

## Education

---

Bachelor of Arts, *Applied Mathematics*

Bachelor of Arts, *Physics*

California State University, Sacramento | Sacramento, CA | May 2021

### Relevant Coursework

Classical Mechanics, Optics, Thermodynamics, Electronics and Instrumentation, Advanced Physics Laboratory, Biology I, General Chemistry I & II, Ordinary Differential Equations, Mathematical Methods, Real Analysis, Complex Analysis, Abstract Algebra, Programming Methods, Probability and Statistics, Statistical Computing, Big Data

### Laboratory Skills

Chemistry: practiced titration, spectroscopy, reflux, distillation, and acid-base interactions. Electronics: built linear and non-linear circuits, used sensors and transducers, built operational amplifiers, learned basic digital circuitry, and introduced to computerized data acquisition. Optics: studied geometrical optics, single and double slit interference and diffraction, polarization, error analysis, and used Michelson interferometers, He-Ne lasers, and photomultipliers.

### Projects

*Final Project – STAT 196K Big Data*

May 2021

- Statistical analysis of simulated data from the ATLAS particle physics experiment made available through CERN Open Source. With over 10 GB of zip CSV data, each file its own collision event, wanted to study the decay of Z bosons to positrons. The objective was to determine a relationship between displacement/location in the collider and the energy of the subatomic particle using K-means clustering. Used AWS as my cloud platform and Julia programming.

*Topological Flips – Senior Project*

Summer 2020 – May 2021

- Studied Lie Groups to describe skateboard stunts as algebraic structures. Our group produced a theorem to describe skateboard tricks from four fundamental stunts/elements in  $SO(3)$ .
- Used SymPy to create a catalog of stunts using symbolic matrices. Then created Python software to allow users to view rotational matrix or render a GIF of a stunt.

## Technical Profile

---

- Programming proficiency with Python (Spyder), R (RStudio), and Julia (Juno). Capable with Java (BlueJ), C++, and SQL. Software literacy include Wolfram Mathematica,  $\text{\LaTeX}$ , Bash (Unix shell), Git version control, HTML, XML, Markdown, MS Office Suite. Studied principles of OOP by building, iterating, validating, and troubleshooting/debugging algorithms and models. Also versed in functional programming.
- Experience with statistical modeling, principles, techniques, and applications complemented by knowledge of major statistical software. For given data, implemented distributional tests, unsupervised learning methods such as K-means for clustering or principal components analysis (PCA), or supervised learning such as linear regression or generalized additive models (GAMs).
- Knowledge of big data analytics via training in cloud computing. Created S3 buckets, configured AWS Cloudformation using a JSON template, and run query in Amazon Athena using standard SQL. Used a publicly available COVID-19 data lake. Also used AMI and EC2 instances from AWS to manipulate large data sets for exploratory data analysis.
- Extensive use of libraries such as Plots and Plotly in Julia, Matplotlib and Plotly in Python, and ggplot2 in R for data visualization and plotting. Built dashboards using Shiny in RStudio.
- Practiced reservoir sampling, pipeline implementation, and natural language processing. Worked with dense and sparse data structures and learned dimensional reduction. Optimized memory efficiency by monitoring performance, identifying bottlenecks, and utilizing parallel processing or multiprocessing when necessary.
- Technical writing and public speaking skills as well as a high level of interpersonal skills. Languages: Spanish (Read/Speak)

## Employment History

---

Monterey Bay Aquarium Gift and Bookstore - Monterey, CA

Sales, Stock, & Warehouse Associate

May 2012 – June 2018