

# Neal Cronin

Github: [github.com/NealCronin](https://github.com/NealCronin)

Portfolio: [nealcroninportfolio.pythonanywhere.com](http://nealcroninportfolio.pythonanywhere.com)

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## EDUCATION

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### Georgia Institute of Technology

Bachelor of Science in Computer Science

Courses: Artificial Intelligence, Objects and Design, Computer Organization and Programming, Data Structures and Algorithms, Discrete Math

Atlanta, Georgia

August 2024 - Present

## EXPERIENCE

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### Georgia Tech Research Institute (GTRI)

Atlanta, GA

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

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**Tissue-Integrated Bionic Knee:** Modeled the e-OPRA™ 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. *Science* 389, 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:** Qualified and competed at the global level (2024) by programming a robot capable of high-speed autonomous scoring. I optimized C++ PID controllers for drivetrain precision.

**Hall Effect Keypad:** Engineered a custom analog keypad using hall effect sensors for high-frequency rhythm game performance. I modified open-source firmware to support adjustable actuation points, significantly reducing input latency compared to mechanical switches.

**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

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**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

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**Software:** PyTorch, TensorFlow, Matplotlib, Django

**CAD:** Autodesk Fusion 360, Autodesk Inventor, Onshape

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

**Hardware:** Soldering, 3D Printing, Makerspace Trained

## REFERENCES

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**Brandon Horsley:** Former Robotics Coach – [bhorsleyphysics@gmail.com](mailto:bhorsleyphysics@gmail.com)

**Stephen Cochran:** Former Mechatronics Teacher – [Stephen.Cochran@gcpsk12.org](mailto:Stephen.Cochran@gcpsk12.org)