

# Jonathon B. Ferrell

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## Summary

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- Professional Software Developer enthused by working in early start up environments or bringing antiquated code back to life.
- Strong experience as a solo developer and working on large highly diverse teams with experts and non-experts alike.
- Strong domain knowledge in multiple areas of STEM leads to unique insights and thinking from similar experienced developers.

## Professional Experience

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### Software Development

*2024-Present*

#### Contractor for Clarity CashFlow

**Created a web based tool to expedite business analysis based off needs of client.**

- Utilizing Intuit Quickbooks API, I developed a simple web hosted program to grab sales data from companies and stored them in a Postgres Database. The website then exposed REST APIs for further data integration.
- The program used Flask as a backend with Polars used to handle interim data processing and custom PowerQuery scripts to pull the data from the exposed REST APIs to Excel.
- I also utilized AWS, specifically EC2, to host a Docker image which ran the program.

### Software Development

*2023-Present*

#### Contractor for Fresh Technology LLC

**Saved company from catastrophic software failure due to a 3rd Party Deprecation.**

- Initial work required learning an unfamiliar programming language (Scala) and becoming familiar with the existing code base as no documentation existed. As well as updating build dependencies as no one could successfully build the application (including previous employees now contractors).
- I then decided a shim layer which took v2 API calls and translated them to v1 API calls was the best solution for the time requirements with a rewrite necessary for longer term stability.
- Initial shim layer was mostly completed in 3 Months (the required deadline) with minor tweaks over the next few months.
- I started the rewrite after the shim layer was stable and within a few months testing was already going on in live stores where edge cases were investigated and fixed. I chose to write in NodeJS for easy maintainability and availability of JS developers compared to Scala.

### Neural Network/Machine Learning Engineer

*2017-2023*

#### Graduate Research Assistant at University of Vermont

**Generated data, created models, and trained a machine learning project while consulting on others, and developing a new team of modelers.**

- I created a physics informed neural network which could predict the energy and forces on biomolecules to be used in tandem with simulation software to understand how they function.
- I consulted on a variety of projects, most notably I was a liaison between a multi team project utilizing biologists, chemists, and computer scientists in the pursuit of a generative Neural Network to combat antibiotic immune bacteria.

- I also lead a modernization project in the lab, bringing GPGPU computing as well as training members in machine learning models and statistics necessary to use them in order to prepare our lab for the current computational chemistry environment.

## Languages and Frameworks/Libraries

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|--------------|--------------|----------|
| • Python     | • Javascript | • Elixir |
| – Flask      | – NodeJS     | • Go     |
| – Tensorflow | – React      | • Bash   |
| – Numba      | – Typescript | • CUDA   |
| – Polars     |              |          |
| – Numpy      | • Scala      |          |

## Known Technologies and Skills

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| • git      | • Firebird          | • Linux                |
| • AWS      | • Amber Suite       | • Neural Networks      |
| • Postgres | • Schrödinger Suite | • Statistical Modeling |

## Education

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**Ph.D. Cellular, Molecular and Biomedical Sciences; University of Vermont; Burlington; VT**  
2023

Dissertation: “Biochemical Combinatorics Through Coarse Grain Neural Network Potentials, DNA Nanocages, & Virtual Reality”

Selected Courses: Combinatorial Graph Theory; Random Graph Theory; Proteins I: Structure & Function

**B.S. Physics/Biology; University of Tennessee Knoxville; Knoxville, TN** 2017

Selected Courses: Unconventional Computation; Structure of Matter;

## Awards

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|--|------|
| • Outstanding Young Researcher Award<br>From Computational Biophysics to Systems Biology | 2018 |
| • Outstanding Graduate - Physics<br>University of Tennessee, Knoxville                   | 2017 |
| • Consulate-General Award<br>Tennessee Area Japanese Speech Contest                      | 2016 |

## Hobbies

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- Music both listening, I have the most eclectic tastes, and playing (mainly piano though I am woefully out of practice).
- Cooking, everything to do with it, I have even baked a wedding cake.
- Photography, mostly nature and architecture photography though I am trying to get better at photos of people.
- Traveling, pre-pandemic I was trying to travel outside the country once a year, I love exploring new places and trying new things.