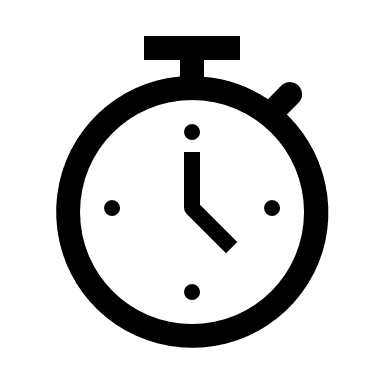
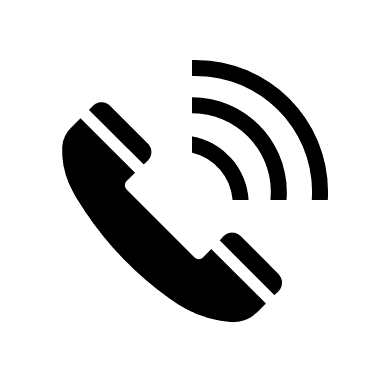
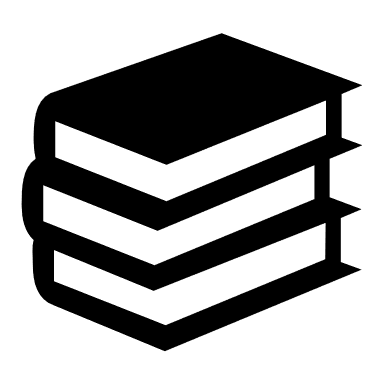
Jeffrey Ray



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.

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.

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.

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.

Please see my [live portfolio](https://jray-8.github.io/portfolio/) to preview my projects and see more!

Languages

Python

SQL

C, C++

JS, CSS, HTML5

LaTeX, Markdown

Project Management

Git

Jupyter

Excel

MySQL, PostgreSQL

**SKILLS**

**EDUCATION**

Bachelor of Computing

University of Guelph

2020-2024

Computer Science Mathematics (minor)

jeffrey.ray@bell.net

(647) 221-1703

ON, Canada

[LinkedIn](https://www.linkedin.com/in/jeffrey-ray-29271b30a/)

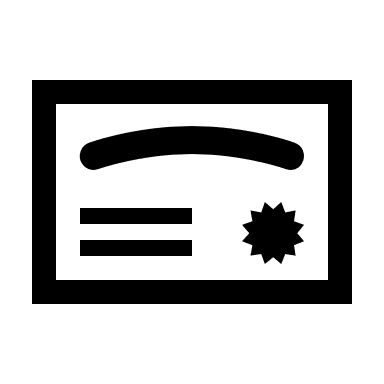
[GitHub](https://github.com/jray-8)



Software Engineer

**CONTACT**

**PROJECTS**



Python Libraries

Pandas

Matplotlib

Seaborn

Pillow (PIL fork)

Scipy

Knowledge

Combinatorics

Set Theory

Graph Theory

Linear Algebra

Calculus

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.

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.

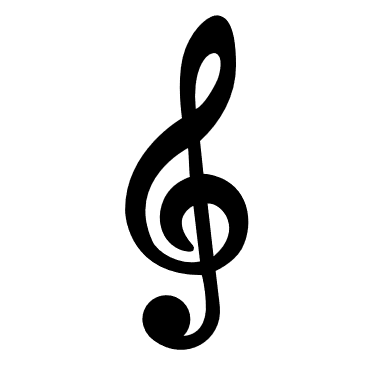
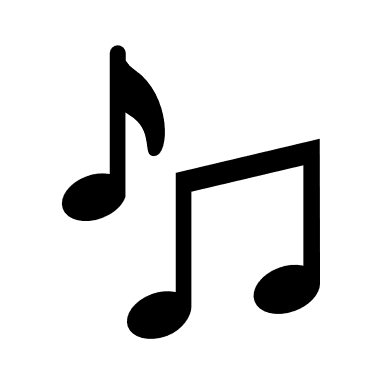
**CERTIFICATES**

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