Kieran Balls-Barker

Recent graduate from UMN with a double major in math and physics. Experience with research in physics. I enjoy logical problem solving, and am seeking opportunities related to mathematics and programming.

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EDUCATION

University of Minnesota, Minneapolis, MN — BS

September 2018 - May 2021

Bachelor of Science in Math and Physics (double major)
Graduated with Distinction (Gpa:3.78)

Normandale Community College, Bloomington, MN

August 2016 - May 2018

Phi Theta Kappa Honor Society

EXPERIENCE

Fermilab — *Mu2e*

July 2019 - November 2020

Mu2e is a $270 million high energy physics experiment aimed at detecting muon to electron conversions to simplify our understanding of the standard model of physics. I assembled components of the detection apparatus designed to track electron trajectories within a very strong magnetic field in order to measure their energy and verify the potential muon to electron conversion events.

PROJECTS

Replicating Hardy's Test — *Quantum Physics Experiment*

Hardy's Test is a test that shows violations of Bell's inequalities, which are predictions of classical physics. While ultimately unsuccessful ourselves, my partner and I identified various problems with previous methodology that helped a later group show the predicted violation.

Car Paper — *Applications of Differential Geometry*

I wrote a paper modeling a car in parameter space and exploring the implications of various properties of the model on how a car can move.

Dots Game — *Software Version of a Pen and Paper Game*

I created a python version of a pen and paper game with a smooth interface and various levels of AI opponents.

LANGUAGES

Python
Javascript
Java
Verilog
Matlab
HTML/CSS
Visual Basic

SKILLS

Object oriented programming
Recursion
Modular Programming
Machine Level Architecture
Statistics and Probability

RELEVANT COURSEWORK

Quantum Mechanics
Analytical Mechanics
Electrodynamics and Waves
Algebra Sequence
Complex Analysis
Stochastic Processes

OTHER INTERESTS

Dungeons and Dragons
Taekwondo
Logic Puzzles