Dominic Carrano

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Education

University of California, Berkeley August 2016 - May 2020
B.S. Electrical Engineering and Computer Science **GPA:** 3.8 (Major) • 3.74 (Cum.)

Coursework: *Optimization Models, Efficient Algorithms and Intractable Problems, Probability and Random Processes, Digital Signal Processing, Signals and Systems, Operating Systems and Systems Programming, Computer Architecture, Data Structures, Discrete Math, Multivariable Calculus, Linear Algebra, Electricity and Magnetism, Thermodynamics, Mechanics and Wave Motion*

Experience

Signal Processing Intern • Lawrence Livermore National Laboratory (Livermore, CA) May 2018 - August 2018

- Implemented Monte Carlo method to quantify previously unknown laser diagnostic error bars, and developed improvements to diagnostic system's existing deconvolution algorithm that increased accuracy by a factor of > 2.
- Deployed implementation to diagnostic system to predict and reduce error bars of future shot diagnostics.
- Presented algorithm for deconvolving clipped data that reduced distortion by a factor of 10 over previous methods.
- Co-authored paper on Monte Carlo deconvolution techniques; work to be presented at SPIE High Power Lasers for Fusion Research V conference in February 2019.

Cyber Defender Intern • Lawrence Livermore National Laboratory (Livermore, CA) Summer 2015, 2016, 2017

- Researched and presented options for replacing network mapping tool's 15+ year old user interface to improve aesthetics.
- Created and taught a course on Python programming to 35 graduate and undergraduate interns with 10 lectures supplemented by slides, notes, demos, and practice problems on Python features and programming concepts.
- Migrated portion of network mapping tool from Oracle SQL to free PostgreSQL, saving $600,000 per customer.

Teaching

EE 120 Head Undergraduate Student Instructor • UC Berkeley EECS Department (Berkeley, CA) January 2019 - Present

- Led a class of 130+ students and a staff of 5 TAs, running staff meetings, handling class logistics, answering student questions on online Q&A forum, and directing exam and homework rubric creation and grading.
- Created 5 new iPython notebook homework assignments to let students implement applications of content. Assignments covered Filtering, The Fast Fourier Transform, 1D Signal and 2D Image Deconvolution, Orthogonal Signaling, and PID Control.
- Held office hours and taught weekly 40+ student sections on linear system theory, Fourier analysis, and sampling theory.

EE 120 Undergraduate Student Instructor • UC Berkeley EECS Department (Berkeley, CA) August 2018 - December 2018

- Created supplemental iPython demos illustrating Audio Receiver Frequency Drift and the Discrete Time Fourier Transform.
- Held office hours and taught weekly 40+ student sections on linear system theory, Fourier analysis, and sampling theory.
- Helped create a new set of worksheets + solutions with practice problems for weekly TA-led class discussion sections.

EE 16A Mentor and Co-Coordinator • Computer Science Mentors (CSM) (Berkeley, CA) January 2018 - Present

- Responsible for interviewing and selecting candidates from applicant pool to become new CSM EE 16A Mentors.
- In charge of all 40+ of the club's EE 16A mentors, ensuring content familiarity and providing pedagogical guidance.
- Taught weekly sections to 6 students on linear algebra, circuits, least squares regression, and matched filtering.

Skills and Tools

Proficient: Python (+numpy, scipy, matplotlib, iPython/Jupyter Notebook), LaTeX, Unix/Linux
Familiar: Java, C, MATLAB, RISC-V Assembly, HTML, CSS, Git, GitHub, Eclipse, IntelliJ, gdb

Achievements

Eagle Scout, Boy Scouts of America October 2012
Designed and installed a new driveway for Saint Michael's Church in Livermore, CA for Eagle Project.