





Cassidy K. Buhler, Ph.D.

 cassie.buhler@colorado.edu  [cassie-buhler](https://www.linkedin.com/in/cassie-buhler)  [cassiebuhler.github.io/](https://github.com/cassiebuhler)  [cassiebuhler](https://twitter.com/cassiebuhler)

EMPLOYMENT


2024 – Present	Postdoctoral Associate <i>Environmental Data Science Innovation & Inclusion Lab (ESIIL)</i> <i>University of Colorado, Boulder</i>	Boulder, CO
2019 – 2024	Doctoral Research/Teaching Fellow <i>Decision Sciences & MIS Department</i> <i>Drexel University</i>	Philadelphia, PA
2018 – 2021	Research Assistant <i>Mathematics Department</i> <i>University of Utah</i>	Salt Lake City, UT
2018	Computer Scientist Intern <i>Hill Air Force Base</i> <i>United States Air Force</i>	Hill AFB, UT

EDUCATION


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


PAPERS

C. K. Buhler, H. Y. Benson, and D. F. Shanno, “Regularized step directions in nonlinear conjugate gradient methods,” *Mathematical Programming Computation*, vol. 16, pp. 629–664, 2024, ISSN: 1867-2957.  DOI: [10.1007/s12532-024-00265-9](https://doi.org/10.1007/s12532-024-00265-9).

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. 21 932–21 939.  DOI: [10.1609/aaai.v38i20.30195](https://doi.org/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.

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](https://doi.org/10.48550/arXiv.2306.12639).

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](https://doi.org/10.3934/mbe.2021315).

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

TEACHING

2019 – **Instructor** Philadelphia, PA
2024 *Decision Sciences & MIS Department*
Drexel University

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** Philadelphia, PA
2024 *Decision Sciences & MIS Department*
Drexel University

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)

TEACHING (CONTINUED)

2018 –	Mathematics & Computer Lab Assistant	Salt Lake City, UT
2019	<i>T. Benny Rushing Mathematics Student Center University of Utah</i>	

PRESENTATIONS

2024	AGU Annual Meeting (AGU24) Poster: Exploring innovation in biodiversity conservation decision-making through open science and generative AI	Washington, DC.
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.

AWARDS & GRANTS

2023	Rising Scholar <i>MIT Sloan School of Management</i>
2023	Graduate Student Travel Subsidy Award <i>Drexel University</i>
2023	DEI & Environment and Sustainability Innovation Micro-Grant <i>Drexel University</i>
2023	Teck-Kah Lim Graduate Student Travel Subsidy Award <i>Drexel University</i>

AWARDS & GRANTS (CONTINUED)

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>

SERVICE

2023	Session Chair Session: Nonlinear Optimization in Machine Learning.	<i>INFORMS Annual Meeting</i>
2023	Session Organizer Session: Nonlinear Optimization and Applications.	<i>SIAM Conference on Optimization</i>
2023	Session Chair Session: Land, Sand, and Plastic Management.	<i>NEDSI Annual Conference</i>
2022	Panelist Session: Teaching Assistance Orientation Session.	<i>Drexel University</i>
2019	Mathematics Tutor (Volunteer) <ul style="list-style-type: none">• Provided weekly tutoring sessions at the Utah State Prison.• Supported students who are incarcerated and taking a Salt Lake Community College math course.	<i>Utah Prison Education Project</i>

SKILLS

PROGRAMMING

Language *Libraries/Packages/Toolboxes*

Python PyTorch | TensorFlow | Pandas | scikit-learn | Keras | Seaborn | Ibis | DuckDB

R tidyverse | ggplot | 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