

# Thomas Bird

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## EDUCATION

### Rensselaer Polytechnic Institute

Troy, NY

*B.S. in Computer Science; Leadership Scholarship; Dean's List; 3.37 Cumulative GPA*

*Aug. 2021 – May 2025*

## WORK EXPERIENCE

### United Launch Alliance

May 2024 – July 2024

*Software Engineer Intern - Flight Simulation*

*Denver, CO*

- Led the standardization of Python environments for an integrated test suite simulating space flight for NASA's Artemis II and III missions' Interim Cryogenic Propulsion Stage (ICPS), ensuring consistent, reliable simulations.
- Developed new Bamboo build plans to automate testing, report parsing, and package distribution on the internal network, reducing manual effort by 80%, and reducing deployment time by over 300% for over 40 internal tools.
- Enhanced and modernized automation and build tools, as well as setup configuration, for software responsible for booting the simulation, queuing users, and archiving run logs, streamlining development processes and removing over 400 trivial run log output lines, enhancing overall project clarity and maintainability.

### Route4Me

June 2023 – August 2023

*Software Engineer Intern - REST API*

*Tampa, FL*

- Developed and optimized Route4Me's Python SDK; utilized flake8 linting and formatting to standardize and enhance code readability across 40+ production files, leading to efficient resolution of HTTP errors.
- Migrated and integrated feature sets from Route4Me's Java and C# SDKs into the Python SDK, employing rigorous unit testing to ensure seamless API functionality and compatibility for clients.
- Constructed an advanced web scraper with Selenium WebDriver, BeautifulSoup, pandas, and requests, resulting in automation and enrichment of data acquisition processes enabling marketing content strategies.

## PROJECTS

### OpenCV Image Mosaic Generator | *Python, OpenCV, NumPy, SIFT, RANSAC*

April 2024

- Engineered an advanced image mosaic generator capable of seamlessly blending any number of images taken of the same scene into a single, high-resolution composite picture, effectively increasing the image quality.
- Employed a number of Computer Vision techniques, such as SIFT, Flann-based matching, and RANSAC.
- Creating matrix algebra algorithms that leverage the OpenCV and NumPy libraries.

### Geometric Floor Plan Analyzer | *C++, CGAL, Qt5*

November 2023

- Developed a floor plan analysis that outputs which wall spaces are most visible in a given 2-dimensional floor plan.
- Leveraged various Computational Geometry techniques such as raycasting, Delaunay triangulation, Minkowski sums, and blue noise to compute a visibility heat mapping for floor plans.

### Context Aware 3D Visualizer | *JavaScript, AWS EC2, Node.js, model-viewer, APIs*

October 2023

- Created 'Readee,' a Chrome extension that visualizes terms in 3D using Google's model-viewer, alongside contextual definitions sourced from an LLM via an API, all within a 24-hour hackathon timeframe.
- Engineered the backend on Amazon AWS EC2 using Node.js, ensuring robust and scalable infrastructure for real-time data processing and visualization, as well as efficient access to cached queries.

### Cooperative Multi-Agent ML System | *Python, C#, PyTorch, TensorFlow, Unity*

April 2023

- Created a Unity simulation environment wherein multiple agents can learn in tandem to beat a 'bullet hell' game.
- Used PyTorch to create a robust and scalable training ecosystem, resulting in a successful neural network.
- Applied TensorFlow to visualize and track algorithm performance data throughout the 70-million steps of training.

## SKILLS

**Technical:** C, C++, C#, Python, Java, Swift, Assembly, JavaScript, HTML, CSS, PostgreSQL, LaTeX, Dafny, Git, React, Unity, Node.js, REST APIs, JUnit, Valgrind, Vim, Firebase, OpenCV, CGAL, Anaconda, Pandas, NumPy, PyTorch, TensorFlow, ML-Agents, Tailwind, Selenium, BeautifulSoup, Requests, BitBucket, Bamboo, Jira

**Relevant Coursework:** Data Structures, Algorithms, Reinforcement Learning, Discrete Mathematics, Binary Exploitation, Computational Geometry, Game AI, Relational Databases, Database Management, Agile Methodologies, Embedded Systems, Operating Systems, Computer Vision, Multi-variable Calculus, Differential Equations