

# Brendon G. Anderson

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

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<b>Experience</b>	<b>Graduate Student Researcher — UC Berkeley</b>	Aug. 2018 – Present
	<i>Advisor:</i> Somayeh Sojoudi <ul style="list-style-type: none"><li>Conducted various research projects on robustness and optimality guarantees for convex and nonconvex optimization problems in machine learning.</li></ul>	
	<b>Jr. Development Engineer — UCLA Engineering</b>	Jan. 2018 – Jun. 2018
	<i>Advisor:</i> Robert M'Closkey <ul style="list-style-type: none"><li>Designed, fabricated, and tested low-frequency folded pendulum accelerometer for use in UCLA's dynamic systems and control laboratories.</li></ul>	
	<b>Research Assistant — UCLA Mathematics</b>	Jun. 2017 – Aug. 2017
	<i>Advisors:</i> Matt Haberland, Olga Turanova, and Andrea L. Bertozzi <ul style="list-style-type: none"><li>Formulated performance quantification methods for swarm coverage control algorithms.</li></ul>	

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<b>Publications</b>	[1] <b>B. G. Anderson</b> and S. Sojoudi, "Certifying neural network robustness to random input noise from samples," <i>arXiv preprint arXiv:2010.07532</i> , 2020.
	[2] <b>B. G. Anderson</b> and S. Sojoudi, "Data-driven assessment of deep neural networks with random input uncertainty," <i>arXiv preprint arXiv:2010.01171</i> , 2020.
	[3] <b>B. G. Anderson</b> , Z. Ma, J. Li, and S. Sojoudi, "Tightened convex relaxations for neural network robustness certification," in <i>Proceedings of the 59th IEEE Conference on Decision and Control</i> , 2020.
	[4] <b>B. G. Anderson</b> and S. Sojoudi, "Global optimality guarantees for nonconvex unsupervised video segmentation," in <i>Proceedings of the 57th Annual Allerton Conference on Communication, Control, and Computing</i> , pp. 965–972, 2019.

- [5] **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.
- [6] **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)—Volume 2*, pp. 91–101, 2018.

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<b>Invited Talks</b>	1. INFORMS Annual Meeting, National Harbor, MD	Nov. 2020
	“Partition-based convex relaxations for robustness certification of ReLU neural networks”	
	2. Conference on Control Technology and Applications, Montréal	Aug. 2020
	“Robustness analysis of neural networks”	
	3. Institute for Pure and Applied Mathematics, Los Angeles, CA	Aug. 2017
	“Robotic swarm analysis”	

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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
	<i>Schoolwide research award, sole undergraduate recipient.</i>	
	6. Jonathan David Wolfe Memorial Scholarship, UCLA	Apr. 2018
	<i>Departmental award for academic excellence, one of two recipients.</i>	

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<b>Teaching</b>	<b>Graduate Student Instructor — UC Berkeley</b>	
	1. <i>Nonlinear and Discrete Optimization</i> (IEOR 160)	Fall 2020
	<b>Supplemental Instructor — Palomar College</b>	
	1. <i>Electromagnetism</i> (PHYS 231)	Spring 2015
	2. <i>General Chemistry</i> (CHEM 115)	Fall 2014, Spring 2015

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<b>Professional Activities</b>	1. Reviewer for Artificial Intelligence and Statistics Conference (AISTATS), 2020.	
	2. Reviewer for American Control Conference (ACC), 2020.	
	3. Peer Advisor for the Bay Area Graduate Pathways to Stem (GPS) program, hosted by UC Berkeley Engineering and Stanford Engineering, 2020.	
	4. Grant proposal contributor; assisted with writing DARPA funding proposal, 2019.	

5. Chair of the session “Data Analytics”, 57th Annual Allerton Conference on Communication, Control, and Computing, 2019.

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**Relevant  
Coursework**

**Optimization**

1. *Nonlinear Programming*, Professor Javad Lavaei
2. *Convex Optimization*, Professors Somayeh Sojoudi and Laurent El Ghaoui
3. *Optimization Models*, Professors Laurent El Ghaoui and Alex Bayen

**Machine Learning**

1. *Statistical Learning Theory* (audit), Professors Ben Recht and Moritz Hardt
2. *Learning and Optimization*, Professor Anil Aswani
3. *Deep Learning* (online), Professor Andrew Ng
4. *Machine Learning* (online), Professor Andrew Ng

**Control Theory**

1. *Nonlinear Systems: Analysis, Stability, and Control*, Professor Claire Tomlin
2. *Advanced Control Theory II* (LQ control, stochastic estimation and control, tracking and adaptive control), Professor Masayoshi Tomizuka
3. *Advanced Control Theory I* (linear systems, Lyapunov stability, state observer feedback, LQR), Professor Roberto Horowitz
4. *Linear Dynamical Systems*, Professor Robert M’Closkey
5. *Digital Control*, Professor Tsu-Chin Tsao

**Mathematics**

1. *Topology and Analysis II* (functional analysis), Professor Michael Christ
2. *Topology and Analysis I* (measure theory), Professor Alan Hammond
3. *Engineering Mathematics* (single course: linear algebra, optimization, and probability), Professors Andrew Packard, Somayeh Sojoudi, and Kameshwar Poolla
4. *Analysis (Real; Complex; Numerical)*
5. *Differential Equations (Ordinary; Partial)*

**Statistics**

1. *Theoretical Statistics* (high-dimensional), Professor Yan Shuo Tan
2. *Theoretical Statistics* (classical), Professor Will Fithian