Zachary Paul Gunther

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Education

Rensselaer Polytechnic Institute Troy, NY | August 2019 - May 2023

- Bachelor's of Computer Science & Computer Engineering Dual Major, 3.70 GPA
- Focus on Robotics, Control Systems, and Computer Graphics

Professional Experience

Automation Engineering Internship *Intuitive Surgical* | May 2022 - August 2022 | Sunnyvale, CA

- Created C# GUI applications controlling robotic assemblies for manufacturing
- Used and improved a custom state-machine-based automation framework
- Debuggeed & tested applications for controlling a UV laser marker and a 5-axis robotic arm
- Wrote documentation for and validated automated systems

Electrical Engineering Co-op *SimpliSafe* | August 2021 - January 2022 | Boston, MA

- Wrote web applications using JS for video & image quality analysis (noise & color accuracy)
- Designed equipment and setups for camera testing and automation
- Wrote a GUI Python PyQt6 application for flashing broken cameras, as well as designed and prototyped custom PCBs for a fully automated process. Recovered over 4000 cameras

Automation and Control Engineering Internship *Cree* | May 2020 - August 2020 | Durham, NC

- Created GUI applications for data collection, analysis, and storage in VB.Net & C++
- Learned mySQL and implemented data collection and visualization applications
- Implemented algorithms for high-speed discrete signal processing for audio analysis

Relevant Experience & Projects

EasyGL Graphics Library Development (See portfolio & Github) Summer & Fall 2022

- Designed and implemented a graphics abstraction layer for easily rendering basic 3D objects
- Initially implemented in Java for OpenGL abstraction and later translated to JavaScript for WebGL
- Designed to accept vertice, indice, color, and position information for triangle-based meshes
- Handles distance sorting for transparent meshes with ambient, directional, and reflective lighting

Web-Based Analog Circuit Simulator (See portfolio) Spring 2021

- Created a web-based analog circuit simulator that can simulate basic analog components
- Reduces dynamic components and uses many DC steady-state nodal analysis iterations to simulate
- Used JavaScript, HTML, and the 2D canvas context for rendering custom GUI components

Machine Learning For Games & More (See portfolio) Fall 2022

- Created neural network classes in both Python and Javascript for training and using small networks
- Implemented generation-based, gradient, and stochastic descent learning, with relu or tanh, activation
- Tested on MNIST dataset for character recognition & real-time learning snake game

ReactJS & NodeJS Grading Platform Development (Ongoing) Spring 2023

- Built a single-page React application (JavaScript, HTML, CSS) for auto-grading basic assignments
- Uses NodeJS backend with PostgreSQL database, and runs on an AWS EC2 instance (for now)
- Allows for easy creation of Google Forms-like assignments with multiple choice, text & numerical response, and basic equations

Mini-Projects Spring 2021 - Present

- Created WebGL raytracing engine that compiles primitive objects into shader for real-time raytracing
- Made a C++ application using FFMPEG & OpenCV for removing idle frames from videos
- Created an application for image noise removal with median smoothing and edge preservation