Brendon G. Anderson

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Education	**University of California, Berkeley**	Aug. 2018 – Present
	Ph.D. in Control Theory	
	Advisor: Somayeh Sojoudi	
	Research Areas: Optimization, Machine Learning, Control Theory	
	Minors: Mathematics, Optimization	
	University of California, Berkeley	Aug. 2022 – Present
	M.A. in Mathematics	
	University of California, Berkeley	Aug. 2018 – May 2020
	M.S. in Control Theory	
	Thesis: Towards Optimality and Robustness Guarantees for Data-Driven Learning and Decision Making	
	University of California, Los Angeles	Sep. 2015 – Mar. 2018
	B.S. in Mechanical Engineering (*summa cum laude*)	
	Technical Breadth Area: Mathematics	

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

Publications

[1] S. Pfrommer, **B. G. Anderson**, and S. Sojoudi, "Projected randomized smoothing for certified adversarial robustness," *Under review*, 2022. URL https://brendon-anderson.github.io/files/publications/pfrommer2022projected.pdf.

[2] Y. Bai, **B. G. Anderson**, and S. Sojoudi, "Avoiding the accuracy-robustness trade-off of classifiers via local adaptive smoothing," *Under review*, 2022. URL https://brendon-anderson.github.io/files/publications/bai2022avoiding.pdf.

[3] **B. G. Anderson**, Z. Ma, J. Li, and S. Sojoudi, "Partition-based convex relaxations for certifying the robustness of ReLU neural networks," *Under review*, 2021. URL https://arxiv.org/pdf/2101.09306.pdf.

[4] T. Gautam, **B. G. Anderson**, S. Sojoudi, and L. El Ghaoui, "A sequential greedy approach for training implicit deep models," in *Proceedings of the 61st IEEE Conference on Decision and Control (CDC)*, 2022.

[5] **B. G. Anderson** and S. Sojoudi, "Data-driven certification of neural networks with random input noise," *IEEE Transactions on Control of Network Systems*, 2022.

[6] **B. G. Anderson**, S. Pfrommer, and S. Sojoudi, "Towards optimal randomized smoothing: A semi-infinite linear programming approach," in *ICML Workshop on Formal Verification of Machine Learning (WFVML)*, 2022. One of six selected for oral presentation.

[7] **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.

[8] 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.

[9] **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.

[10] **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.

[11] **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.

[12] **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.

Invited Talks and Poster Presentations		
1.	NorCal Control Workshop, UC Santa Cruz, Santa Cruz, CA	June 2022
	"Certified robustness via locally biased randomized smoothing." Research poster presentation.	
2.	Tsinghua-Berkeley Shenzhen Institute, Berkeley, CA	May 2022
	"Robust neural networks." Guest lecture for *Optimization Theory and Machine Learning*.	
3.	INFORMS Annual Meeting, Anaheim, CA	Oct. 2021
	"Data-driven certification of neural networks with random inputs." Research talk.	
4.	Tsinghua-Berkeley Shenzhen Institute, Berkeley, CA	May 2021
	"Robust neural networks." Guest lecture for *Optimization Theory and Machine Learning*.	

	5. University of Michigan, Ann Arbor, MI	Apr. 2021

5. University of Michigan, Ann Arbor, MI — Apr. 2021
"Robust neural networks." Guest lecture for *Advanced Topics in Applied Data Analytics* (IOE 491).

6. INFORMS Annual Meeting, National Harbor, MD — Nov. 2020
"Partition-based convex relaxations for robustness certification of ReLU neural networks." Research talk.

7. Conference on Control Technology and Applications, Montréal — Aug. 2020
"Robustness analysis of neural networks." Tutorial session.

8. Institute for Pure and Applied Mathematics, Los Angeles, CA — Aug. 2017
"Robotic swarm analysis." Research talk.

Awards

1. Graduate Division Block Grant Award, UC Berkeley — May. 2022

2. John and Janet McMurtry Fellowship, UC Berkeley — Dec. 2020
Departmental award for academic excellence, sole recipient.

3. Travel Support Award, Conference on Decision and Control — Dec. 2020

4. Graduate Assembly Professional Development Award, UC Berkeley — Aug. 2020

5. Graduate Division Block Grant Award, UC Berkeley — Apr. 2019

6. Harry M. Showman Prize, UCLA — Jun. 2018
Schoolwide research award, sole undergraduate recipient.

7. Jonathan David Wolfe Memorial Scholarship, UCLA — Apr. 2018
Departmental award for academic excellence, one of two recipients.

Teaching

Graduate Student Instructor — UC Berkeley

1. *Nonlinear and Discrete Optimization* (IEOR 160) — Fall 2021
Guest lecturer and graduate student instructor.
Student ratings (0–5): Mean 4.67, Median 5, Standard deviation 0.48.

2. *Nonlinear and Discrete Optimization* (IEOR 160) — Fall 2020
Student ratings (0–5): Mean 4.54, Median 5, Standard deviation 0.76.

Supplemental Instructor — Palomar College

1. *Electromagnetism* (PHYS 231) — Spring 2015

2. *General Chemistry* (CHEM 115) — Fall 2014, Spring 2015

Professional Activities

1. Graduate Student Mentor for incoming students, hosted by UC Berkeley Mechanical Engineering Graduate Student Council, 2022.

2. Reviewer for Conference on Neural Information Processing Systems (NeurIPS), 2022.

3. Reviewer for Conference on Decision and Control (CDC), 2022.

4. Organizer and co-chair of the session "Safety and Robustness in Machine Learning," INFORMS Annual Meeting, 2022.

5. Reviewer for IEEE Control Systems Letters, 2022.

6. Reviewer for IEEE Open Journal of Control Systems, 2022.

7. Organizer and co-chair of the session "Robustness of Neural Networks," INFORMS Annual Meeting, 2021.

8. Graduate Student Mentor for incoming students, hosted by UC Berkeley Mechanical Engineering Graduate Student Council, 2021.

9. Reviewer for Conference on Decision and Control (CDC), 2021.

10. Reviewer for IEEE Transactions on Automatic Control, 2021.

11. Reviewer for Artificial Intelligence and Statistics Conference (AISTATS), 2020.

12. Reviewer for American Control Conference (ACC), 2020.

13. Peer Advisor for the Bay Area Graduate Pathways to Stem (GPS) program, hosted by UC Berkeley Engineering and Stanford Engineering, 2020.

14. Grant proposal contributor; assisted with writing DARPA funding proposal, 2019.

15. Chair of the session "Data Analytics," 57th Annual Allerton Conference on Communication, Control, and Computing, 2019.