

Matthew J. Heiner

Ph.D. Candidate
Department of Applied Mathematics and Statistics
University of California, Santa Cruz

email: mheiner@ucsc.edu
web: mheiner.github.io
phone: (801) 205-6687

EDUCATION

University of California, Santa Cruz, Santa Cruz, CA

Ph.D., Statistical Science

anticipated June 2019

Thesis: Mixture modeling methods for Bayesian inference of nonlinear dynamics

Advisors: Athanasios Kottas and Stephan Munch

Brigham Young University, Provo, UT

M.S., Statistics

April 2014

Project: An absorbing Markov chain model for skill importance in women's soccer

Advisor: Gilbert Fellingham

B.S., Statistics: Actuarial Science Emphasis

April 2014

Minor, Mathematics

magna cum laude

PAPERS and MANUSCRIPTS

IN PREPARATION

Heiner, M., Kottas, A., and Munch, S. (2018), "A Bayesian model for estimation and order selection in high order Markov chains," Tech. Rep. UCSC-SOE-18-07, Jack Baskin School of Engineering, University of California, Santa Cruz.

Heiner, M., Kottas, A., and Munch, S. (2018), "Structured priors for sparse probability vectors with application to model selection in Markov chains," Tech. Rep. UCSC-SOE-18-06, Jack Baskin School of Engineering, University of California, Santa Cruz. (Submitted to *Statistics and Computing*.)

PEER-REVIEWED PUBLICATIONS

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.

Heiner, M., Fellingham, G. W., and Thomas, C. (2014), "Skill importance in women's soccer," *Journal of Quantitative Analysis in Sports*, 10, 287–302.

TEACHING EXPERIENCE

Graduate Student Instructor, UC, Santa Cruz

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

Taught Summer 2017, Winter 2018, Summer 2018

AMS 7L – Biostatistics Lab

Taught Fall 2017, (Fall 2018)

Online Course Developer/Instructor, UC, Santa Cruz

March 2016 to April 2017

Coursera – Bayesian Statistics: Techniques and Models

Rated 4.8/5 (128 ratings); 9,000+ cumulative learners as of August 2018.

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

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

Jan. 2012 to April 2014

STAT 497R – Introduction to Research: Sports Analytics
STAT 340 – Statistical Inference
STAT 301 – Statistics and Probability for Secondary Educators
STAT 240 – Discrete Probability
STAT 230 – Analysis of Variance
STAT 224 – Statistical Computing 1
STAT 201 – Statistics for Engineers and Scientists

EXPERIENCE

Summer Graduate Pedagogy Mentor, UC, Santa Cruz

June to Aug. 2018

Peer mentor to six summer graduate student instructors.

Online Course Developer/Instructor, UC, Santa Cruz

March 2016 to April 2017

Built content and exercises for introductory Bayesian statistics course on Coursera (with Herbert Lee). Principal developer and instructor for a second course in the sequence, launched in April 2017.

Student Intern, Lawrence Livermore National Laboratory

June to Aug. 2015, 2016

Statistical modeling of surface temperature simulation data from an international ensemble of climate models to extract and characterize natural climate variability and seasonality.

Statistician Intern, Savvysherpa Inc.

May to Sept. 2014

Data visualization with Tableau, accelerometer data modeling with hidden Markov models, health care cost modeling, debit card transaction data mining.

Research Assistant, Brigham Young University

Skill Importance Modeling

June 2012 to April 2014

Developed Bayesian absorbing Markov chain models for evaluation of skill importance in men's basketball and women's soccer. Applied to space creation and space protection dynamics in basketball and to offensive skill sequences in soccer. Two publications.

Sports Analytics Group

Sept. 2012 to April 2014

Student database manager for consulting project with Brigham Young University athletics. Teaching assistant responsible for training students.

R Programmer/Intern, Axiom Corporation

Dec. 2012 to Nov. 2013

Natural language processing for social media sentiment analysis.

Actuarial Intern, Aon Hewitt

May to Aug. 2011

Assisted health and benefits consulting actuarial team. Worked with pricing and estimation models, updated reports with claims data, and assisted in development of model automation.

PRESENTATIONS

“Bayesian model selection for Markov chains using sparse probability vectors.” Joint Statistical Meetings, Vancouver, BC, Canada, July 2018.

“Bayesian model selection for Markov chains using sparse probability vectors.” Chapter Meeting, San Francisco Chapter of the American Statistical Association, San Francisco, CA, June 2018.

Poster: “Bayesian model selection for Markov chains using sparse probability vectors.” 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.

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.

SERVICE

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.

MEMBERSHIPS

International Society for Bayesian Analysis, 2013–Present.

American Statistical Association, 2011–Present.

Mu Sigma Rho, 2010–2014.