

# Kevin Miller

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## EDUCATION

### UNIVERSITY OF CALIFORNIA, LOS ANGELES

PHD MATHEMATICS

Jun 2022 | Los Angeles, CA

**Advisor:** Dr. Andrea L. Bertozzi

**Research Focus:** Active Learning in Graph-Based Semi-Supervised Learning

**Cum. GPA:** 3.92 / 4.0

**Awards:**

- DoD NDSEG Research Fellowship (Fall 2019-Spring 2022)
- NSF NRT Graduate Research Fellowship (Fall 2018-Spring 2019)

### BRIGHAM YOUNG UNIVERSITY, PROVO

BS IN APPLIED AND COMPUTATIONAL  
MATHEMATICS

Apr 2017 | Provo, UT

**Cum. GPA:** 3.96 / 4.0

**Awards:** Magna Cum Laude, 4-year  
Full-Tuition Academic Scholarship

## COURSEWORK

### GRADUATE

Mathematical Machine Learning  
Statistical Machine Learning

Optimization for Large-Scale Systems

Math. Aspects of Scientific Computing

Stochastic Processes

Monte Carlo Methods for Optimization

Numerical Analysis

Calculus of Variations

Applied Differential Equations

### UNDERGRADUATE

Computation & Optimization (1,2)

Modeling with Uncertainty & Data (1,2)

Data Structures (C++)

Numerical Methods for Linear Algebra

## PROGRAMMING SKILLS

### Most Experience:

Python • Numpy • SKLearn

### Significant Experience:

Pandas • MATLAB • PyTorch • L<sup>A</sup>T<sub>E</sub>X

### Familiar With:

SQL • MLFlow • C++

## RESEARCH EXPERIENCE

### UCLA MATHEMATICS | GRADUATE RESEARCH FELLOW

Aug 2018 - Present | Los Angeles, CA

- Independently developed novel active learning acquisition function to efficiently leverage similarity graph structure and labeling information in Bayesian statistical framework [1,3]
- Application focus on human-in-the-loop ground-truth labeling for hyperspectral imagery and body-worn video datasets

### UCLA REUCAM | GRADUATE STUDENT RESEARCHER

(*Research Experience for Undergrads in Computational and Applied Math*)

Summer 2018 | Los Angeles, CA

- Conducted research in template matching in large-scale multichannel networks under Dr. Andrea Bertozzi for DARPA applications
- Adapted GraphSAGE node embedding to fit application-specific need
- Group's method significantly outperformed other academic groups' methods on desired task

Summer 2016 | Los Angeles, CA

- Developed novel method for semi-supervised classification of pixels in hyperspectral images under Dr.'s Andrea Bertozzi and Stanley Osher
- Optimized group's MATLAB code with substantial speed ups
- Published results in IEEE ICASSP 2017 [3]

### BYU MATHEMATICS | UNDERGRADUATE RESEARCHER

Sep 2015 – Jun 2017 | Provo, UT

- Applied random forests in deep learning framework and explored probabilistic perspective of link prediction with Dr. Jeffrey Humphreys
- Led undergraduate participation and presentation of research topics

### LAWRENCE LIVERMORE NATIONAL LABORATORIES |

COMPUTATIONAL SCIENCE INTERN

May 2015 – Aug 2015 | Livermore, CA

- Designed and performed testing in Python of traditional clustering algorithms for identifying directed cyclic community structures
- Wrote technical report summarizing results and presented in Student Intern Poster Symposium July 28, 2015

## PUBLICATIONS & PREPRINTS

- [1] K. Miller and A. Bertozzi. Model change active learning in graph-based semi-supervised learning, 2021. (In progress, to submit to SIMODS).
- [2] A. L. Bertozzi, B. Hosseini, H. Li, K. Miller, and A. M. Stuart. Posterior consistency of semi-supervised regression on graphs, 2020. Submitted to Inverse Problems.
- [3] K. Miller, H. Li, and A. L. Bertozzi. Efficient graph-based active learning with probit likelihood via gaussian approximations, 2020. ICML Workshop on Real World Experiment Design and Active Learning 2020.
- [4] V. Chayes, K. Miller, R. Bhalerao, J. Luo, W. Zhu, A. L. Bertozzi, W. Liao, and S. Osher. Pre-processing and classification of hyperspectral imagery via selective inpainting. In 2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pages 6195–6199, 2017.