Žiga Kovačič

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EDUCATION

Cornell University — Ithaca, NY
B.A. in Computer Science and Mathematics | **GPA: 4.17/4.0** — Aug 2022 - May 2025
- ▷ **Relevant courses:** Honors Object Oriented Programming and Data Structures (A), Linear algebra (A+), Honors Discrete structures (A+), (Grad) Computation for Content Creation (A), Intro to Probability (A+), Digital Logic and Computer Organizations (A+), Embedded Systems (A), **In progress:** Algorithms, Machine Learning, Graphics, Networks.

ACADEMIC EXPERIENCE

Cornell Graphics & Vision Lab | Advisor: Abe Davis — Ithaca, NY
BURE Research Intern — May 2023 - August 2023
- ▷ Worked on Time Lapse Video Generation with Independent Control over Deep Latent Features.
- ▷ Trained a deep learning Latent diffusion model (LMD) and used a time varying temporal feature volume of NeRF and DINO semantic features to generate smooth and geometrically coherent time lapse videos from sparse data.
- ▷ Received $6000 research award from BURE research program.

CUAI — Ithaca, NY
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.

Cornell CIS — Ithaca, NY
Teaching Assistant — January 2023 - Present
- ▷ Lead 2-hour academic workshops weekly with a co-instructor for an Object oriented programming and data structures class.
- ▷ Prepared worksheets, presentations, and implemented them in modern active-learning approaches.

WORK EXPERIENCE

National Research Institute, Parallel Computing Lab — Slovenia
Software Engineering Intern — June 2022 - 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.
- ▷ Tested and verified correctness of the C++ code base in a Linux environment to achieve expected functionality.

National Research Institute, AI Lab — Slovenia
Software Engineering Intern — June 2021 - Dec 2021
- ▷ Collaborated in smart assistant development for oil refineries.
- ▷ Formatted and processed text data for further semantic classification using Transformers and NumPy frameworks.
- ▷ Explored methods used to optimize semantic classification for speech recognition.
- ▷ Learned NLP and ML fundamentals.

PROJECTS

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 that converts a critter program into an AST (abstract syntax tree) with context-free grammar.
- ▷ Build an interpreter for the critter language using the visitor design patter and a simulator that maintains and changes the state of the model.
- ▷ Build the game's GUI using JavaFX and tied the parser, interpreter, simulator, and the GUI into a functioning game using the MVC design patter.

TECHNICAL SKILLS

Languages: Python, Java, JavaScript, C/C++, LaTeX, Markdown
Developer Tools: NeoVim, Git, Figma, Jupyter Notebooks, VS Code
Libraries: PyTorch, Numpy, PyTorch, Three.js, JavaFX