

Zoë Koch

Passionate about taking dirty real-world data all the way with the right tools for the job. Well versed in analytical methods ranging from traditional statistics to the newest machine learning techniques, executed with maintainable code, to boot. I have an interdisciplinary research background and believe in using data to tell a story.

Projects

- Developed a Mask R-CNN model for classifying types of microbes in pictures of urine cultures, identifying where colonies are at the pixel level. Used common machine learning tools like TensorFlow, Microsoft Azure, and scikit-learn.
- Used Word2Vec and statistical methods including decision trees, naive Bayes classification, SVM, and logistic regression to predict a measure of political bias in American politicians' tweets.
- Compared ingredients in American and Korean skincare products, scraped from drugstore websites and put into an ingredient search engine, to construct a bipartite graph of ingredient types and frequencies. Used to create a visualization of ingredients and to compare cultural approaches to skincare.

Experience

2016-08 - **University of Vermont, Burlington, VT**

2017-12 *Graduate Teaching Assistant*

- Taught Calculus 1 to classes of 25-35 students, including all lecturing, lesson planning, quiz/exam writing, and grading.
- Passionate about engaging and encouraging students, particularly those from underrepresented groups.

2016-02 - **Goldman Sachs, Salt Lake City, UT**

2016-07 *Private Wealth Management Analyst*

- Team lead of developing an application to automate background checks on clients. Ultimately performed checks on 300,000 parties and saved approximately 15,000 hours of labor and remediation processes while minimizing the risk of human error.
- Developed an automated system for uploading files into an internal database, saving \$350,000-\$400,000 annually in scanning fees.
- Updated internal work order website currently in use by hundreds of Goldman Sachs employees.

2015-05 -

2015-09 **Zions Bancorporation, Salt Lake City, UT**

Quantitative Analyst Intern

- Developed and applied stochastic models to analyze potential bank loan losses and ensure compliance with Dodd-Frank Act regulations.
- Performed modeling, data analysis, and programming in SQL, R, SAS and Excel.
- Reported key loan loss indicators and stress test results for supervisors and federal regulators.
- Worked closely with teammates from technical and nontechnical backgrounds.

Personal Info

Phone

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E-mail

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Website

zoekoch.github.io

Github

github.com/ZoeKoch

LinkedIn

www.linkedin.com/in/zoe-koch-76431063/

Education

2016-08 - 2018-05

**Masters of Science,
Applied Mathematics**

University of Vermont

2011-07 - 2015-05

**Bachelor of Science,
Mathematics: Statistics
Emphasis**

University of Utah

Courses

Deep Learning

Reinforcement Learning

Statistical Learning

Modeling Complex
Systems

Statistical Inference
Sequence

Numerical Analysis

Chaos, Fractals & Dynamical
Systems

Stochastics Sequence

- 2015-01 - 2015-03

eBay, South Jordan, UT

Statistical Intern

 - Performed time series analysis on large datasets of electrical capacity measurements in order to efficiently allocate power resources to eBay's servers throughout daily and yearly fluctuations.
 - Presented work and recommendations in reports to supervisors.
- 2014-08 - 2014-12

University of Utah, Salt Lake City, UT

Research Assistant

 - Researched and modeled electrical breakdown boundaries of composite materials.
 - Presented findings at the SIAM Conference on Computational Science & Engineering in Spring 2015.
- 2013-06 - 2013-08

Eastern Tennessee State University, Johnson City, TN

National Science Foundation, Undergraduate Researcher

 - Researched probabilistic methods applied to combinatorics problems.
 - Authored the Journal of Mathematics and System Science, presented findings at the 2014 Joint Mathematics Meetings in Baltimore.
- 2012-06 - 2012-08

University of Oklahoma, Norman, OK

National Science Foundation, Undergraduate Researcher

 - Collected and analyzed giant flat gold nanoparticle data using Asylum AFM computer programs.
 - Modeled molecular interactions in crystal structures.
- 2012 - 2013

Organization of Women in Science, University of Utah

Vice President

 - Acquired funding, doubled active membership through campus recruitment.
 - Helped foster an inviting environment for aspiring women in STEM.

Publications

Patrick Bardsley, Jonathan Boyle, Nathan Briggs, Zoë Koch, Michael S. Primrose, Michael Zhao and Graeme W. Milton, Criteria for guaranteed breakdown in two-phase inhomogeneous bodies, Inverse Problems, Volume 33, Number 8, 27 June 2017. <http://iopscience.iop.org/article/10.1088/1361-6420/aa76c5/meta>

Zoë Koch, Ruyue (Julia) Yuan, and Anant Godbole, Covering array bounds using analytical techniques, Congressus Numerantium, Vol. 222, pp. 65—73

Anant Godbole, Zachary Higgins, and Zoë Koch, Multiple finite representability of integers as h-sums. Proceedings of the Integers Conference 2016

Skills

Python

R

MATLAB

SQL

Java

SAS

Interests

Former ski instructor at Deer Valley in Park City, UT and Stowe in Stowe, VT

Proud mother of two beautiful cats