Neal Cronin

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Education

Georgia Institute of Technology — Atlanta, Georgia
Bachelor of Science in Computer Science — *August 2024 - Present*
Courses: *Artificial Intelligence, Objects and Design, Computer Organization and Programming, Data Structures and Algorithms, Discrete Math*

Experience

Georgia Tech Research Institute (GTRI) — Atlanta, Georgia
Research Intern (STEM@GTRI) — *June 2023 - July 2023*

Autonomous Robotics: Collaborated in the CIPHER lab to develop navigation code for an autonomous robot using a LIDAR sensor for environment mapping.

Data Structures: Optimized LIDAR data storage and accessibility using Quadtrees to enable efficient spatial indexing and real-time visualization.

Data Visualization: Utilized MatPlotLib to create accurate visual representations of robot surroundings for safety testing.

Projects

Tissue-Integrated Bionic Knee: Modeled the e-OPRA^{TM} Implant System from specifications listed in technical drawings to render visuals used in the paper.

Tony Shu et al. ,Tissue-integrated bionic knee restores versatile legged movement after amputation.Science389,eadv3223(2025).DOI:10.1126/science.adv3223

OTIS Challenge: Won 2nd place ($15,000) for a solution focused on inclusive mobility and climate change. I led the development of a functional "breathing vest" prototype that utilized piezoelectric sensors to harness energy from chest expansion during breathing.

Osu! World Cup Prediction Model: Built a predictive neural network using PyTorch to forecast international tournament outcomes. I developed a custom data pipeline to ingest player statistics, match history, and beatmap metadata via the osu! API and the rosu-pp library to create the training dataset.

RoboSumo Robot: Led a multi-disciplinary team to develop a combat robot under SRS Robothon rules. I designed the chassis and mechanical assemblies in Onshape, managed the physical assembly and wiring (including 3D printing and CNC machining), and programmed the autonomous logic in C++ to integrate IR and line sensors for opponent detection.

VEX Robotics World Championship: Developed high-speed autonomous routines using C++ PID controllers, achieving drivetrain precision that earned a qualification for the World Championship

Hall Effect Keypad: Reduced input latency by modifying open-source firmware for the RP2040 microcontroller to support analog actuation points, outperforming standard mechanical switches in high-frequency performance

Combat Robotics: Designed "Cat5," a 1lb ant-weight robot, using Fusion 360 to optimize for weight distribution and durability. I executed the full build process, including high-clearance 3D printing and precise soldering of compact ESC and receiver components.

Home Game Server: Configured a dedicated Ubuntu server with customized DHCP and DNS settings for private game hosting.

Honors and Awards

HOPE Scholarship: $40,000 for college tuition.

OTIS 2nd Place Nationally: $15,000 for high school.

Laws of Life Essay School Winner: $100 prize.

Skills Summary

Platforms: Linux (Ubuntu), Windows, Arduino, Raspberry Pi

Software: PyTorch, TensorFlow, MatPlotLib, Django

Hardware: Soldering, 3D Printing, Makerspace Trained

CAD: Autodesk Fusion 360, Autodesk Inventor, Onshape

References

Brandon Horsley: Former Robotics Coach – bhorsleyphysics@gmail.com

Stephen Cochran: Former Mechatronics Teacher – Stephen.Cochran@gcpsk12.org