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.