



# BENJAMIN MASTRIPOLITO

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Salt Lake City, UT 84105  
USA

## ► EDUCATION

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### University of Utah

University of Utah

Advisor: Dr. Cem Yuksel, 3.9 GPA

August 2024

### Bachelors of Science in Computer Science

New Mexico Institute of Mining and Technology (NMT)

3.79 GPA

May 2020

## ► WORK EXPERIENCE

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### Research Assistant

University of Utah

Fall 2023 - May 2024

- Research assistant under Dr. Cem Yuksel ([cem@cemyuksel.com](mailto:cem@cemyuksel.com)) working on polygon-agnostic 3D modeling research in OpenGL and C++

### Post-Baccalaureate Student

Los Alamos National Laboratory

June 2020 - July 2022

- Research on parallel interpolation algorithms for physical equation-of-state data under mentorship of Dr. Daniel Sheppard ([danielsheppard@lanl.gov](mailto:danielsheppard@lanl.gov))
- Developed Python plotting package for physical equation-of-state data

### Parallel Computing Summer Research Internship

Los Alamos National Laboratory

June 2019 - Aug 2019

- Worked as a student in the Parallel Computing Summer Research Internship at LANL researching performance analysis techniques on parallel algorithms, under mentorship of Dr. Rao Garimella ([rao@lanl.gov](mailto:rao@lanl.gov))

### Research Assistant

New Mexico Institute of Mining and Technology

Jan 2019

- Worked with Dr. Denis Cohen ([denis.cohen@gmail.com](mailto:denis.cohen@gmail.com)) in developing a parallel, unstructured-mesh-based program for simulation of landslides using C++ and OpenMP

## ► PUBLICATIONS

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### SIMD-Optimized Search Over Sorted Data

Los Alamos National Laboratory

November 2021

## ► PORTFOLIO

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### Petting Zoo

Ongoing

<https://github.com/TheFutureGadgetsLab/PettingZoo>

Machine learning environment with procedurally generated platformer levels. Supports training various types of neural networks with genetic algorithms.

### Petri

Ongoing

<https://github.com/TheFutureGadgetsLab/Petri>

High performance parallel particle simulator and renderer written in Rust with WebGPU backend.

### Cellarium

Ongoing

<https://github.com/benpm/cellarium>

WebGL cellular automata simulator which allows random generation of novel multi-state rules. Simulation is written in an optimized GLSL fragment shader, allowing for large simulations. Web app UI built with Vue.

### CUDA / OpenGL Raytracer

2020

<https://github.com/benpm/cuda-raytracer>

Created a parallel raytracing program using NVIDIA CUDA C++ and OpenGL. Supports refractive materials, diffuse lighting, antialiasing, and emissive materials.

### LD48 Recursive Puzzle Game

2021

<https://github.com/benpm/ldjam48>

Puzzle game where the level structure is manipulated through interactive objects, allowing for levels which contain themselves. Made in 72 hours for the 48th Ludum Dare game jam, where it won 2nd place in the Innovation category out of almost 4000 submissions.

## ► SKILLS

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### C / C++

Extensive experience working in the C and C++ programming languages in both academic and professional settings.

### Graphics APIs

Experience with creating complex applications OpenGL, WebGL, WebGPU, CUDA, DirectX 12. Working knowledge of Linear Algebra in the context of computer graphics.

### Interpersonal

Multiple years of experience working directly with students tutoring mathematics and computer science. Experience working in a professional context with a moderate sized team of software engineers.

### Machine Learning

Experience with machine learning techniques and frameworks such as PyTorch, TensorFlow, and Keras.

### Parallel Computing

Experience with parallel computing techniques and frameworks such as OpenMP, MPI, and CUDA on very large compute clusters at Los Alamos National Laboratory.