

Neelesh Ramachandran

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EDUCATION

University of California, Berkeley: College of Engineering

B.S. Electrical Engineering & Computer Sciences (EECS)

Expected Graduation: May 2022

GPA: 3.97

Selected Coursework: Microfabrication Tech. (EE 143)[†], Micromechanical Systems (MEMS, EE 147)[†], Quantum Mechanics (Physics 137A)[†], Parallel Programming[†] (CS 194-15), Digital IC Design (EECS 151)^{*}, Analog IC Design (EE 140), Convex Optimization (EE 127), OS / Systems Programming (CS 162), Microelectronic Circuits (EE 105)^{*}, IC Device Physics (EE 130)^{*}, Computer Architecture (CS 61C)^{*}, Signals & Systems (EE 120), Optical Engineering (EE 118)^{*}, Data Structures & Algorithms (CS 61B)

†: Taking in Fall 2021.

*: Received Grade of A+

WORK EXPERIENCE

Apple / Silicon Engineering Group, Power Manager (PMGR) Design Verification Intern (15 weeks)

May – August 2021

- Implemented extensive automation (>50x time-savings) with from-scratch Python3, YAML/JSON scripting infrastructure.
- Revamped a chip-level testbench into a block-level testbench to decrease build- and run-times by over 85%.
- Designed and incorporated a new interface design to collect functional coverage.
- Learned System Verilog, UVM verification, functional coverage collection and reports, and auto-parsing of RTL.

MuMec Inc. / Electrical Engineering Intern (Project Lead) (11 weeks)

May – August 2020

- Built, programmed, and tested a functional hearing aid with custom firmware and DSP algorithms.
- Designed impedance matching network to optimize RF signal strength, validated the core chipset using test equipment.
- Incorporated Bluetooth Speech-To-Text functionality using CMU Pocketsphinx open-source firmware.
- Performed precision hand-soldering (0402 components) and learned reflow soldering for 0201 components.

6-semester TA/uGSI for Devices & Systems I and II (EECS 16A/B) / Content, Discussion, Software

August 2019 – Present

- Wrote 8 discussion worksheets, taught recorded sections viewed by 700+ students, and developed ~150 pages of notes in Sp21.
- Coordinate all 16B software (Website, Piazza, Gradescope assignment submission, etc.), leading project developments.
- Independently authored a ~130 page textbook with content and practice problems + solutions. 30,000 visits since Summer '20.
- Writing algorithms with a team to intelligently form student study-groups based on survey responses, to help remote learning.

CLUB/PROJECT EXPERIENCE

Berkeley Formula Racing (FSAE) / Electrical Subsystem Co-Lead

August 2018 – May 2020

- Designed custom PCBs (brake thermocouple board, combined accelerometer/gyroscope board, and others).
- Optimized routing and manufacturing of 3 modular wire harnesses (ECU (engine), ADL (sensors), Power).
- Developed live telemetry, shifting-lights PCB, ECU/ADL Validity Checker, automated wire-routing, and others.

UC Berkeley IEEE Student Branch / Director of Professional Development

August 2018 – December 2019

- Organized events such as Resume Workshops, Graduate Research Mixers, Interview Workshops, and more.
- Worked closely in the Engineering community to help students present their best self to industry professionals.

RESEARCH EXPERIENCE

LEED Lab / Undergraduate Student Researcher

August 2020 – Present

- Designing a next-generation memory device exploiting memory of a ferroelectric layer (Sentaurus Workbench, TCAD).
- Simulating ferroelectric gate layers for increased hysteresis (memory window) and efficient transistor read/write operations.
- Investigating excess carrier dynamics in the channel of our FDSOI FeFET transistor to minimize read delay, and optimize endurance and read margin. Develop larger memory windows and FE layer polarization at a given programming voltage.

SWARM Lab / Undergraduate Student Researcher

January 2019 – December 2019

- MRI/EEG integration project: Conceptualized hardware design for ongoing MRI/EEG project.
- Investigated functional, portable “earth’s field” MRI machine; constructed analog-circuit filters to tune performance.

SKILLS

Hardware: Analog Circuit Design, RF Circuits, Schematic Capture, Device Design, TCAD, Spice, Prototype, PCB Design & Manufacturing, Chip/Board Testing, Verilog / System Verilog, FPGA, UVM, Functional Coverage, Code Coverage, Coverage Analysis, Design Verification & Validation, Precision Hand-Soldering, Reflow Soldering, Hardware QA, Digital Signal Processing

Software: Python, Java, C, Perl, RISC-V, Matlab, Data Structures, Algorithms, Operating Systems, Data Analysis, Debugging (GDB)

Other: LaTeX, Git, Technical Writing, Applied Research, Teaching, Mathematica