Zane Blood

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Personal Website: zanebloodev.com

Experience ----------

Full-stack Software Engineer at Epic Systems | Verona, Wisconsin | August 2023 - Present

I work with an extensive healthcare database written in the M programming language and accessed through UNIX text on a daily basis. On the frontend, the client facing software is written in modern web languages like C#, TypeScript, and React. Facilitating communication between the client, server, and database is how we bring in our database healthcare records to display to physicians.

Undergraduate Research Assistant | Jared Maxson Group | Aug 2021 - May 2023

Designed, fabricated, and installed diagnostics and hardware for an ultra-fast electron diffraction accelerator. Learned and applied ultra high vacuum practices and procedures. Inventor / CAD, linux, General Particle Tracer, and Circuit Python software were commonly used..

Undergraduate Research Assistant | Jukka Vayrynen Group | May 2021 - Aug 2021

Created analytical and numerical models of the non-reciprocity of critical current in 1-D and quasi-1-D quantum wires using Mathematica and the Kwant python package. Theoretical predictions were compared to simulation to gain better insight into the systems studied. The abstract was presented at the March 2022 meeting of the APS. See this link to view the abstract yourself.

Math and Science Tutor | Ashland High School | Aug 2017 - May 2019

Provided free tutoring in any of the math or science classes that the school offered. Tutored both large groups and individual students one-on-one.

Projects ----------

I have made a few personal projects that combined what I learned in my physics education with computer programming. Here is a list with a short description and video link for each project:

Animation of the Time - Dependent Schrodinger Equation in 1 and 2 dimensions: Two simulations done in python which show how a 1-D wave packet scatters when hitting a potential barrier and how a 2 - D Gaussian pulse creates a quantum billiards system that evolves through time.

3-Body Problem: A python file that lets a user input the number of bodies, their initial positions and velocities, and then evolves the system in time. Each body's path history is drawn out using a dotted line.

Visualizing Sorting Algorithms: A graphical user interface written in Java that allows users to shuffle an array and then select different sorting algorithms to organize the array based on length in real time.

Visualizing Searching Algorithms: Another GUI written in Java where the user can generate random maps with obstacles and a start and target node. Different searching algorithms are then animated in real time to show the program searching for the target node.

Skills ----------

- Scientific Programming Languages: MATLAB, Python, Pandas, Circuit Python, R
- Front-end Programming Languages: JavaScript, React, HTML, CSS
- Back-end Programming Languages: Bash, UNIX/LINUX, Java, C#, MUMPS
- Trained in designing hardware with Inventor
- Ultra High Vacuum experimental practices
- Data taking, storage, and analysis

Education ----------

- Cornell University | 2020-2023 | Physics B.A.
- University of Arizona | 2019-2020 | Physics Major
- Ashland High School | 2015-2019 | High School Diploma