NOLAN **LIZMI**

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EDUCATION

Cornell University, College of Arts & Sciences *Expected May 2027*
Degrees: Bachelor of Arts in Computer Science, Bachelor of Arts in Astronomy *Ithaca, NY*
GPA: 4.023 / 4.3
Relevant Coursework: Computational Imaging, Computer Graphics, Compilers, Multiwavelength Astronomical Techniques, Planetary Surface Processes, Modeling and Machine Learning in Astronomy, Systems Programming, Quantum Computing, Galaxies & Cosmology, Engineering Mathematics Sequence, Introductory Physics Sequence, Analysis of Algorithms, Functional Programming, Discrete Structures, Object-Oriented Programming

RELEVANT EXPERIENCE

Cornell Computational Imaging Lab *January 2026–Present*
Undergraduate Research Assistant under Kristina Monakhova *Ithaca, NY*
- Applying differentiable rendering techniques to Transiting Exoplanet Survey Satellite data for improved exoplanet detection.
- **Summer 2026:** Employed as a full-time student researcher in the Cornell Bowers Undergraduate Research Experience (BURE) program for ten weeks; will present my work at a concluding program-wide symposium.
- Utilizing Python's ecosystem of numerical and astronomical packages, including PyTorch, for efficient computation.
- Conducting thorough literature reviews of papers in signal processing, optics, physically-based rendering, and astronomy.
- Meeting frequently with collaborators across fields, including Lisa Kaltenegger of the Cornell astronomy department.

Cornell ALPS (Algorithms for Large-Scale Parallel Systems) Lab *February–December 2025*
Undergraduate Research Assistant under Giulia Guidi *Ithaca, NY*
- Accelerated genomic analysis algorithms using sparse linear algebra and concurrency techniques in heterogeneous memory.
- **Summer 2025:** Employed full-time in the BURE program.
- Developed in CUDA C++, collected data using Bash and Python, and utilized external libraries for CPU/GPU acceleration.
- Utilized software such as Slurm on NERSC's Perlmutter supercomputer to develop, execute, and benchmark computations.

CS 3410 (Computer Systems Organization & Programming) *August–December 2025*
Undergraduate Teaching Assistant *Ithaca, NY*
- Held weekly in-person office hours to assist students with conceptual understanding and assignment completion.
- Led and facilitated weekly in-person Lab sections where students were led through difficult concepts from lecture.
- Worked in groups of TAs to rework assignments, develop assignment handout materials, and grade student submissions.

PROJECTS

CS 4120/4121 (Compilers) Project *January–May 2026*
Compiler for the ρ (Rho) and η (Eta) programming languages *Ithaca, NY*
- Engineered an optimizing compiler for η, a statically-typed imperative language, and later the object-oriented extension ρ.
- Worked efficiently in a small team of three students under self-direction, utilizing GitHub for version control.
- Communicated clearly and frequently with teammates about goals, work division, and implementation.
- Carefully constructed Java code for all stages of compilation, including code optimization, in a containerized environment.
- Co-authored several comprehensive engineering reports detailing technical specifications and issues encountered.

CS 4620 (Computer Graphics) Final Project *December 2025*
Tim, Destroyer of Worlds *Ithaca, NY*
- Developed an interactive 3D "planet destruction" demo in less than a week, coordinating within a small group of students.
- Extended a course-provided TypeScript library for 3D rendering, itself based on Three.js, to develop our demo.
- Implemented and utilized graphics techniques including marching cubes, procedural generation, and signed distance fields.

Video Game Project with the Cornell Development in Games Association *July–August 2024*
"Completely Hammered" (link to itch.io page) *Remote*
- Developed a full video game over the course of five weeks, coordinating with a team of around twelve Cornell students.
- Became closely familiar with GitHub and Unity as I assembled game objects and programmed game components in C#.
- Created and released a substantial update for the game with two other team members following the initial release.

TECHNICAL SKILLS & PERSONAL DETAILS

Programming Languages: C/C++, Rust, Java, Bash, OCaml, C#, Python, TypeScript, RISC-V Assembly, x86 Assembly, MATLAB
Mathematics: Multivariable calculus, differential equations, linear algebra, signal processing, convex optimization, probability
Physics: Mechanics, special relativity, electromagnetism, waves and oscillations, basic quantum physics
Development Software: Git, GNU/Linux, Docker/Podman, Visual Studio Code, Unity, Godot, QGIS, Helix text editor, LaTeX

Hobbies: Birdwatching; playing trumpet, flugelhorn, and electric guitar; playing and developing video games; watercolor painting
Favorite Books: The Lord of the Rings by J. R. R. Tolkien; House of Leaves by Mark Z. Danielewski
Miscellaneous Interests: Music, visual art, graphic design, nature, linguistics, evolutionary biology, geoscience, geography