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. 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

Experience

Graduate Student Researcher — UC Berkeley Aug. 2018 – Present
Advisor: Somayeh Sojoudi
- 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
Advisor: Robert M'Closkey
- 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
Advisors: Matt Haberland, Olga Turanova, and Andrea L. Bertozzi
- Formulated performance quantification methods for swarm coverage control algorithms.

Publications

[1] **B. G. Anderson** and S. Sojoudi, "Data-driven certification of neural networks with random input noise," *preprint*, 2021.

[2] **B. G. Anderson**, Z. Ma, J. Li, and S. Sojoudi, "Partition-based convex relaxations for certifying the robustness of ReLU neural networks," *arXiv preprint arXiv:2101.09306*, 2021.

[3] **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*, 2020.

[4] **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*, 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, Anaheim, CA — Oct. 2021
   "Data-driven certification of neural networks with random inputs." Research presentation.
2. University of Michigan, Ann Arbor, MI — Apr. 2021
   "Robust neural networks." Guest lecture for *Advanced Topics in Applied Data Analytics* (IOE 491).
3. INFORMS Annual Meeting, National Harbor, MD — Nov. 2020
   "Partition-based convex relaxations for robustness certification of ReLU neural networks." Research presentation.
4. Conference on Control Technology and Applications, Montréal — Aug. 2020
   "Robustness analysis of neural networks." Tutorial session.
5. Institute for Pure and Applied Mathematics, Los Angeles, CA — Aug. 2017
   "Robotic swarm analysis." Research presentation.

Awards

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

Teaching

Graduate Student Instructor — UC Berkeley

1. *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. Organizer and co-chair of the session "Robustness of Neural Networks," INFORMS Annual Meeting, 2021.
2. Reviewer for Conference on Decision and Control, 2021.
3. Reviewer for Transactions on Automatic Control, 2021.
4. Reviewer for Artificial Intelligence and Statistics Conference (AISTATS), 2020.
5. Reviewer for American Control Conference (ACC), 2020.
6. Peer Advisor for the Bay Area Graduate Pathways to Stem (GPS) program, hosted by UC Berkeley Engineering and Stanford Engineering, 2020.
7. Grant proposal contributor; assisted with writing DARPA funding proposal, 2019.
8. Chair of the session "Data Analytics," 57th Annual Allerton Conference on Communication, Control, and Computing, 2019.