

Brendon G. Anderson

bganderson@berkeley.edu

| | | |
|------------------|--|-----------------------|
| Education | University of California, Berkeley | 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 | |
| | University of California, Berkeley | 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> | |
| | University of California, Los Angeles | Sep. 2015 – Mar. 2018 |
| | B.S. in Mechanical Engineering (<i>summa cum laude</i>) <i>Technical Breadth Area:</i> Mathematics | |

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

| | |
|---------------------|--|
| Publications | [1] B. G. Anderson and S. Sojoudi, "Certifying neural network robustness to random input noise from samples," <i>arXiv preprint arXiv:2010.07532</i> , 2020. |
| | [2] B. G. Anderson and S. Sojoudi, "Data-driven assessment of deep neural networks with random input uncertainty," <i>arXiv preprint arXiv:2010.01171</i> , 2020. |
| | [3] B. G. Anderson , 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. G. Anderson 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.

| | | |
|----------------------|---|-----------|
| Invited Talks | 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” | |

| | | |
|---------------|---|-----------|
| Awards | 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> | |

| | | |
|-----------------|--|------------------------|
| Teaching | Graduate Student Instructor — UC Berkeley | |
| | 1. <i>Nonlinear and Discrete Optimization</i> (IEOR 160) | Fall 2020 |
| | Student ratings (0–5): Mean 4.54, Median 5, Standard deviation 0.76. | |
| | Supplemental Instructor — Palomar College | |
| | 1. <i>Electromagnetism</i> (PHYS 231) | Spring 2015 |
| | 2. <i>General Chemistry</i> (CHEM 115) | Fall 2014, Spring 2015 |

| | | |
|--------------------------------|---|--|
| Professional Activities | 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.

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