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: Optimization, Statistics

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 surrounding robustness and optimality guarantees for 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.

CVT Analysis, Design, Control — Baja SAE Sept. 2015 – Jun. 2018

- Developed electronic continuously variable transmission (CVT) and executed system identification and control.
- Modeled mechanical CVT and constructed flyweight optimization program.

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**, 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.

[2] **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.

[3] **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.

[4] **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.

Awards

- Graduate Division Block Grant Award, UC Berkeley — Apr. 2019
- Harry M. Showman Prize (schoolwide research award), UCLA — Jun. 2018
- Jonathan David Wolfe Memorial Scholarship, UCLA — Apr. 2018

Teaching

Supplemental Instructor — Palomar College

- *Electromagnetism* (PHYS 231) — Spring 2015
- *General Chemistry* (CHEM 115) — Fall 2014, Spring 2015

Professional Activities

- Peer Advisor for the Bay Area Graduate Pathways to Stem (GPS) program, hosted by UC Berkeley Engineering and Stanford Engineering, 2020.
- Grant proposal contributor; assisted with writing DARPA funding proposal, 2019.
- Chair of the session "Data Analytics", 57th Annual Allerton Conference on Communication, Control, and Computing, 2019.

Relevant Coursework

Optimization

- *Nonlinear Programming*, Professor Javad Lavaei
- *Convex Optimization*, Professors Somayeh Sojoudi and Laurent El Ghaoui
- *Optimization Models*, Professors Laurent El Ghaoui and Alex Bayen

Machine Learning

- *Statistical Learning Theory* (audit), Professors Ben Recht and Moritz Hardt
- *Learning and Optimization*, Professor Anil Aswani
- *Deep Learning* (online), Professor Andrew Ng
- *Machine Learning* (online), Professor Andrew Ng

Control Theory

- *Nonlinear Systems: Analysis, Stability, and Control*, Professor Claire Tomlin
- *Advanced Control Theory I*, Professor Roberto Horowitz
- *Advanced Control Theory II*, Professor Masayoshi Tomizuka

- *Linear Dynamic Systems*, Professor Robert M'Closkey
- *Digital Control*, Professor Tsu-Chin Tsao

Mathematics and Statistics

- *Theoretical Statistics* (*Classical*), Professor Will Fithian
- *Theoretical Statistics* (*High-dimensional*), Professor Yan Shuo Tan
- *Engineering Mathematics*, Professors Andrew Packard, Somayeh Sojoudi, and Kameshwar Poolla
- *Analysis* (*Real*; *Complex*; *Numerical*)
- *Differential Equations* (*Ordinary*; *Partial*)

Skills

Programming: MATLAB, Python, C++, CVX
Tools and Applications: LaTeX, Ti*k*Z, LabVIEW