

Dominic Carrano

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Education

University of California, Berkeley

M.S. in Electrical Engineering and Computer Science

08/2020 - 05/2021

Advisor: Prof. Kannan Ramchandran • **Research Area:** Distributed Machine Learning

B.S. in Electrical Engineering and Computer Science

08/2016 - 05/2020

Major GPA: 3.85/4 • **Cumulative GPA:** 3.80/4

Experience

Hardware Test Automation Intern • Apple, Inc.

06/2020 - 08/2020

- Developed a Python API for object detection and RGB-D camera streaming that leveraged computer vision, machine learning, and statistics techniques to determine 3D object coordinates precise to within ± 2 mm for robotic automation testing.
- Packaged and shipped the API on the company internal PyPI server, giving 20+ users across 7+ hardware testing teams an automated replacement for their time-intensive manual depth calibration procedures.
- Presented project to the VP of Product Integrity, and was one of only 6 of 45 Product Integrity interns invited to do so.

Signal Processing Intern • Lawrence Livermore National Laboratory

05/2019 - 08/2019

- Reduced mean squared error of laser signal acquisition algorithm by 5x and saved \$2 million over previously proposed method by using fiducial signal to approximate impulse response measurements, eliminating the need to take multiple impulse shots.
- Developed and shipped MATLAB tool to calibrate raw data from all 48 of the National Ignition Facility's 3 ω laser diagnostics by implementing provably optimal parametric fits, giving a way to track diagnostic tool health for future experiments.

Signal Processing Intern • Lawrence Livermore National Laboratory

05/2018 - 08/2018

- Quantified previously unknown variance in laser measurements by implementing Monte Carlo-based error propagation in MATLAB, leading to 3% less error after improving the deconvolution algorithm. Presented work at SPIE Conference in February 2019.

Teaching

Head TA for EECS 127: Optimization Models in Engineering • UC Berkeley

08/2020 - Present

- Managed a 16-person teaching team and a 300-student course as head TA in fall 2020 semester, coordinating with the professor.
- Taught weekly 30-student sections on linear algebra, vector calculus, convex optimization, and gradient descent algorithms.

Head TA and TA for EECS 120: Signals and Systems • UC Berkeley

08/2018 - 05/2020

- Managed an 8-person teaching team and a 130-student course as head TA in spring 2019, fall 2019, and spring 2020 semesters.
- Taught weekly 30-student sections on signal processing, linear time-invariant system theory, and several of their applications.
- Initiated and spearheaded project to create six new applications-driven Jupyter Notebook virtual labs in the spring 2019 semester.
- Solicited and utilized student feedback to fine-tune the labs, and led the spring 2020 team to create four more for a full set of 10.
- Received an average end-of-semester TA rating of 4.29/5 (fall '18), 4.59/5 (spring '19), 4.77/5 (fall '19), and 4.70/5 (spring '20), all on anonymous student surveys with 80% or higher response rates, proving consistent teaching effectiveness.

Publications

- V. Gupta*, D. Carrano*, Y. Yang, V. Shankar, T. Courtade, K. Ramchandran. *Serverless Straggler Mitigation using Local Error-Correcting Codes*. IEEE International Conference on Distributed Computing Systems, Singapore, 2020. [[pdf](#)] [[code](#)]
- D. Carrano, I. Chugunov, J. Lee, B. Ayazifar. *Self-Contained Jupyter Notebook Labs Promote Scalable Signal Processing Education*. International Conference on Higher Education Advances, Valencia, Spain, 2020. [[pdf](#)] [[labs](#)]
- D. Carrano, R. Muir. *Deconvolution uncertainty for power sensors at the National Ignition Facility*. SPIE High Power Lasers for Fusion Research, San Francisco, California, 2019. [[pdf](#)]

Skills and Tools

Proficient: Python (+NumPy, SciPy, Matplotlib, PyPI), MATLAB, Jupyter Notebook, Intel RealSense, Soccer Fullback

Familiar: Java, C, Unix/Linux Terminal, Mac OS, LaTeX, HTML, Git, GitHub, Markdown, Digital Oscilloscopes

Achievements

2019-2020 EECS Distinguished TA Award, UC Berkeley EECS Department

04/2020

2019-2020 Outstanding TA Award, UC Berkeley

04/2020

Eagle Scout, Boy Scouts of America

10/2012