADEMIC PROJECT EXPERIENCE**Photopolymer Property Learning***Data Foundations and Machine Learning*

Atlanta, GA

August 2024 – December 2024

- Completed a project which analyzed a dataset of photopolymer compositions and their respective properties, such as modulus of elasticity, degree of conversion, and glass transition temperature using statistical techniques such as Pearson correlations and histograms
- Extracted relationships between monomers, concentrations, and output properties using random forest regression and presented the results using residual plots and error metrics

Lattice Structures as Heatsinks*Finite Element Method*

Atlanta, GA

January 2024 – May 2024

- Worked in a team of three to demonstrate the effectiveness of lattice structures as heatsinks using various analysis methods, such as direct coefficients matrix, finite difference, and a commercial software package

QUBEsat*Mechanical Engineering Senior Design*

Hamden, CT

May 2022 – May 2023

- Led a team of three senior engineering students to design and build a CubeSat from concept to working model utilizing a bespoke 3D printed frame with an integrated thermal sensing apparatus
- Developed a project plan, assigned roles, conducted research, and coordinated with outside experts
- Presented the final product at the ASEE Zone 1 Conference and received an Award for Excellence

CAMPUS & COMMUNITY INVOLVEMENT*Mentor, Georgia Tech ENGAGES Program*

May 2024 – May 2025

- Mentored an Atlanta high school student in a subset research project developing an algorithm for analyzing tensile data which was presented at the state science fair
- Guided the student in understanding engineering and research concepts to further their personal development

Vice President, Eta Pi Engineering Honor Society

August 2022 – May 2023

Vice President, Quinnipiac Club Powerlifting Team

August 2022 – May 2023

Eagle Scout, Boy Scouts of America

May 2019 – Present

HONORS AND AWARDS*NCEES Fundamentals of Engineering (FE)*

May 2024

Quinnipiac University Outstanding Achievement in Mechanical Engineering

May 2023

Dassault Systems SOLIDWORKS Associate Mechanical Design

May 2023

ASEE National Internship Student of the Year Finalist

December 2022

Quinnipiac University Dean's List

December 2019 – May 2023