Aaron Deich

Physicist & Data Scientist

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San Francisco, CA

- With a background in physics and scientific computation, I have broad experience in applying computational and statistical techniques to describe patterns within data, and in creating models to explain and predict these patterns. I am highly effective in learning how systems work and gaining insight into their behavior.
- Additionally, with my significant industry software engineering and computer science experience, I am proficient at writing readable, robust, code, in collaboration with software teams. I have strong familiarity with both object-oriented and functional programming paradigms.
- I have recently been a physics and calculus high school teacher. Ready to begin applying the math and analytical tools I was teaching towards original, creative projects, I have switched to data science full time.

Data Science and Software Experience

Lick Observatory
2018-2019

I ranked causes of unexpectedly high starlight measurement error for an $8M robotic planet-hunting telescope, describing correlation and dependency across dozens of telescope sensor channels (temperature, windspeed, etc). I combined millions of records across mismatched SQL telemetry databases and used Jupyter Python notebooks to perform regression and PCA analysis to look for causal relationships. Through frequent discussion with the telescope engineers, my insights were instrumental in guiding where to focus improvement efforts, and the observatory has since reduced the telescope's error to theoretical minimum levels. Github project

Independent Python Developer
2013-2014

I developed DNA sequence string pattern-matching Python objects for use by a cancer research lab. My scripts allowed the lab's scientists to search for arbitrary sets of DNA strings from a high-level API.

Markit
2012-2013

To support Markit's growth of serving several new financial institutions per month, I built and maintained dozens of custom ETL pipelines for ingesting and storing financial data from remote servers. I wrote Python for high-frequency file transfer and transformation; SQL scripts to maintain error-free behavior in our production environment; and logic to manage robust performance across our three local, redundant, company data centers.

Technical Language Skills and Expertise

- Python— `numpy, scipy, matplotlib, pandas, scikit-learn`
- SQL, C, Bash, LaTeX, Mathematica
- Statistics: Hypothesis testing, bayesian analysis, regressions, A/B testing, Monte Carlo simulation.
- Mathematics: multivariate calculus, numerical integration, differential Eqn solving , analytical modeling, linear algebra
- Algorithms: Dimensionality reduction (PCA), fourier analysis, clustering and classification ML.

Education

San Jose State University
2018

MA in Physics; focus on scientific computation and data analysis techniques spanning linear algebra, signal processing, machine learning, numerical integration, etc.
Masters Thesis: I made a study looking at why people don't read physics textbooks for fun; how textbooks today are fundamentally bad at teaching people to be good at creative, original understanding; and I looked at what we can learn from the books that we do read for pleasure.

Reed College
2011

BA in Physics; focus on computer science and computational physics.
Thesis: I simulated the orbital effect of supernovae on orbital systems using a Monte Carlo simulation.

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Teaching Experience

Jewish Community High School of the Bay
2018-2019

AP Physics and AP Calculus Teacher; Taught 51 students for the year.

Pacific Collegiate School
2016-2017

Physics Teacher Taught 55 students; I developed all of my own material for teaching AP Physics and Conceptual Physics.

San Jose State University
2014-2018

Teaching Assistant

- Taught calculus-based Mechanics (Physics 50)
- Physics for non-science majors (2A)
- Physics of Music. Co-taught and designed lessons.