Benjamin Mastripolito

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Education

MS Computing (Graphics & Visualization Track) — Aug 2022 - July 2024
University of Utah — *3.9 GPA*

BS Computer Science — Aug 2016 - May 2020
New Mexico Institute of Mining and Technology (NMT) — *3.79 GPA*

Work Experience

Research Assistant @ *University of Utah* — Fall 2023 - May 2024
- Research assistant under Dr. Cem Yuksel (*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*)
- 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*)

Research Assistant @ *New Mexico Institute of Mining and Technology* — Jan 2019
- Worked with Dr. Denis Cohen (*denis.cohen@gmail.com*) in developing a parallel, unstructured-mesh-based program for simulation of landslides using C++ and OpenMP

Publications

SIMD-Optimized Search Over Sorted Data @ *Los Alamos National Laboratory* — November 2021

Portfolio

Petting Zoo @ *https://github.com/TheFutureGadgetsLab/PettingZoo* — Ongoing
Machine learning environment with procedurally generated platformer levels. Supports training various types of neural networks with genetic algorithms.

Petri @ *https://github.com/TheFutureGadgetsLab/Petri* — Ongoing
High performance parallel particle simulator and renderer written in Rust with WebGPU backend.

Cellarium @ *https://github.com/benpm/cellarium* — Ongoing
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 @ *https://github.com/benpm/cuda-raytracer* — 2020
Created a parallel raytracing program using NVIDIA CUDA C++ and OpenGL. Supports refractive materials, diffuse lighting, antialiasing, and emissive materials.

LD48 Recursive Puzzle Game @ *https://github.com/benpm/ldjam48* — 2021
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

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.