

Spencer Giddens
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EDUCATION

MS, Mathematics **August 2020**
Brigham Young University Provo, UT

- Advisor: Jared Whitehead, whitehead@mathematics.byu.edu
- GPA: 4.0/4.0

BS, Applied and Computational Mathematics **December 2018**
Brigham Young University Provo, UT

- Honors: *magna cum laude*
- GPA: 3.97/4.0

RESEARCH INTERESTS

- Optimization
- Inverse problems
- Markov chain Monte Carlo methods
- Error-control coding
- Bayesian inference
- Aeronautical telemetry
- Physical-layer security
- Cryptography and secure communications
- Scientific computing
- Machine learning (especially deep neural networks)
- Information theory
- Signal processing

RESEARCH EXPERIENCE

Graduate Researcher **January 2019-CURRENT**
Brigham Young University Provo, UT

- Optimize signal processing algorithm for aeronautical telemetry
- Develop software to be implemented by US Air Force

NSF IRES Student Researcher **April 2018-August 2018**
University of Coimbra Coimbra, Portugal

- Optimized communication scheme for physical-layer security
- Supported by NSF IRES award #1761280

Undergraduate Research Assistant **January 2017-December 2018**
Brigham Young University Provo, UT

- Used MCMC methods to reconstruct historical earthquakes

- Led groups of students in software development

TEACHING EXPERIENCE

Graduate Student Instructor: delivered lectures, held office hours, assigned grades

- Finite Mathematics (MATH 118) – Brigham Young University, Spring 2019
 - Teacher rating: 4.4/5 (Average for course: 3.9/5)

Teaching Assistant: held office hours/test reviews, instructed labs, graded assignments

- Introduction to Digital Communication Theory (EC EN 485) – Brigham Young University, Winter 2020
- Mathematical Analysis 1 (MATH 344) – Brigham Young University, Fall 2018
- Algorithm Design & Optimization 1 (MATH 320) – Brigham Young University, Fall 2018
- Mathematical Analysis 2 Lab (MATH 347) – Brigham Young University, Winter 2018
- Mathematical Analysis 1 Lab (MATH 345) – Brigham Young University, Fall 2017

Other Teaching Experience:

- ACME Development Team – Brigham Young University, August 2016-August 2017
 - Wrote curriculum for Applied and Computational Mathematics (ACME) lab courses
- GEAR UP – Provo City School District, August 2015-May 2016
 - Tutored high school students in math and helped them prepare for college

CONFERENCE PRESENTATIONS

1. **S. Giddens**, “Bayesian Reconstruction of Historical Earthquakes,” Mathematical Advances in Geophysics, SIAM Regional Conference, University of Wyoming, Laramie, WY, September 28, 2019
2. **S. Giddens**, “Optimization of the ICSHK Coding Scheme,” Mathematics Session, Student Research Conference, Brigham Young University, Provo, UT, March 23, 2019
3. **S. Giddens**, “Identifying the Source of an 1820 Earthquake and Tsunami South of Sulawesi, Indonesia through Geologic Data and Numerical Modeling,” Geology Session, Student Research Conference, Brigham Young University, Provo, UT, March 3, 2018
4. M. Morrise and **S. Giddens**, “Reconstruction of Historical Earthquake Events Using Markov Chain Monte Carlo Methods,” Mathematics Session, Student Research Conference, Brigham Young University, Provo, UT, March 3, 2018
5. **S. Giddens** and E. Dunn, “Mapping Tsunamis on Google Earth,” Mathematics Session, Student Research Conference, Brigham Young University, Provo, UT, March 4, 2017

PUBLICATIONS

Submitted:

1. J. Krometis, J. P. Whitehead, R. A. Harris, N. Glatt-Holtz, J. Fullwood, **S. Giddens**, M. H. Klein, C. Ashcraft, H. Ringer, M. Morrise, Y. Zhao, C. Kesler, A. Robertson, M.

Harward, "Methodological reconstruction of historical seismic events using modern statistical inversion techniques: a case study for the great 1852 Banda Arc mega-thrust earthquake and tsunami" (*Geophysical Research Letters*, 2019)

2. **S. Giddens**, M. A. C. Gomes, J. P. Vilela, W. K. Harrison, "Enumeration of the Degree Distribution Space for Finite Block Length LDPC Codes" (*IEEE International Symposium on Information Theory*, 2020)

AWARDS AND SCHOLARSHIPS

- *Dean's list*, Spring 2015, Fall 2015, Winter 2017, Fall 2017
- *Best Presentation Award – BYU Student Research Conference*, March 2018
- *Marriott Scholarship*, Fall 2012 (Southern Virginia University's most prestigious award)
- *Full tuition scholarship*, Spring/Summer 2016, Spring/Summer 2017
- *William Henry Thorpe scholarship*, Fall 2016, Winter 2017
- *Sally Sample Graves scholarship*, Fall 2017, Winter 2018
- *Wessel/Marshall Memorial scholarship*, Fall 2018

SERVICE AND EXTRACURRICULAR ACTIVITIES

- Full-time volunteer missionary service, Los Angeles, CA, February 2013-February 2015
- Intercollegiate soccer player, Southern Virginia University, Fall 2012
- Eagle Scout Award, May 2010

PROFESSIONAL MEMBERSHIPS

- American Mathematical Society (AMS)

LANGUAGES

English: Native Language

Spanish: Fluent – Advanced Level Proficiency Certificate from ACTFL

Portuguese: Limited Working Proficiency