

# Uli Raudales

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## EDUCATION

### Whitman College

*Bachelor of Arts in Computer Science, Mathematics, & Physics*

Walla Walla, WA

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
  - \* Conducting research to enhance Bayesian inference using "closed diagrams" in Information Field Theory (IFT) for more accurate partition function calculations.
  - \* Developed Python code for non-Gaussian distributions and linear regression models, with a focus on complex data sets and high-dimensional parameter spaces.
  - \* Contributing to the development of an open-source Python package implementing these methods.
- **Numerical Methods for Solving Delay Differential Equations in C++** June 2024 – Aug. 2024
  - \* Improved upon the design and implementation of a C++ library for solving delay differential equations (DDEs)
  - \* Worked on implementing data structures and algorithms for efficient storage and retrieval of past states in DDEs
  - \* Optimized performance using profiling tools (Perf) and benchmarked against top libraries in C/C++, Fortran, and Julia.

### Teaching Assistant / Computer Lab Aide

Sept. 2023 – Present

*Whitman College*

*Walla Walla, WA*

- TA for the Computer Science and Physics Departments
- Assist students with course material, lab assignments, and projects, providing 1-on-1 support during office hours
- Helped grade exams and assignments, ensuring consistent feedback
- Maintained the computer lab and addressed technical issues with systems and software

### 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

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

- Developed a lightweight 3D graphics library in C, wrapping the Apple Metal API for performance-oriented applications
- Built a custom windowing system using Apple Cocoa and Foundation frameworks, ensuring cross-platform functionality
- Optimized the library using Apple Instruments, leading to a 20% increase in rendering performance

### Hopf Fibration Visualization | TypeScript, Three.js, Vite

- Implemented a web-based visualization of the Hopf fibration, a 4D geometric structure, using Three.js
- Developed custom shaders and lighting effects to represent the fibration in 3D space