

# Brendon G. Anderson

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<b>Education</b>	<b>University of California, Berkeley</b> Ph.D. in Control Theory <i>Advisor:</i> Somayeh Sojoudi <i>Research Areas:</i> Optimization, Machine Learning, Control Theory <i>Minors:</i> Mathematics, Optimization	Aug. 2018 – Present
	<b>University of California, Berkeley</b> M.S. in Control Theory <i>Thesis: Towards Optimality and Robustness Guarantees for Data-Driven Learning and Decision Making</i>	Aug. 2018 – May 2020
	<b>University of California, Los Angeles</b> B.S. in Mechanical Engineering ( <i>summa cum laude</i> ) <i>Technical Breadth Area:</i> Mathematics	Sep. 2015 – Mar. 2018

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<b>Research Experience</b>	<b>Graduate Student Researcher — UC Berkeley</b> <i>Advisor:</i> Somayeh Sojoudi	Aug. 2018 – Present
	<b>Jr. Development Engineer — UCLA Engineering</b> <i>Advisor:</i> Robert M'Closkey	Jan. 2018 – Jun. 2018
	<b>Research Assistant — UCLA Mathematics</b> <i>Advisors:</i> Matt Haberland, Olga Turanova, and Andrea L. Bertozzi	Jun. 2017 – Aug. 2017

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<b>Publications</b>	<ul style="list-style-type: none"><li>[1] T. Gautam, <b>B. G. Anderson</b>, S. Sojoudi, and L. El Ghaoui, “A sequential greedy approach for training implicit deep models,” <i>Under review</i>, 2022. URL <a href="https://people.eecs.berkeley.edu/~tgautam23/publications/ImplicitSequential_Preprint.pdf">https://people.eecs.berkeley.edu/~tgautam23/publications/ImplicitSequential_Preprint.pdf</a>.</li><li>[2] Y. Bai, <b>B. G. Anderson</b>, and S. Sojoudi, “Avoiding the accuracy-robustness trade-off of classifiers via local adaptive smoothing,” <i>Under review</i>, 2022. URL <a href="https://brendon-anderson.github.io/files/publications/bai2022avoiding.pdf">https://brendon-anderson.github.io/files/publications/bai2022avoiding.pdf</a>.</li><li>[3] <b>B. G. Anderson</b> and S. Sojoudi, “Data-driven certification of neural networks with random input noise,” <i>Under review</i>, 2022. URL <a href="https://brendon-anderson.github.io/files/publications/anderson2022data-long.pdf">https://brendon-anderson.github.io/files/publications/anderson2022data-long.pdf</a>.</li><li>[4] <b>B. G. Anderson</b>, Z. Ma, J. Li, and S. Sojoudi, “Partition-based convex relaxations for certifying the robustness of ReLU neural networks,” <i>Under review</i>, 2021. URL <a href="https://arxiv.org/pdf/2101.09306.pdf">https://arxiv.org/pdf/2101.09306.pdf</a>.</li></ul>	
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- [5] **B. G. Anderson** and S. Sojoudi, “Certified robustness via locally biased randomized smoothing,” in *Proceedings of the 4th Annual Learning for Dynamics and Control Conference (L4DC)*, 2022.
- [6] F. Gama, **B. G. Anderson**, and S. Sojoudi, “Node-variant graph filters in graph neural networks,” in *Proceedings of the IEEE Data Science and Learning Workshop (DSLW)*, 2022.
- [7] **B. G. Anderson**, Z. Ma, J. Li, and S. Sojoudi, “Tightened convex relaxations for neural network robustness certification,” in *Proceedings of the 59th IEEE Conference on Decision and Control (CDC)*, 2020.
- [8] **B. G. Anderson** and S. Sojoudi, “Global optimality guarantees for nonconvex unsupervised video segmentation,” in *Proceedings of the 57th Annual Allerton Conference on Communication, Control, and Computing*, 2019.
- [9] **B. G. Anderson**, E. Loeser, M. Gee, F. Ren, S. Biswas, O. Turanova, M. Haberland, and A. L. Bertozzi, “Quantifying robotic swarm coverage,” in *Informatics in Control, Automation and Robotics: 15th International Conference, ICINCO 2018, Porto, Portugal, July 29–31, 2018, Revised Selected Papers*, vol. 613 of *Lecture Notes in Electrical Engineering*, pp. 276–301, Springer, 2019.
- [10] **B. G. Anderson**, E. Loeser, M. Gee, F. Ren, S. Biswas, O. Turanova, M. Haberland, and A. L. Bertozzi, “Quantitative assessment of robotic swarm coverage,” in *Proceedings of the 15th International Conference on Informatics in Control, Automation and Robotics (ICINCO)*, 2018.

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<b>Invited Talks</b>	1. INFORMS Annual Meeting, Anaheim, CA	Oct. 2021
	“Data-driven certification of neural networks with random inputs.” Research presentation.	
	2. Tsinghua-Berkeley Shenzhen Institute, Berkeley, CA	May 2021
	“Robust neural networks.” Guest lecture for <i>Optimization Theory and Machine Learning</i> .	
	3. University of Michigan, Ann Arbor, MI	Apr. 2021
	“Robust neural networks.” Guest lecture for <i>Advanced Topics in Applied Data Analytics</i> (IOE 491).	
	4. INFORMS Annual Meeting, National Harbor, MD	Nov. 2020
	“Partition-based convex relaxations for robustness certification of ReLU neural networks.” Research presentation.	
	5. Conference on Control Technology and Applications, Montréal	Aug. 2020
	“Robustness analysis of neural networks.” Tutorial session.	
	6. Institute for Pure and Applied Mathematics, Los Angeles, CA	Aug. 2017
	“Robotic swarm analysis.” Research presentation.	

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<b>Awards</b>	1. John and Janet McMurtry Fellowship, UC Berkeley	Dec. 2020
	<i>Departmental award for academic excellence, sole recipient.</i>	
	2. Travel Support Award, Conference on Decision and Control	Dec. 2020

3. Graduate Assembly Professional Development Award, UC Berkeley Aug. 2020
4. Graduate Division Block Grant Award, UC Berkeley Apr. 2019
5. Harry M. Showman Prize, UCLA Jun. 2018  
*Schoolwide research award, sole undergraduate recipient.*
6. Jonathan David Wolfe Memorial Scholarship, UCLA Apr. 2018  
*Departmental award for academic excellence, one of two recipients.*

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<b>Teaching</b>	<b>Graduate Student Instructor — UC Berkeley</b> <ol style="list-style-type: none"> <li>1. <i>Nonlinear and Discrete Optimization</i> (IEOR 160) Fall 2021 Guest lecturer and graduate student instructor. Student ratings (0–5): Mean 4.67, Median 5, Standard deviation 0.48.</li> <li>2. <i>Nonlinear and Discrete Optimization</i> (IEOR 160) Fall 2020 Student ratings (0–5): Mean 4.54, Median 5, Standard deviation 0.76.</li> </ol> <b>Supplemental Instructor — Palomar College</b> <ol style="list-style-type: none"> <li>1. <i>Electromagnetism</i> (PHYS 231) Spring 2015</li> <li>2. <i>General Chemistry</i> (CHEM 115) Fall 2014, Spring 2015</li> </ol>
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<b>Professional Activities</b>	<ol style="list-style-type: none"> <li>1. Organizer and co-chair of the session “Safety and Robustness in Machine Learning,” INFORMS Annual Meeting, 2022.</li> <li>2. Reviewer for IEEE Control Systems Letters, 2022.</li> <li>3. Reviewer for IEEE Open Journal of Control Systems, 2022.</li> <li>4. Organizer and co-chair of the session “Robustness of Neural Networks,” INFORMS Annual Meeting, 2021.</li> <li>5. Graduate Student Mentor for incoming students, hosted by UC Berkeley Mechanical Engineering Graduate Student Council, 2021.</li> <li>6. Reviewer for Conference on Decision and Control (CDC), 2021.</li> <li>7. Reviewer for IEEE Transactions on Automatic Control, 2021.</li> <li>8. Reviewer for Artificial Intelligence and Statistics Conference (AISTATS), 2020.</li> <li>9. Reviewer for American Control Conference (ACC), 2020.</li> <li>10. Peer Advisor for the Bay Area Graduate Pathways to Stem (GPS) program, hosted by UC Berkeley Engineering and Stanford Engineering, 2020.</li> <li>11. Grant proposal contributor; assisted with writing DARPA funding proposal, 2019.</li> <li>12. Chair of the session “Data Analytics,” 57th Annual Allerton Conference on Communication, Control, and Computing, 2019.</li> </ol>
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