

# Michael Burgess

mjburgessjr@gmail.com • +1 (603) 834-5898 • [github.com/mburgjr](https://github.com/mburgjr)

## EDUCATION

---

**Massachusetts Institute of Technology (MIT)** / *M.S. Candidate in Mechanical Engineering* May 2025

Will begin graduate studies in the Fall of 2023, researching topics in robotic control and path planning.

**Massachusetts Institute of Technology (MIT)** / *B.S. in Mechanical Engineering* May 2023

Courses: Underactuated Robotics, Bio-inspired Robotics, Dynamics & Control, Machine Learning, Algorithms

GPA: 5.0 / 5.0, GRE: 170 Quant / 160 Verbal, SAT: 1520/1600, SAT Math II: 800/800

## WORK & RESEARCH

---

**MIT Biomimetic Robotics Lab** / *Undergraduate Researcher* Jan. 2022 - May 2023

- Performing research on trajectory planning over non-flat terrain for a quadruped (cheetah-like) robotic system.
- Developing a novel controller that decouples kinematic and dynamic constraints to enable online planning over rough terrain.
- Primary work done in Matlab using Casadi package, requires knowledge of algorithms, non-linear optimization, RRT.

**Markforged** / *Software Engineering Intern* May 2022 - Aug. 2022

- Wrote simulated annealing based algorithm to improve printer bed packing, thereby increasing number of parts per print
- Researched and tested solutions over the course of the summer. All code was written in Typescript.
- Learned a lot about the day-to-day workflow as a software engineer. Held meetings and gave presentations.

**NASA Langley Research Center** / *Engineering Intern* Jan. 2021 - May 2021

- Optimized convolutional neural networks that estimate where a fluid flow becomes turbulent along the surface of an airfoil.
- These models predict the amplification rate of instabilities over the wing based on flow profile.
- Incorporated these models into flight simulation solvers for practical use in minimizing viscous drag.

**General Motors (GM)** / *Controls Engineering Intern* May 2020 - Aug. 2020

- Automated standard hardware-in-the-loop test cases for engine controller software using Python and dSpace.
- Built code libraries to locate and diagnose errors across cars' control communication network.
- Required knowledge of multiple coding languages and control theory to investigate and resolve nested issues in software.

**Brayton Energy** / *Mechanical Engineering Intern* May 2019 - Aug. 2019

- Designed an intake block for the receiver of a high temp concentrated solar power system, using Solidworks and ANSYS.
- Data points from static and thermal-fluid simulations used to generate plots and parametrically design parts.
- Other work was done in materials research, creep and fatigue estimation, and thermal conductivity experimentation.

## ACTIVITIES & PROJECTS

---

**MIT Global Teaching Labs (GTL) – Italy** Jan. 2020

- Spent a month in Rho, Italy teaching robotics concepts to high school students.
- Created and taught my own curriculum of circuits and PID control systems, including lectures, exams, and experiments.

**Electric Skateboard** Feb. 2019

- Designed and constructed an electrical circuit and mechanical drive train for a homemade motorized skateboard.
- Used CNC to cut a custom-designed adjustable motor bracket, which holds together a pulley drive-train system.

**MIT Momentum Design Competition** Jan. 2019

- Prototyped an embedded system that alerts ride-share passengers of any forgotten items detected in the vehicle.
- Connected speakers and an array of lights to a Raspberry Pi running object recognition software with the help of Arduino.

## TECHNICAL SKILLS

---

**Software:** NLP | Machine Learning | Python | C++ | Matlab | Drake | Typescript | React | Linux

**Mechanical:** Solidworks | Autodesk | Fluids | FEA / CFD Simulation | CNC | Lathe

**Hardware:** Arduino | Raspberry Pi | Circuits | Simulink | LabView | Soldering