

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

- Faculty Director of the Professional MS in Applied Mathematics
- Interim Faculty Director of the MS in Data Science
- Assumed a leadership role in developing BA and MS curricula 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

- Van Buskirk, I., Zaharatos, B., Clauset, A., Larremore, D., "If the data do not speak for themselves, how ought we to speak for the data?". D.A.R.E workshop at ICWSM 2023.
- "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

Interim Faculty Director, MS in Data Science, University of Colorado Boulder, Boulder, CO, Summer 2023-present

Steering Committee Member, MS in Data Science, University of Colorado Boulder, Boulder, CO, Spring 2021-Spring 2023

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

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

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

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

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.