

# Brian Zaharatos

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Teaching Professor & Director of the Professional Master's Degree in Applied Mathematics

Department of Applied Mathematics

University of Colorado

Boulder, CO 80309

## Education

### **Colorado School of Mines, Golden, CO**

*PhD, Applied Mathematics and Statistics, 2015*

*MS, Applied Mathematics and Statistics, 2013.*

- Thesis title: *Statistical Modeling of Photovoltaic Device Performance*. Advisors: Luis Tenorio and Paul Constantine

### **University of South Carolina, Columbia, SC**

*MA, Philosophy, 2012*

- PhD level pass of comprehensive exam on the history of philosophy, 2011.
- *Relevant Graduate Coursework*: Teaching Philosophy, Logic, and Probability Theory.

### **State University of New York, Stony Brook, NY**

*BS, Mathematics and Philosophy, 2007*

## Employment

### **University of Colorado at Boulder, Boulder, CO**

*Teaching Professor, Department of Applied Mathematics, Fall 2022-present*

*Senior Instructor, Department of Applied Mathematics, Fall 2019-present*

*Instructor, Department of Applied Mathematics, 2015-2019*

- Director of Professional MS in Applied Mathematics
- Director of Professional MS in Applied Mathematics
- Assumed a leadership role in developing a BA in Statistics and Data Science.
- Faculty advisor for the undergraduate chapter of the Society for Industrial and Applied Mathematics (SIAM).
- Multisection coordinator for Calculus 2 for Engineers and Matrix Methods.
- Developed several courses, including a first year seminar in interdisciplinary decision-making and a philosophy of statistics course.

### **Colorado School of Mines, Golden, CO**

*Graduate Teaching/Research Fellow, 2011-2015*

- Successfully fulfilled full instructor duties for four semesters of Calculus for Engineers and one semester of Nature and Human Values.
- 2014-2015 AMS Graduate Teaching Award.

### **Red Rocks Community College, Lakewood, CO**

*Part-time Instructor, January 2013-2015*

### **University of South Carolina, Columbia, SC**

*Graduate Instructor and Teaching Assistant, 2009-2011*

## Teaching Experience

- Hundreds of credit hours of post secondary teaching experience. Courses include:
  - **Statistical Modeling for Data Science Applications Specialization** (Coursera x Univ. Colo. Boulder)
  - **Computational Bayesian Statistics** (Univ. Colo. Boulder)
  - **Introduction to Mathematical Statistics** (Univ. Colo. Boulder)
  - **Choices, Choices! An Interdisciplinary Look at Decision Theory** (First Year Seminar, Univ. Colo. Boulder)
  - **Data Science** (in Comp. Sci. Department, Univ. Colo. Boulder)
  - **Statistical Methods and Applications I and II** (Univ. Colo. Boulder)
  - **Statistical Modeling** (undergraduate and graduate level, Univ. Colo. Boulder)
  - **Philosophical and Ethical Issues in Statistics** (Univ. Colo. Boulder)
  - **Matrix Methods** (Univ. Colo. Boulder)
  - **Calculus I & II for Engineers** (Colorado School of Mines, Univ. Colo. Boulder)
  - **Intro. to Statistics** (Red Rocks Community College)
  - **Research Ethics** (graduate level, Colorado School of Mines)
  - **Inductive Logic** (University of South Carolina; met liberal arts math requirement)
  - **Deductive Logic** (TA, University of South Carolina; met liberal arts math requirement)
  - **Intro. to Philosophy** (University of South Carolina)
  - **Ethics** (Red Rocks Community College)
  - **Environmental Ethics** (Red Rocks Community College)
  - **Nature and Human Values** (Colorado School of Mines)
- Experience with:
  - diverse student populations, including applied science and engineering students, and community college students.
  - evidence-based teaching methods, including active learning techniques, and partially flipped classes.
  - Asynchronous and synchronous online teaching, learning environments, including Coursera, Canvas, and WebAssign.
  - technology in the classroom (e.g., iPad notes, Jupyter Notebook demos).

## Publications

- **Zaharatos, B.** *The Philosophy of Statistics: An Introduction*. Forthcoming.
- Gardiner, G, **Zaharatos, B.** The Safe, the Sensitive, and the Severely Tested: A Unified Account. *Synthese*. 2022.
- **Zaharatos, B.**, Glawson, M. Trigger Warning: Disturbing Data Sets in the Classroom. *Significance*. Vol 15(2): 38 - 40. 2018.
- **Zaharatos, B.** Statistical Errors Are Often Not Due to Mathematical Errors [Letter to the Editor]. *Chronicle of Higher Education*. 2017.
- **Zaharatos, B.**, Campanelli, M. Tenorio, L. Estimability of the PV Single-Diode Model Parameters. *Statistical Analysis and Data Mining*. Vol 8(5-6): 329 - 339. 2015.
- Constantine, P., **Zaharatos, B.**, Campanelli M. Discovering an Active Subspace in a Single-Diode Solar Cell Model. *Statistical Analysis and Data Mining*. Vol 8(5-6): 264 - 273. 2015.
- Rolston, J., Huzyk, S., Packard, C., Mitcham, C., **Zaharatos, B.** Nanoethics and Policy Education: A Case Study of Social Science Coursework and Student Engagement with Emerging Technologies. *NanoEthics: Studies of New and Emerging Technologies*. Vol. 8(3): 217 - 225. 2014.
- **Zaharatos, B.** Daniel Kahneman. In *Ethics, Science, Technology, and Engineering*, Second Edition. Eds. Carl Mitcham, Britt Holbrook. Macmillan Reference. 2014.
- **Zaharatos, B.** Decision Theory. In *Ethics, Science, Technology, and Engineering*, Second Edition. Eds. Carl Mitcham, Britt Holbrook. Macmillan Reference. 532 - 535. 2014.
- **Zaharatos, B.** Misconduct in the Mathematical Sciences. In *Ethics, Science,*

*Technology, and Engineering*, Second Edition. Eds. Carl Mitcham, Britt Holbrook. Macmillan Reference. 132 - 133. 2014.

- **Zaharatos, B.** Peter Singer. In *Ethics, Science, Technology, and Engineering*, Second Edition. Eds. Carl Mitcham, Britt Holbrook. Macmillan Reference. 165 - 167. 2014.
- **Zaharatos, B.** Probability: Basic Concepts of Probability Theory. In *Ethics, Science, Technology, and Engineering*, Second Edition. Eds. Carl Mitcham, Britt Holbrook. Macmillan Reference. 469 - 477. 2014.
- **Zaharatos, B.** Statistics (a five part series). In *Ethics, Science, Technology, and Engineering*, Second Edition. Eds. Carl Mitcham, Britt Holbrook. Macmillan Reference. 2014.

## Invited Talks

- "Philosophical and Ethical Issues in Statistics: A Course for STEM Students." Summer Seminar in the Philosophy of Statistics. August 2, 2019.
- "How Interdisciplinary is Data Science? Computer Science, Statistics, and...*Philosophy*." Sponsored by the Colorado Data Science Team, University of Colorado Boulder. February 14, 2017.
- "Beyond the 'Intersection': A new Paradigm for the Integration of the Liberal Arts and STEM." Colorado School of Mines, April 2016.
- "Beyond Algorithms: Philosophy of Statistics in the Standard Curriculum." Sponsored by the Committee for the History and Philosophy of Science, University of Colorado Boulder, February 23, 2016.
- "Inverse Problems and Uncertainty Quantification: A Gentle Introduction." University of Colorado, Boulder, CO. April 2015.
- "Statistics and Rationality." Northern Arizona University, Flagstaff, AZ. April 2015.
- "Statistics as a Liberal Art." The Evergreen State College, Olympia, Washington. March 2015.
- "Social Movements and Rationality." The Evergreen State College, Olympia, Washington. March 2015.

## Conferences

- "Philosophical and Ethical Issues in Statistics." Roundtable Facilitator. Joint Statistical Meetings. 2018
- "Caveats on Data Cloning." Poster Presentation. Joint Statistical Meetings. 2018
- "Statistics as a Liberal Art." Joint Mathematics Meetings. 2016.
- "An Active Subspace Analysis of the Single-Diode Model." Oral presentation. SIAM Conference on Computational Science, March 14, 2015.
- "On Philosophical Beliefs in Science and Academia." Oral presentation. Society for Ethics Across the Curriculum. 2014.
- "Likelihood Methods for Single-Diode Model Parameter Estimation from Noisy I-V Curve Data." Oral presentation. Photovoltaics Specialists Conference. 2014 (**received best student paper award**).
- "On the Identifiability of the Single-Diode Model." Poster Presentation. Conference on Data Analysis. 2014 (**honorable mention, best student poster**).
- "Alternative Methods? Cost Benefit Analysis and the Precautionary Principle." Poster presentation. Sixth Annual Rocky Mountain Ethics Congress (RoME). 2013.
- "Kornblith, Dreyfus and Non-Representational Action." South Carolina Society for Philosophy Annual Conference. 2011 (**received graduate student paper award**).
- "Cultural Objects in Carnap's Aufbau: a Heideggerian Critique." South Carolina Society for Philosophy Annual Conference. 2010 (**received graduate student paper award**).

## Service

**Faculty Leadership Institute**, University of Colorado Boulder, Boulder, CO, Fall 2021-Spring 2022

**Director, Professional Master's Degree, Department of Applied Mathematics**, University of Colorado Boulder, Boulder, CO, Spring 2018-present

**Undergraduate Committee, Department of Applied Mathematics**, University of Colorado Boulder, Boulder, CO, Fall 2017-Spring 2018

**Statistics and Data Science Committee Member, Department of Applied Mathematics**, University of Colorado Boulder, Boulder, CO, Spring 2016-present

**Faculty Fellow, Arts and Sciences Support of Education Through Technology (ASSETT)**, University of Colorado Boulder, Boulder, CO, Spring 2017-Spring 2018

**Judge, Rocky Mountain Ethics Bowl**, Fall 2016

**Referee, Problems, Resources, and Issues in Mathematics Undergraduate Studies (PRIMUS)**, Summer 2016-present

**IT Committee Member, Department of Applied Mathematics**, University of Colorado Boulder, Boulder, CO, Spring 2016-Spring 2017.

**Committee for the History and Philosophy of Science Member**, University of Colorado Boulder, Boulder, CO, Spring 2016-2019

**Faculty Advisor, Undergraduate SIAM Chapter**, University of Colorado Boulder, Boulder, CO, Fall 2015 - Spring 2018

**AmeriCorps National Civilian Community Corps Member**, Denver, CO

- Over two-thousand service hours with non-profits/the US Forest Service in 2008.
- Received Presidential Volunteer Service Award and Bronze Congressional National Service Award.

**Nevada Conservation Corps Member**, Reno, NV, Summer 2009

- Over four-hundred service hours with nonprofits/US Forest Service.

## Awards and Grants

- Eric Vance (PI), Brian Zaharatos (co-PI), Derek Briggs (co-PI), and Jessica Alzen (co-PI). "Transformative Education and Training in Interdisciplinary Statistics and Data Science (TETRIS)". National Science Foundation's Innovations in Graduate Education (IGE) Program. July 2020 - June 2023. \$500,000.
- Arts and Science Support of Education through Technology (ASSETT) Faculty Fellows Program, 2017-2018.
- Colorado School of Mines AMS Graduate Teaching Award, 2014-2015
- Graduate Teaching Fellowship, Colorado School of Mines, 2012-2013, Spring 2015.
- National Center for Photovoltaics Graduate Student Fellowship, January 2014.
- Teaching Assistantship, University of South Carolina, 2009-2011.
- James W. Oliver Award for the Study of Logic, University of South Carolina.

## Consulting

### **Six Head Corp, Longmont, CO**

#### ***Statistics Consultant, 2020-2021***

- Provided statistical consulting and advising services for software products under development.

### **Bardwell Consulting/OptiMiser Energy, Denver, CO**

#### ***Statistics Consultant, 2012, April 2015-2016, October 2017***

- Independently researched and implemented statistical methods applied to energy analysis of commercial and residential buildings; contributed to statistical analyses used in litigation; worked efficiently and punctually from a home office.

### **EMS Development Corporation, Yaphank, NY**

#### ***Applied Mathematics Consultant, 2010-2011***

- Independently researched and implemented several mathematical models used in the calibration of a degaussing system. Improved company efficiency by developing algorithms that can be used remotely by field engineers.