

# Theo Gerst

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## EDUCATION

- Massachusetts Institute of Technology**, Cambridge, Massachusetts Expected Graduation: May 2027
- **Relevant Coursework:** Fundamentals of Programming, Multivariable Calculus, C and Assembly, Linear Algebra, Discrete Math, Real Analysis, Algorithms, Abstract Algebra I, Theory of Computation, Computation Structures, Differential Equations.
  - **Majors:** Pure Mathematics and Computer Science, **Cumulative Undergraduate GPA:** 5.0/5.0.

## EXTRACURRICULARS

- MIT Motorsports**, Cambridge, Massachusetts September 2023 – Present
- Firmware Engineer**

- In 2024 season, wrote firmware for dashboard and custom inverters. Tested our telemetry system.
- Currently leading firmware subteam, writing code for our two main PCBs: vehicle control unit and battery management system.
- Use STM32s with embedded C++, RTOS, SPI/ISOSPI, I2C, CANFD, time series databases, asynchronous procedures.

- MIT Arcturus**, Cambridge, Massachusetts September 2023 – May 2024
- Autonomy Lead**

- Designed and implemented controls system for autonomous boat. Also designed path-generating algorithm to navigate through cones, emergency stop system. Used Python and C++ with ROS2, RViz, Gazebo.

- FIRST Robotics, Team 5419**, Berkeley, California August 2019 – June 2023
- Software Lead**

- Wrote robot code for teleoperated and autonomous control. Implemented tank drive and swerve drive, localization with Limelight and April tags, and state machine-based procedures.
- Won Autonomous Award in 2022 out of 43 teams, Innovation in Control Award in 2023 out of 46 teams.

## EXPERIENCES

- Lawrence Berkeley Lab, AMCR Division**, Berkeley, California June 2024 – August 2024
- Research Assistant**

- Researched the behavior of various neuromorphic computation models. Learned factoring algorithms and designed an implementation for the General Number Field Sieve on a neuromorphic computer. Wrote a 16-page paper on the algorithm.
- Simulated the neuromorphic computer with Python, using numpy and Intel's Lava framework.

- UC Berkeley Model Predictive Control Lab**, Berkeley, California June 2023 – August 2023
- Intern**

- Controlled 6-DOF robotic arm. Designed motion procedures, traced image contours on whiteboard.
- Ran custom simulations to predict robot behavior. Used Python and C++ with ROS, RViz, Gazebo.

## PROJECTS

- RAIN**, Cambridge, Massachusetts June 2024 – Present
- Game Developer**

- Working alongside one other developer to develop a high quality RPG using Unreal Engine 5.
- Developing skills with C++, Unreal Engine, and game design.

- Radish**, Berkeley, California February 2022 – October 2022
- Programming Language Developer**

- Designed and implemented [Radish](#), a dynamically-typed programming language similar to JavaScript.
- Wrote lexical analyzer, parser, interpreter, an [IDE language extension](#) for autocomplete and highlighting, and a [standard library](#).
- Used C# for the language, Node JS for the language extension.

- Discits**, Berkeley, California November 2020 – February 2022
- Game Developer**

- Designed and implemented [Discits](#), a large text-based RPG similar to Pokemon that runs via a messaging app.
- Implemented database collection system, battle system, map system.
- Used Node JS with mongoose for reading/writing to MongoDB.

## SKILLS

- **Programming Languages/Frameworks:** Python, C/C++, Node JS, C#, RISC-V Assembly, Java, Kotlin, Lisp, HTML/CSS/JS, ROS(2), STM32, RTOS, Unreal Engine, Git, Bash.