

Jacob Dennerlein

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EDUCATION

Ph.D. in Mathematics

University of Tennessee, Knoxville (*May 2023*)

Advisor: *Dr. Luís Finotti*

Dissertation: *Computational Aspects of Mixed Characteristic Witt Vectors and Denominators in Canonical Liftings of Elliptic Curves*

B.S. in Computer Science & Mathematics

Murray State University (*May 2017*)

Thesis: *Finiteness of Posets Generated by 2x2 Integer Matrices*

RELEVANT WORK

Programming Consultant

Dr. Nina Fefferman (University of Tennessee)

Jun 2021 - May 2022

Developed a C++ library with R bindings for fast computation with simplicial sets (objects that generalize graphs), including the development and optimization of an algorithm to randomly generate large simplicial sets with specific properties.

Graduate Teaching Associate

University of Tennessee, Knoxville

Aug 2017 - present

Taught eighteen 100-level math classes, including calculus and statistics. Serviced the department in many other ways, most notably helping to optimize class scheduling and staff data organization.

HONORS & AWARDS

Academic Achievement Award

University of Tennessee, Knoxville (*2023*)

Math GTA Teaching Excellence Fellowship

University of Tennessee, Knoxville (*2021*)

Eaves Graduate Student Teaching Award

University of Tennessee, Knoxville (*2021*)

Outstanding Senior in Mathematics

Murray State University (*2017*)

PROJECTS

Witt Vectors

Python/SageMath (*ongoing*)

Implemented Witt vector objects and optimized their operations using original research from myself and Dr. Finotti. This project was done in parallel with my dissertation and was crucial to some of the discoveries within.

Perler Bead Sorter

Python, C

Prototyped a machine to sort Perler beads using OpenCV on a Raspberry Pi and an Arduino Uno as a microcontroller for the servos.

Personal Budgeting Software

PHP, Javascript, HTML, SQL

Built a webpage on my personal webserver to use for envelope-style budgeting. Automatically sets money aside each paycheck and interacts with an iPhone automation to seamlessly add card transactions.

Advent of Code (Programming Challenge)

Python

Solved all 100 problems on adventofcode.com in 2021 and 2022 using a variety of algorithms. Wrote up some thoughts in 2022 at github.com/nielrenned/aoc2022.

SKILLS

Technologies

Expert: Python, SageMath, L^AT_EX

Proficient: C, C++, Java, Git

Familiar: OpenCV, R, Javascript, PHP, SQL, Lua

Patterns & Practices

Active Debugging, Object-Oriented Programming, Functional Programming, Algorithm Design

Personal Aspects

Intelligent Problem Solver, Quick Learner, Strong Oral Communicator, Hard Worker, Team Player