

# Matthew J. Heiner

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Vitae updated: October 21, 2020

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## EDUCATION

### University of California, Santa Cruz, Santa Cruz, CA

Ph.D., Statistical Science August 2019

Thesis: Bayesian Mixture Modeling and Order Selection for Markovian Time Series  
Committee: Athanasios Kottas (chair), Stephan Munch, Raquel Prado, and Abel Rodríguez

### Brigham Young University, Provo, UT

M.S., Statistics April 2014

Project: An Absorbing Markov Chain Model for Skill Importance in Women's Soccer  
Committee: Gilbert Fellingham (chair), David Dahl, and Candace Berrett

B.S., Statistics: Actuarial Science Emphasis April 2014

Minor in Mathematics  
*magna cum laude*

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## EXPERIENCE

**Assistant Professor**, *Brigham Young University* Aug. 2019 – Present

**Graduate Pedagogy Mentor**, *UC, Santa Cruz* June – Aug. 2018

**Online Course Developer/Instructor**, *UC, Santa Cruz* March 2016 – April 2017

**Student Intern**, *Lawrence Livermore National Laboratory* June – Aug. 2015, 2016

**Statistician Intern**, *Savvysherpa Inc.* May – Sept. 2014

**R Programmer/Intern**, *Acxiom Corporation* Dec. 2012 – Nov. 2013

**Actuarial Intern**, *Aon Hewitt* May – Aug. 2011

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## PUBLICATIONS

### PEER-REVIEWED PUBLICATIONS

3. **Heiner, M.**, Kottas, A., and Munch, S. (2019), “Structured priors for sparse probability vectors with application to model selection in Markov chains,” *Statistics and Computing*, 29, 1077-1093. [link](#)
2. Lamas, L., Santana, F., **Heiner, M.**, Ugrinowitsch, C., and Fellingham, G. (2015), “Modeling the Offensive-Defensive Interaction and Resulting Outcomes in Basketball,” *PloS one*, 10, e0144435. [link](#)
1. **Heiner, M.**, Fellingham, G. W., and Thomas, C. (2014), “Skill importance in women's soccer,” *Journal of Quantitative Analysis in Sports*, 10, 287–302. [link](#)

## UNDER REVIEW

2. **Heiner, M.** and Kottas, A. (2020+), “Estimation and selection for high-order Markov chains with Bayesian mixture transition distribution models,” *arXiv preprint arXiv:1906.10781*.
1. **Heiner, M.** and Kottas, A. (2020+), “Autoregressive Density Modeling with the Gaussian Process Mixture Transition Distribution,” *arXiv preprint arXiv:2007.09279*. [link](#)

## IN PREPARATION

3. **Heiner, M.** and Kottas, A. (2020+), “Bayesian Nonparametric Density Autoregression with Lag Selection,” *arXiv preprint arXiv:2003.09759*. [link](#)
2. **Heiner, M.**, Smith, H., Leavitt, S., Grimm, T., Christensen, W., Carling, G. (2020+), “Pollution Source Apportionment with Lichens as Biomonitors.”
1. Heaton, M., White, P., **Heiner, M.**, Abbott, B., (2020+), “Model-based Clustering of Trends and Cycles of Nitrate Concentrations in Rivers Across France.”

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## PRESENTATIONS

- “Estimation and Selection for High-order Markov chains with Mixture Transition Distribution Models”
  - BYU/USU Applied Math Seminar, virtual, November 2020.
  - NBER-NSF SBIES Conference, virtual, August 2020.
- “Bayesian Nonparametric Density Autoregression with Lag Selection”
  - 13th International Conference of the ERCIM WG on Computational and Methodological Statistics, virtual, December 2020.
  - Joint Statistical Meetings, virtual, August 2020.
  - Statistics Department Seminar, Brigham Young University, Provo, UT, September 2019.
- “Bayesian Model Selection for Markov Chains Using Sparse Probability Vectors.”
  - Joint Statistical Meetings, Vancouver, BC, Canada, July 2018.
  - Chapter Meeting, San Francisco Chapter of the American Statistical Association, San Francisco, CA, June 2018.
  - Poster at the Graduate Research Symposium, University of California, Santa Cruz, Santa Cruz, CA, April 2018.
- “The Interaction of Arctic Sea Ice and Global temperature, and Their Bias in Climate Simulation Experiments.”
  - Engineering Summer Intern Seminar, Lawrence Livermore National Laboratory, Livermore, CA, August 2016.
- “Characterizing Natural Climate Variability of Mean Global Temperature in CMIP-5 Models.”
  - Applied Statistics Group Seminar, Lawrence Livermore National Laboratory, Livermore, CA, September 2015.
- “Skill Importance in Women’s Soccer.”
  - Student Research Conference, Brigham Young University, Provo, UT, March 2013.
- “Bayesian Analysis of Diet Intervention in Young Adults.”
  - Student Research Conference, Brigham Young University, Provo, UT, March 2012.

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## RECOGNITIONS

JSM Student Travel Award, San Francisco Chapter of the American Statistical Association (3rd place), May 2018.

Chancellor’s Fellowship, Applied Mathematics and Statistics, UC Santa Cruz, 2014 – 2015.

Brigham Young Scholarship, 2006–2007, 2010 – 2013.

Section Award, Student Research Conference, Brigham Young University, March 2013.

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## TEACHING EXPERIENCE

### **Instructor**, *Brigham Young University*

Stat 201 – Statistics for Engineers and Scientists

Winter 2020

Stat 240 – Probability and Inference 1

Fall 2019

### **Online Course Developer/Instructor**, *UC, Santa Cruz*

March 2016 – April 2017

*Coursera* – Bayesian Statistics: Techniques and Models

Rated 4.8/5 (249 ratings); 24,000+ cumulative enrollment as of December 2019.

*Coursera* – Bayesian Statistics: From Concept to Data Analysis (assistant to Herbert Lee)

Rated 4.6/5 (1,830 ratings); 77,000+ cumulative enrollment as of December 2019.

### **Graduate Student Instructor**, *UC, Santa Cruz*

AMS 7 – Statistical Methods for the Biological, Environmental, and Health Sciences

Summer 2017, Winter 2018, Summer 2018, Winter 2019

AMS 7L – Biostatistics Lab

Fall 2017, Fall 2018, Summer 2019

### **Teaching Assistant**, *UC, Santa Cruz*

AMS 131 – Introduction to Probability Theory

Fall 2015, Spring 2018

AMS 7 – Stat. Methods for the Bio., Env., and Health Sciences

Spring 2017

AMS 80A – Gambling and Gaming

Winter 2016

### **Teaching Assistant**, *Brigham Young University*

Stat 497R – Introduction to Research: Sports Analytics

Winter 2014

Stat 340 – Statistical Inference

Winter 2012

Stat 301 – Statistics and Probability for Secondary Educators

Summer 2012

Stat 240 – Discrete Probability

Winter 2012

Stat 230 – Analysis of Variance

Fall 2012

Stat 201 – Statistics for Engineers and Scientists

Summer 2012

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## STUDENT ADVISING

Year	Student	Role	Position Following Graduation
2021	Taylor Grimm	Undergrad. Research Mentor	
2021	Hayden Smith	Undergrad. Research (co-)Mentor	
2020	Brittany Russell	MS Committee Member	
2020	Matthew Drewes	MS Committee Member	

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## SERVICE

### PROFESSION

Secretary, Utah Chapter of the American Statistical Association

August 2020 – Present

Referee, *IMA Journal of Management Mathematics* (sp. issue on sports)

February 2020 – Present

### DEPARTMENT

Strategic Planning Committee for Online Courses, Member

September 2019 – Present

## STUDENT

President, Mu Sigma Rho, Utah BYU Chapter

2012 – 2013

Full-time Volunteer Representative for The Church of Jesus Christ of Latter-day Saints,  
Queens, NY

2007 – 2009

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## MEMBERSHIPS

International Society for Bayesian Analysis

2013 – Present

American Statistical Association  
- Section on Bayesian Statistical Science

2011 – Present

Mu Sigma Rho

2010 – 2014