Žiga Kovačič

zk66@cornell.edu linkedin.com/in/ziga-kovacic zzigak.github.io github.com/zzigak +1 (585) 910-5214

Education

Cornell University Ithaca, NY

B.A. in Computer Science and Mathematics | **GPA: 4.16/4.0** Aug 2022 - May 2025

- ▷ **Relevant courses:** Graphics (A+), (Grad) Computation for Content Creation (A), Machine Learning (A+), Algorithms (A+), Intro to Probability (A+), Honors Discrete structures (A+), Linear algebra (A+), Numerical Analysis (A), Reinforcement learning (A), Honors Real Analysis II (A+), Digital Logic and Computer Organizations (A+), Embedded Systems (A), Networks (A+), Honors Object Oriented Programming and Data Structures (A)
- ▷ **In progress:** (Grad) 3D Computer Vision, (Grad) Computational Imaging, (Grad) Program Synthesis, (Grad) Special Topics in CV: Dynamics

Research Experience

Cornell Graphics & Vision Lab | Advisor: Abe Davis Ithaca, NY

Undergraduate Researcher Jan 2023 - Present

- ▷ **Spring 2024 - Present:** Working on physically plausible re-simulations of objects using modal analysis and Gaussian Splatting.
- ▷ **Summer 2023 - Spring 2024:** Worked on Time Lapse Video Generation with Independent Control over Deep Latent Features (Submitted to SIGGRAPH 2024)
- ▷ BURE REU: Awarded 10000$ to fund research in summer of 2023 and 2024

Cornell University Artificial Intelligence | with Meta AI Ithaca, NY

Vice President & Undergraduate Researcher August 2023 - Present

- ▷ Do research in machine learning, computer graphics, and vision in collaboration with professors at Cornell and other ML researchers. Lead and participate in weekly research paper reading groups.

Teaching Experience

Cornell University, Teaching Assistant

- ▷ **CS 4782:** Introduction to Deep Learning Spring 2025
- ▷ **CS 4620:** Introduction to Computer Graphics Fall 2024
- ▷ **CS 4780:** Introduction to Machine Learning. Award: Course Staff Exceptional Service Award Spring 2024
- ▷ **CS 2110:** Object Oriented Programming and Data Structures, Spring 2023

Projects

Caustics and Water surface simulation — Graphics final project Top Submission December 2023

- ▷ Implemented Multi-pass rendering, screen space refractions, shadow mapping, height fields, environmental mapping, and time-varying environmental map.

Ray Tracing — Graphics creative project Top Submission December 2023

- ▷ Implemented constructive solid geometry rendering, distributed ray tracing, reflections and refractions, anti-aliasing, fractal rendering, BVH speedup structure, etc.

MelodyMesh — Grad course final project April 2023 - May 2023

- ▷ Built a 3D music visualizer that deforms a mesh based on dominant frequencies in a sound recording.
- ▷ Used a graphics library Three.js to render deformations of 3D objects loaded from .obj mesh files in real-time on a website.
- ▷ Used signal processing theory and FFT algorithm to obtain the dominant frequency bins of a sound in real-time and map them to deformations of the mesh using spherical harmonics and Legendre polynomials.

Simulating Evolving Artificial Life Oct 2022 - Dec 2022

- ▷ Build a simulator game of a world where animals wander around, eat, reproduce, and evolve.
- ▷ Build a parser converting a program into an AST, language interpreter using the visitor pattern, and GUI using JavaFX.

Work Experience

National Research Institute, Parallel Computing & AI Lab Slovenia

Software Engineering Intern June 2021 - Aug 2022

- ▷ Explored and evaluated methods for binding code from sizable C++ projects (maxCliqueSearch) to Python to make it more accessible to 10+ research teams to reuse in further research.
- ▷ Wrote detailed documentation on GitLab for using the C++ library and improved the program's CLI functions.
- ▷ Collaborated in smart assistant development for oil refineries.

Technical Skills

Languages: Python, Java, JavaScript, C/C++, LaTeX, Markdown, Typst
Libraries: PyTorch, Numpy, WebGL, Three.js, rawpy, JavaFX