Erik Sanders Cheng
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Skills

- Python (numpy, scipy, ipynb, pandas, matplotlib)
- R (rsqlite, jsonlite, ggplot2)
- Familiarity with SQL, XML, Scheme, HTML5/CSS3
- git/git bash/Github
- Fluent in English and Chinese (spoken)
- Statistics (Regression, hypothesis testing, Bayesian inference, Markov models)
- ML/validation (KNN, Naïve Bayes, decision trees, cross validation, permutation testing)
- Autodesk Inventor, soldering, milling

Projects and Publications

Surprising Effects of Hydrochloric Acid on the Water Evaporation Coefficient Observed by Raman Thermometry

Journal of Physical Chemistry C — February 2017

- Rizzuto, A. M., Cheng, E. S., Lam, R. K., Saykally, R. J. *J. Phys. Chem. C* (2017) - In Press.

2016 Election Case Study — Nov 2016- Dec 2016

- Created a report on improved classification models with regards to the 2016 election, using historical data pulled from various file formats. Used ggplot2 and MDS for visual exploratory data analysis.
- Implemented KNN and decision tree models to achieve highly improved prediction rates of 88 and 90% with reprioritized factors; created visualizations to identify geographic areas of high and low accuracy.

Monte Carlo Simulation of Ad Hoc Networks — October 2016

- In R, used Monte Carlo methods to study node distances as a function of node count and density. Results visualized and presented with ggplot2.

Anodization as a Low Cost, Scalable, and Tunable Nanoscale Manufacturing Technique

Rio Grande Symposium for Advanced Materials — October 2016

- Produced and presented a poster detailing the process of streamlining anodization, as well as large improvements in analysis of the products. A summary of work done for Sandia National Labs.

Education

UC Berkeley, Berkeley, CA — August 2014-Present

Chemistry BS, GPA 3.4

- Relevant coursework: Probability for Data Science, Advanced Linear Algebra, Directed Study for Undergraduates in Statistics, Structure and Interpretation of Computer Programs, Data Structures, Foundations of Data Science, Concepts in Computing with Data, Probability and Mathematical Statistics in Data Science
- Other coursework: Graduate Quantum Mechanics, Organic Chemistry, Inorganic Chemistry, Calculus

Experience

Course Staff

Data 8, UC Berkeley — January 2015-Present

- Lead classroom-style tutoring sessions for small groups of Data 8 students. Prepare lectures and create unique content (ipython notebooks with questions and code challenges) for these groups.
- Select and clean large data sets from online sources for use as material in instructional materials.
- Worked under Professor John Denero to enhance visualization functionalities in datascience, a custom written software package developed specifically at UC Berkeley for the teaching of this course. Also used Sphinx to improve documentation. Deployed for use by over 700 students.
- Assist in creating course content; enhance and validate questions, debugging and testing coding questions in Jupyter notebooks.
- Grade assignments and answer student questions in office hours, labs, and through an online class forum.

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Research Assistant May 2015- Present

Saykally Group, UC Berkeley, Berkeley, CA

- Maintain and operate a Raman laser spectroscopy setup, vacuum chamber, liquid pump and microjet ensemble for studying evaporation behavior of aqueous solutions.
- Responsible for maintaining and operating a Raman spectroscopy setup (utilizing Class IV Ar+ laser); maximize signal to noise by daily adjustments of optics elements, as well as noting proper droplet formation in vacuum chamber by photodiode observation.
- Determine quality of data by observation of Raman spectrum features. Designed a mask for CCD fiber optic to cut background interference by around 90%.

Research and Development Intern June 2016- Aug 2016

Sandia National Labs, Org 1728, Albuquerque, NM

- Used electrical analysis and optical microscopy techniques to engineer a reliable process for quantifying results of aluminum anodization and etching process. Reduced uncertainty by a factor of ~10.
- Worked on implementing a semi-automated workflow using Python to interface with equipment
- Created millimeter to centimeter scale metal structures, studying effects of varying factors in electrodeposition process. Clearly presented results of each variation in Powerpoint with an original template.

Electronics Assistant June 2013 to August 2013

University of Northern Iowa, Physics Department, Cedar Falls, IA

- Analyzed synthetic crystals based on elemental properties and physical features using SEM and EDX techniques.
- Tested and debugged code for Arduino units, constructed and wired go karts for use in a physics summer camp.

External Vice President and Instructor August 2015-Present

Rubik's Cube Club at Berkeley

- Organize and instruct Math 98, a course on solutions of Rubik's cubes. Lead two small groups of students in weekly sessions; one focused on a basic solution, and the other on an advanced, faster solution.
- Co-organized multiple officially sanctioned competitions, each drawing >200 guests. Manage staff during events; enforce systems ensuring timeliness and efficiency, regulate foot traffic, and monitor morale.
- Ensure a positive relationship with the community by prompt replies to inquiries via Facebook and email.