




# Cassidy K. Buhler, Ph.D.

 cassidy.buhler@gmail.com

 cassie-buhler

 cassiebuhler.github.io/

 cassiebuhler

## EMPLOYMENT

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Starting 09/2024	<b>Postdoctoral Associate</b> <i>University of Colorado, Boulder   Environmental Data Science Innovation &amp; Inclusion Lab (ESIIIL)</i>
2019 – 2024	<b>Doctoral Research Fellow</b> <i>Drexel University   Decision Sciences &amp; MIS Department</i>
2018 – 2021	<b>Research Assistant</b> <i>University of Utah   Mathematics Department</i>
2018	<b>Computer Scientist (Intern)</b> <i>United States Air Force   Hill Air Force Base</i>

## EDUCATION

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

## PUBLICATIONS


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### JOURNAL ARTICLES

C. K. Buhler, H. Y. Benson, and D. F. Shanno, “Regularized step directions in nonlinear conjugate gradient methods,” *arXiv preprint arXiv:2110.06308*, 2024, To appear in *Mathematical Programming Computation*.


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.

### REFEREED 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.

### WORKING PAPERS

C. K. Buhler and H. Y. Benson, “Efficient solution of portfolio optimization problems via dimension reduction and sparsification,” *arXiv preprint arXiv:2306.12639*, Working paper.  DOI: 10.48550/arXiv.2306.12639.

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	Skills
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	Skills
BSAN 360: Programming for Data Analytics	U	Spring 2021	R
BSAN 601: Business Analytics for Managers	MS; MBA	Spring 2024	Excel
MIS 612: Aligning Information Systems & Business Strategies	EMBA; MBA	Fall 2023	-
MIS 625: Management of Information Technology Operations	MBA	Fall 2023	-
OPM 200: Operations Management	U	Spring 2020; Fall 2021; Spring 2023	-
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

### Derivative-Free Optimization for Land Conservation

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

</> R, Python, RAMAS.

### Conmin-CG: Hybrid Cubic Regularization of Conjugate Gradient Methods

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

</> C, MATLAB, and Python.

## SKILLS

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### PROGRAMMING

*Language   Libraries/Packages/Toolboxes*

**Python**   PyTorch | TensorFlow | Pandas | BeautifulSoup | scikit-learn | Keras | Seaborn | ee

**R**   tidyverse | ggplot | rgdal | raster | rgeos | 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

## PRESENTATIONS

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

## AWARDS & GRANTS

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2023	<b>Rising Scholar</b> MIT Sloan School of Management
2023	<b>Graduate Student Travel Subsidy Award</b> Drexel University

## AWARDS & GRANTS (CONTINUED)

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2023	<b>DEI &amp; Environment and Sustainability Innovation Micro-Grant</b> <i>Drexel University</i>
2023	<b>Teck-Kah Lim Graduate Student Travel Subsidy Award</b> <i>Drexel University</i>
2023	<b>Student Travel Award</b> <i>Society for Industrial and Applied Mathematics (SIAM)</i>
2022	<b>Teaching Assistant Excellence Award</b> <i>Drexel University</i>
2021	<b>Teaching Assistant Excellence Award (Highly Commended)</b> <i>Drexel University</i>
2021	<b>Student Travel Award</b> <i>Society for Industrial and Applied Mathematics (SIAM)</i>
2019	<b>Undergraduate Research Scholar</b> <i>University of Utah</i>
2019	<b>Research Experience for Undergraduates (REU)</b> <i>University of Utah</i>

## SERVICE

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

## ORGANIZATIONS

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**AAAI:** Association for the Advancement of Artificial Intelligence

**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