

Cassidy K. Buhler, Ph.D.

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EMPLOYMENT

2024 – Present	Postdoctoral Fellow <i>University of Colorado, Boulder Environmental Data Science Innovation & Inclusion Lab (ESIIIL)</i>
2019 – 2024	Doctoral Research Fellow <i>Drexel University Decision Sciences & MIS Department</i>
2018 – 2021	Research Assistant <i>University of Utah Mathematics Department</i>
2018	Computer Science Intern <i>United States Air Force Hill Air Force Base</i>

EDUCATION

2024	Drexel University Ph.D. Operations Research Computational Data Science Minor <i>Thesis: Advances in Optimization with Applications to Biodiversity Conservation</i>	Philadelphia, PA
2019	University of Utah B.S. Mathematics Statistics Emphasis	Salt Lake City, UT

RESEARCH

JOURNAL ARTICLES

- C. K. Buhler, H. Y. Benson, and D. F. Shanno, “Regularized step directions in nonlinear conjugate gradient methods,” *Mathematical Programming Computation*, 2024, ISSN: 1867-2957. [DOI: 10.1007/s12532-024-00265-9](#).
- C. K. Buhler, R. S. Terry, K. G. Link, and F. R. Adler, “Do mechanisms matter? Comparing cancer treatment strategies across mathematical models and outcome objectives,” *Mathematical Biosciences and Engineering*, vol. 18, no. 5, pp. 6305–6327, 2021, ISSN: 1551-0018. [DOI: 10.3934/mbe.2021315](#).

CONFERENCE PROCEEDINGS

- C. K. Buhler and H. Y. Benson, “Decision-making for land conservation: A derivative-free optimization framework with nonlinear inputs,” in *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 38, 2024, pp. 21932–21939. [DOI: 10.1609/aaai.v38i20.30195](#).
- C. K. Buhler and H. Y. Benson, “Optimal land conservation decisions for multiple species,” in *Proceedings of the 52nd Northeast Decision Science Institute Annual Conference*, vol. 52, Washington, D.C., 2023, pp. 808–816.

PREPRINTS

- C. K. Buhler and H. Y. Benson, “Efficient solution of portfolio optimization problems via dimension reduction and sparsification,” *arXiv preprint arXiv:2306.12639*, [DOI: 10.48550/arXiv.2306.12639](#).

IN PROGRESS

- C. K. Buhler and H. Y. Benson, “Regularized nonlinear conjugate gradient methods for machine learning,” Working paper.

TEACHING

2019 – **Instructor**

2024 *Drexel University | Decision Sciences & MIS Department*

Course	Level	Quarter(s)	Tool(s)
BSAN 360: Programming for Data Analytics	U	Winter 2022	R
Ph.D. Programming Bootcamp	PhD	Summer 2021; Summer 2022	Python
MIS 200: Management Information Systems (Recitation Section)	U	Fall 2019; Fall 2020; Winter 2021	MS Access; Excel; HTML

**Undergraduate (U)*

2019 – **Teaching Assistant**

2024 *Drexel University | Decision Sciences & MIS Department*

Course	Level	Quarter(s)	Tool
BSAN 360: Programming for Data Analytics	U	Spring 2021	R
BSAN 601: Business Analytics for Managers	MS; MBA	Spring 2024	Excel
MIS 612: Aligning IS & Business Strategies	EMBA; MBA	Fall 2023	-
MIS 625: Management of IT Operations	MBA	Fall 2023	-
OPM 200: Operations Management	U	Spring 2020; Fall 2021; Spring 2023	Excel
OPM 341: Supply Chain Management	U	Spring 2021; Spring 2022; Fall 2022	Excel
OPM 344: Revenue Management	U	Fall 2022	Excel
OPR 320: Linear Models for Decision Making	U	Summer 2020; Spring 2021	Excel
STAT 201: Intro to Business Statistics	U	Winter 2020; Spring 2020; Fall 2021; Summer 2022; Spring 2023; Winter 2024	Excel
STAT 202: Business Statistics II	U	Summer 2021; Spring 2023	Excel
STAT 205: Statistical Inference I	U	Spring 2020; Fall 2021	Excel
STAT 206: Statistical Inference II	U	Summer 2021	Excel
STAT 510: Intro to Statistics for Business Analytics	MBA	Summer 2023; Winter 2024	Excel
STAT 642: Data Mining for Business Analytics	MS; PhD	Winter 2023	R


**Undergraduate (U)*

2018 – **Computer Lab Assistant & Mathematics Tutor**

2019 *University of Utah | T. Benny Rushing Mathematics Student Center*

SOFTWARE


Conmin-CG: Hybrid Cubic Regularization of Conjugate Gradient Methods


 <https://github.com/cassiebuhler/ConminCG>

 C, MATLAB, Python.

 10.5281/zenodo.13315592

Derivative-Free Optimization for Land Conservation

 <https://github.com/cassiebuhler/conservation-dfo>

 10.5281/zenodo.13742960

PRESENTATIONS

2024	AAAI Conference on Artificial Intelligence (AAAI-24) Poster: Decision-making for land conservation: A derivative-free optimization framework with nonlinear inputs.	Vancouver, BC, Canada.
2023	MIT Sloan Rising Scholars Conference Talk: Decision-making for land conservation: A derivative-free optimization framework with nonlinear inputs.	Cambridge, MA (Virtual)
2023	INFORMS Annual Meeting Talk: Decision-making for land conservation: A derivative-free optimization framework with nonlinear inputs.	Phoenix, AZ.
2023	SIAM Conference on Optimization (OP23) Talk: Reserve design in biodiversity conservation.	Seattle, WA.
2023	NEDSI Annual Conference Talk: Optimal land conservation decisions for multiple species.	Washington, D.C.
2021	INFORMS Annual Meeting Talk: Regularized step directions in conjugate gradient minimization for machine learning.	Anaheim, CA. (Virtual)
2021	SIAM Conference on Optimization (OP21) Talk: Conjugate gradient methods for machine learning.	Virtual.
2020	INFORMS Annual Meeting Talk: Efficient solution of portfolio optimization problems via dimension reduction & sparsification.	Virtual.

SERVICE

2023	Session Chair Session: Nonlinear Optimization in Machine Learning.	INFORMS Annual Meeting
2023	Session Organizer Session: Nonlinear Optimization and Applications.	SIAM Conference on Optimization
2023	Session Chair Session: Land, Sand, and Plastic Management.	NEDSI Annual Conference
2022	Panelist Session: Teaching Assistance Orientation Session.	Drexel University
2019	Mathematics Tutor - Volunteer Tutored students who are incarcerated in a Salt Lake Community College math course.	Utah Prison Education Project

AWARDS & GRANTS

2023	Rising Scholar MIT Sloan School of Management
2023	Graduate Student Travel Subsidy Award Drexel University
2023	DEI & Environment and Sustainability Innovation Micro-Grant Drexel University

AWARDS & GRANTS (CONTINUED)

2023	Teck-Kah Lim Graduate Student Travel Subsidy Award <i>Drexel University</i>
2023	Student Travel Award <i>Society for Industrial and Applied Mathematics (SIAM)</i>
2022	Teaching Assistant Excellence Award <i>Drexel University</i>
2021	Teaching Assistant Excellence Award (Highly Commended) <i>Drexel University</i>
2021	Student Travel Award <i>Society for Industrial and Applied Mathematics (SIAM)</i>
2019	Undergraduate Research Scholar Designation <i>University of Utah</i>
2019	Research Experience for Undergraduates (REU) <i>University of Utah</i>

SKILLS

PROGRAMMING

Language *Libraries/Packages/Toolboxes*

PYTHON PyTorch | TensorFlow | Pandas | BeautifulSoup | scikit-learn | Keras | Seaborn

R tidyverse | ggplot | rgdal | SDMTools | deSolve

MATLAB Deep Learning | Statistics & Machine Learning | Optimization | Financial | Computer Vision

OPTIMIZATION SOFTWARE

Software *Applications*

GUROBI Quadratic Programming | Linear Programming

Pyomo Mixed-Integer Nonlinear Programming | Derivative-Free Optimization

CVX Convex Optimization

CPLEX Integer Programming | Linear Programming

AMPL Nonlinear Programming

ORGANIZATIONS

AAAI: Association for the Advancement of Artificial Intelligence

AGU: American Geophysical Union

AWM: Association for Women in Mathematics

ESA: Ecological Society of America

INFORMS: The Institute for Operations Research and the Management Sciences

SIAM: Society for Industrial and Applied Mathematics