

# Robert Lewis Bassett

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## Appointments and Research Experience

2018-Present	Assistant Professor of Operations Research. Naval Postgraduate School.
2017, 2018	Research Mathematician. Institute for Defense Analyses.
2016	Systems Analyst. Sandia National Laboratories.
2015	Research Mathematician. National Security Agency.
2013-18	Graduate Research Associate. University of California Davis.

## Education

Ph.D. Mathematics	University of California Davis. 2018. <i>Dissertation:</i> Stochastic and Convex Optimization in Statistical Estimation. Advised by Roger J-B Wets.
M.A. Mathematics	University of California Davis. 2015
B.S. Mathematics	California State University Bakersfield. 2013. <i>Magna Cum Laude</i>

## Publications & Presentations

### *Publications & Technical Reports*

1. Robert L Bassett and Peter Barkley. Optimal design of resolvent splitting algorithms. *arXiv preprint arXiv:2407.16159*, 2024
2. Veeranjanyulu Sadhanala, Robert Bassett, James Sharpnack, and Daniel J McDonald. Exponential family trend filtering on lattices. *Electronic Journal of Statistics*, 2024
3. Robert L. Bassett, Austin Van Dellen, and Anthony P. Austin. Adversarial perturbations of physical signals. *Under Review: arXiv preprint arXiv:2402.17104*, 2024
4. Robert L. Bassett and Micah Y. Oh. Signal subspace methods which are robust to impulsive noise. *to appear in Statistics and Computing*, 2024
5. Robert Bassett and Julio Deride. One-step estimation with scaled proximal methods. *Mathematics of Operations Research*, 2021

6. Robert Bassett, Jacob Foster, Kay L Gemba, Paul Leary, and Kevin B Smith. The maximal eigengap estimator for acoustic vector-sensor processing. In *2021 Sensor Signal Processing for Defence Conference (SSPD)*, pages 1–5. IEEE, 2021
7. Kevin Lutz and Robert Bassett. Detecting deepfakes with inconsistent head poses: Analysis and reproducibility. *Accepted to '21 ACM Multimedia Conference, 2021*
8. Robert Bassett, Mitchell Graves, and Patrick Reilly. Color and edge-aware adversarial image perturbations. *Accepted to '21 ACM Multimedia Conference, 2021*
9. Robert Bassett and James Sharpnack. Fused density estimation: theory and methods. *Journal of the Royal Statistical Society: Series B (Statistical Methodology)*, 81(5):839–860, 2019
10. Robert Bassett and Julio Deride. Maximum a posteriori estimators as a limit of bayes estimators. *Mathematical Programming*, 174(1-2):129–144, 2019
11. Iskander Aliev, Robert Bassett, Jesús A De Loera, and Quentin Louveaux. A quantitative doignon-bell-scarf theorem. *Combinatorica*, 37(3):313–332, 2017
12. Robert Bassett, Michael Casey, and Roger JB Wets. Log-concave duality in estimation and control. *Technical Report: arXiv preprint arXiv:1607.02522*, 2016
13. Robert Bassett and Khoa Le. Multistage portfolio optimization: A duality result in conic market models. *Technical Report: arXiv preprint arXiv:1601.00712*, 2016

### *Presentations and Invited Talks*

- 2024: 2024 CSU Monterey Bay Mathematics and Statistics Seminar. Monterey, CA. Get off the Hype Train: why Using Neural Networks Can Be Very Risky.
- 2023: 2023 International Conference on Stochastic Optimization. Davis, CA. Physically Realizable Adversarial Perturbations of Acoustic Signals.
- 2023: 2023 SIAM Conference on Optimization. Seattle, WA. An SDP-Based Branch and Bound Algorithm for Optimal Sensor Placement.
- 2022: International Conference on Continuous Optimization, Bethlehem, PA. One-Step Estimation with Scaled Proximal Methods.
- 2022: Robustness and Resilience in Stochastic Optimization and Statistical Learning, Erice, Italy. One-Step Estimation with Scaled Proximal Methods.
- 2021: Sensor and Signal Processing in Defence Conference. The Maximal Eigengap Estimator for Acoustic Vector-Sensor Processing.
- 2021: 2021 SIAM Conference on Optimization. One-Step Estimation with Scaled Proximal Methods.
- 2020: MORS Emerging Techniques Forum. Plenary speaker: New Ways for Adversaries to Interrupt Neural Network Image Classifiers.
- 2019: ICIAM meeting in Valencia, Spain. Contributed presentation: Density Estimation on Simplicial 1-Complexes.
- 2019: DAGStat meeting in Munich, Germany. Contributed presentation: Fused Density Estimation on Infrastructure Networks.
- 2019: Joint Mathematics Meeting in Baltimore. Contributed presentation: Likelihood Smoothing via the Moreau Envelope.

## Classes Taught

NPS OS4118: *Statistical and Machine Learning*. Summer 2023-Present.

NPS OA4930: *Mathematical Statistics*. Spring 2023-Present.

NPS OA3101: *Probability*. Fall 2022-Present.

NPS OA3802: *Computational Methods for Data Analysis*. Spring 2022-Present.

NPS OA3103: *Data Analysis*. 2018-Present.

NPS OS3105: *Introductory Statistics*. 2018-2021.

Numerous mathematics and statistics courses at UC Davis.

## Academic

### *Service*

Editorial: Computational Optimization and Applications (Associate Editor), Mathematical Programming Computation (Technical Editor)

Publications refereed: SIAM Journal of Optimization, Mathematical Programming, Mathematical Programming Computation, Mathematics of Operations Research, International Conference on Machine Learning (ICML), International Conference on Learning Representations (ICLR), Computer Vision and Pattern Recognition (CVPR), International Conference in Computer Vision (ICCV), Operations Research, Set-Valued and Variational Analysis, Naval Research Logistics

### *Meetings Organized*

Member of the Technical Program Committee: 2024 SIAM Northern & Central California Section Meeting

Applications to National Security Minisymposium. 2023 International Conference on Stochastic Programming.

Applications of Semidefinite Programming Minisymposium. 2023 SIAM Optimization Meeting.

Optimization in Statistics Minisymposium. 2021 SIAM Optimization Meeting.

Optimization in Statistics sessions. 2018 INFORMS Annual Meeting. Phoenix, AZ.

### *Grants*

ONR Research Grant (with A. Austin and J. Royset), "Physical Access to Autonomous Systems: Adversarial Manipulation, Robustness, and Real-Time Computation". 2023-2025. \$648K.

ONR Research Grant (with P. Leary and J. Royset), "Decision Theoretic and Algorithmic Foundations for Autonomy in Adversarial Environments". 2020-2022. \$501K.

National Security Agency Research Grant (with J. Huang) "Machine Learning Methods for Autonomous Collection and Analysis in the Maritime Domain". 2020-2023. \$508K

### *Students Advised*

LtCol Christopher Bromley. *Application of Reinforcement Learning to Air-to-Air Fighter Tactics*. 2024. Award Winner–Military Operations Research Society (MORS) Thesis Award

Capt AJ Van Dellen. *Computation of Adversarial Perturbations Under Physical Access*. 2023. Award Winner–Chief of Naval Operations Award for Excellence in Operations Research.

CAPT Dylan Hyde. *Disguising Underwater Signals with PDE Constrained Optimization*. 2023.

ENS Micah Oh. *Robustifying Signal Subspace Methods with Group SLOPE*. 2022.

LT Erik Vargas. *Optimal Placement of Shallow Water Sensors*. 2022.

MAJ William Brown. *The Use of Regression Models for Detecting Digital Fingerprints in Synthetic Audio*. 2022.

Capt Jacob Foster: *Surface Vessel Acoustic Signal Direction of Arrival Estimation by Vector Sensor Processing with the Maximal Eigengap Estimator*. 2021. Award Winner–Naval Undersea Warfare Center Thesis Award

Capt Patrick Reilly: *A Generalized Analytic for the Detection of Synthetic Media*. 2021.

LT Kevin Lutz. *Challenges in Detecting DeepFakes with Inconsistent Head Poses*. 2021

MAJ Diego Rincon: *The U.S Army Medical Service Corp Area of Concentration Matching System*. 2020. Award Winner–Military Operations Research Society (MORS) Thesis Award

LT John Kim: *Automating Vessel Detection with Passive Sonar Signal and Convolutional Neural Networks*. 2020.

Capt Mitchell Graves: *Image Perturbation Generation: Exploring New Ways for Adversaries to Interrupt Neural Network Image Classifiers*. 2020

### *Related Qualifications*

Programming Experience: Python, Julia, R, C, C++, Fortran, SQL.

Licensed Amateur Radio Operator, General Class