Zane Blood

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Skills & Abilities

· Object Oriented Programming, Algorithms, Java, JavaScript

· Data Analysis, Statistics, Python, Pandas

· Networks, LINUX, Terminal, Run Control, Run on Startup, SSH, Remote Login, Virtual Environment

· Hardware interfacing, Raspberry Pi, MATLAB, Circuit Python, PID and Feedback Loops

· Simulation, Computational Physics, Monte Carlo, Mathematica, General Particle Tracer, Kwant

Projects

VISUALIZING SORTING ALGORITHMS

Java code written in Processing which displays an interactive GUI and lets the user select different buttons to visualize different sorting algorithms like quicksort, mergesort, etc. See this video for a demonstration.

VISUALIZING SEARCHING ALGORITHMS

Another GUI written in Java that visualizes different searching algorithms like DFS or BFS. A new map can be randomly generated where the white block is the start point and the red block is the target. Obstacles are black and unvisited tiles are dark purple. See this video.

FAST FOURIER TRANSFORM & THE WAVE EQUATION

A simulation written in Python of two waves interacting with each other and diffusing over time using SciPy's built-in fft2 and ifft2 along with matplotlib. Watch the simulation here.

3 - BODY PROBLEM USING AUTOMATIC STEP SIZE RUNGE-KUTTA

Another simulation written in Python showing the stability of a configuration where the Earth has a second additional moon. View this link.

Experience

RESEARCH ASSISTANT | JARED MAXSON GROUP | AUG 2021 - PRESENT

Developed software for components along the beamline of the group's particle accelerator. Raspberry Pi, Circuit Python, LINUX, Inventor, and PID / feedback loops were used extensively.

RESEARCH ASSISTANT | PURDUE REU | MAY 2021 - AUG 2021

Created analytical and numerical models of the non-reciprocity of critical current in 1-D quantum wires using Mathematica and the Kwant Python package. For the abstract see this link:

Education

B.A. | 2020-2023 | CORNELL UNIVERSITY

· Physics major, Society of Physics Students, Dean's List, GPA 3.86