Jeffrey Ray

Software Engineer

CONTACT

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ON, Canada

LinkedIn

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EDUCATION

Bachelor of Computing

University of Guelph

2020-2024

Computer Science

Mathematics (minor)

SKILLS

Languages

Python

SQL

C, C++

JS, CSS, HTML5

LaTeX, Markdown

Project Management

Git

Jupyter

Excel

MySQL, PostgreSQL

PROJECTS

Please see my live portfolio to preview my projects and see more!

U.S. Presidents Dataset — May, 2025

Engineered a Python module to scrape, clean and maintain U.S. presidential data, supporting both on-demand refreshes and yearly-stable CSV datasets.

Analyzed inaugural ages using Welch's t-test to reveal post-WWII partisan age trends; visualized results with pandas and Seaborn.

Produced Jupyter notebooks showcasing EDA, statistical reasoning, and historical insights through hypothesis testing.

Boids — February, 2025

Created a decentralized flocking simulation in JavaScript with real-time tuning of physics for each unique flock of boids.

Added anchor-based following, swarming, and a toggleable collision system to explore emergent behaviors.

Mandelbrot Set Explorer — January, 2025

Deployed a JavaScript web app to explore fractals over the complex plane using data-parallel rendering with Web Workers for highly-performant visuals.

Showcased low-level optimization skills and ability to identify and address performance bottlenecks in compute-heavy applications.

Duel-Life — January, 2025

Readapted my browser-based *Conway's Game of Life* to build a stochastic cellular automaton simulating war between two factions with evolving frontlines over rocky terrain.

Integrated probabilistic state-transitions and dynamically-colored cells to animate strategic behaviors and depict weak (and strong) camp positions.

Python Libraries

Pandas

Matplotlib

Seaborn

Pillow (PIL fork)

Scipy

Knowledge

Combinatorics

Set Theory

Graph Theory

Linear Algebra

Calculus

Genetic Algorithm Package — December, 2024

Formulated a series of interactive Jupyter notebooks solving original genetic algorithm challenges, culminating in a reusable *Pyvolver* GA library.

Developed a flexible framework for applying GAs to any optimization, combinatorial or permutation problem.

Deployed a web-based visualizer with real-time evolution control (e.g., mutation, fitness scoring) to demonstrate *exploration vs exploitation* trade-offs.

Image Processing Toolbox — Spring, 2023

Built a modular REPL-based image editing suite supporting custom convolution kernels, histogram equalization, pixel-intensity visualizations, pointwise transformations and non-linear filtering.

Engineered original, psychedelic effects including channel-splitting distortions and glitch-art pixel sorting.

Online Chatroom & File Sharing Server— Spring, 2021

Architected a multi-user chat with sockets, multithreading, and a custom message protocol with headers and user authentication.

Built a color-coded, terminal-based UI on top of the *ncurses* library.

Designed a command-parsing system to support concurrent server-client operations, including serialized file transfer.

Graphic Maze Generator — Winter, 2020

Implemented a randomized DFS algorithm to build unique mazes.

Designed a responsive GUI with *Pygame*, which permits panning, scrolling, zooming, in-game play, and exporting mazes for printing.

Enhanced UX with custom menus for viewing keybindings and personalizing color themes, maze dimensions, and borders.

CERTIFICATES

Statistics with Python Specialization – University of Michigan

Statistics for Data Science Essentials – University of Pennsylvania

SQL for Data Science – University of California, Davis

PASSIONS

Music Composition | Guitar | Weight-Lifting | Health

Creative Writing | Comedy | Math & Logic puzzles