




Cassidy K. Buhler, Ph.D.

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EDUCATION


- 2024 **Drexel University** Philadelphia, PA
Ph.D. Operations & Business Analytics
Computational Data Science Minor
Thesis: Advances in Optimization with Applications to Biodiversity Conservation
- 2019 **University of Utah** Salt Lake City, UT
B.S. Mathematics
Statistics Emphasis

EMPLOYMENT


- 2019 – **Doctoral Research Fellow**
2024 *Drexel University | Decision Sciences & MIS Department*
- 2018 – **Research Assistant**
2021 *University of Utah | Mathematics Department*
- 2018 **Computer Scientist (Intern)**
United States Air Force | Hill Air Force Base

PUBLICATIONS

JOURNAL ARTICLES


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.

UNDER REVIEW

C. K. Buhler, H. Y. Benson, and D. F. Shanno, “Regularized step directions in nonlinear conjugate gradient methods,” *arXiv preprint arXiv:2110.06308*, 2021, Under 2nd round of review at Mathematical Programming Computation.  DOI: 10.48550/arXiv.2110.06308.

IN PROGRESS

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

PROGRAMMING

Language Libraries/Packages/Toolboxes

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

R tidyverse | ggplot | rgdal | raster | rgeos | SDMTTools | 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

- | | | |
|------|---|-------------------------|
| 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

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|------|---|
| 2023 | Rising Scholar
MIT Sloan School of Management |
| 2023 | Graduate Student Travel Subsidy Award
Drexel University |

AWARDS & GRANTS (CONTINUED)

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>
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 <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 Tutored students who are incarcerated in a Salt Lake Community College math course.	<i>Utah Prison Education Project</i>

ORGANIZATIONS

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