

# Thomas Bird

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## EDUCATION

### Rensselaer Polytechnic Institute

*B.S. in Computer Science; Leadership Scholarship; Dean's List*

Troy, NY

Aug. 2021 – May 2025

## EXPERIENCE

### Machine Learning Researcher

*Rensselaer Polytechnic Institute*

August 2023 – Present

Troy, NY

- Supported the research and implementation of a new unsupervised method for detecting geometric anomalies in high-resolution 3D point clouds, adapting established 2D anomaly detection techniques to three dimensions.

### Software Engineer Intern

*Route4Me*

June 2023 – August 2023

Tampa, FL

- Developed Route4Me's Python SDK, enhancing software quality by identifying and debugging HTTP errors and implementing existing features from the Java and C# SDKs in order to provide clients with proper API access.
- Constructed a robust web scraper leveraging Python, Selenium, BeautifulSoup, Pandas, and Requests, automating and enhancing data collection processes.

### React Developer

*Aixus Health*

May 2023 – Sep 2023

Albany, NY

- Spearheaded the development of a patient-focused MVP application for Aixus Health utilizing React Native, creating an intuitive and user-friendly interface.
- Linked the front ends for iOS, Android, and web through a database hosted on Supabase.

## PROJECTS

### iOS Fitness Application | *SwiftUI, Mapbox, Firebase, Git*

November 2022 – Present

- Led development on an iOS application programmed in Swift with SwiftUI, integrated location features with Mapbox's mapping SDK, and connected online features to an updating database via Firebase.
- Developed an algorithm to generate random running routes on a map that start and finish at the same destination and span a specified length derived from the Dijkstra's and 5Sum algorithms.

### Machine Learning Agents | *Unity, C#, ML-Agents, PyTorch, Python, TensorFlow*

April 2023

- Trained multiple agents to defeat a boss character using PyTorch in a Unity "bullet hell" game.
- Employed TensorFlow for data visualization and tracking of algorithm performance throughout the training process in order to author a research paper on the project, effectively summarizing the procedures, results, and insights derived from the work.

### Assembly Compiler | *C, Assembly*

March 2022

- Developed a compiler in C that processes and converts basic C code to working MIPS instructions for Assembly.
- Programmed capabilities for basic math instructions (add, subtract, multiply, divide), looping, and functions.

### Project Homepage | *HTML, CSS, JavaScript*

March 2022 – Present

- Programmed and stylized my personal web-page with HTML, CSS, and JavaScript viewable at "birdev.net."

### A\* Pathfinder | *Unity*

March 2023

- Converted map data from the game "Dragon Age" into Unity2D, then applied A\* path-finding on programmatically placed way-points to generate feasible and efficient routes between location sets.

### Math Web Game | *HTML, CSS, Javascript, Node.js*

November 2021

- Developed a space-themed math web-game for a Hackathon within a 24-hour constraint capable of problem difficulty ranging from basic algebra to Calculus 2 with randomly generated integral problems.

## TECHNICAL SKILLS

**Languages:** C, C++, C#, Python, Java, Swift, Assembly, JavaScript, HTML, CSS, SQL, LaTeX, Dafny

**Frameworks:** Git, React, Unity, Node.js, JUnit, Valgrind, GCP, Firebase, Supabase, VS Code, Visual Studio, Eclipse

**Libraries:** Pandas, TensorFlow, ML-Agents, Bootstrap, Selenium, BeautifulSoup, Requests

**Relevant Coursework:** Data Structures, Algorithms, Computer Organizations, Principles of Software, Intro to Artificial Intelligence; Discrete Math, Modern Binary Exploitation, Computational Geometry, Game AI, Database Systems, Software Design and Documentation, Multi-variable Calculus, Differential Equations