Uli Raudales

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Education

Whitman College Walla Walla, WA
Bachelor of Arts in Computer Science, Mathematics, & Physics *Aug. 2021 – Dec. 2025*

Technical Skills

Languages: Python, C/C++, Objective-C, Julia, Lua, TypeScript
Frameworks: React, Node.js, Apple Metal, Apple Cocoa, OpenGL
Tools: Git, Jupyter, Perf, Apple Instruments, Mathematica, SageMath
Libraries: pandas, NumPy, Eigen, SciPy, Google Benchmark, Three.js

Experience

Undergraduate Research Assistant June 2024 – Present
Whitman College *Walla Walla, WA*

- **Closed Diagrams in Information Field Theory for Bayesian Inference** May 2024 – Present
  - Leading research on "closed diagrams" in IFT to refine Bayesian inference via improved partition function calculations
  - Developed high-performance Python code for non-Gaussian distributions, linear regression models, and Random Parameterized Fields
- **Numerical Methods for Solving Delay Differential Equations in C++** June 2024 – Aug. 2024
  - Enhanced a C++ library for solving delay differential equations by optimizing data structures and algorithms for efficient past-state retrieval
  - Used profiling tools (Perf) to optimize performance and benchmark results against leading libraries in various languages
- **Salmon Migration: Interactive Fluid Simulations** September 2023 – May 2024
  - Developed an interactive web application to teach children about salmon migration patterns across the Columbia River
  - Led the math and physics components of the simulation to ensure accuracy and educational value
  - Built a TypeScript-based Lattice Boltzmann fluid simulation with interactive obstacles and a controllable salmon model

Information Technology Intern May 2022 – Aug. 2022
Baker Boyer National Bank *Walla Walla, WA*

- Developed automation scripts to streamline software deployment processes using bat scripting
- Assisted in maintaining network infrastructure and providing technical support to staff, enhancing operational efficiency
- Managed inventory data and contributed to infrastructure documentation and auditing processes

Projects

CPlotLib | *C, OpenGL*

- Developed a simple 2D plotting library in C with C++ bindings for visualizing mathematical functions using OpenGL
- Implemented a custom shader pipeline for rendering lines and curves with anti-aliasing

Epoch123 | *Python, PySide6, PyQt, Pygame, SQLite*

- Built a desktop app for organizing and editing audio files with Pygame-based playback and a PySide6 GUI
- Designed a SQLite schema for audio metadata and file paths, enabling quick and efficient data retrieval

MetalLib | *C, Objective-C, Apple Metal*

- Developed a graphics library in C that wraps Apple Metal for creating 3D scenes on macOS with a custom windowing system
- Implemented a Camera, 3D objects and lighting, and a custom shader pipeline for rendering 3D scenes