

Averal N. Kandala
Medical Device Researcher
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EDUCATION

University of California, Berkeley *June 2020 - Present*
M.S. in Electrical Engineering & Computer Sciences
Advisors: Professor Ali M. Niknejad, Professor M. Mekkai Anwar (UCSF)

University of California, Berkeley *August 2016 - May 2020*
B.S. in Electrical Engineering & Computer Sciences GPA: 3.972/4.0; Highest Honors

Selected Coursework: Advanced Analog ICs (A), Analog ICs (A), Digital ICs (A+), FPGA Lab (A-), Digital Signal Processing (A+), Semiconductor Device Physics (A+), Computer Architecture (A), Probability & Random Processes (A), MEMS (A+), Feedback & Control Systems (A), Signals & Systems (A+), Data Structures (A-), Astrophysics (A+), Comparative Literature (A+)

RESEARCH

UCSF / Berkeley Wireless Research Center (BWRC) *June 2020 - Present*
Graduate Student Researcher

I am currently working under the supervision of Profs. Niknejad and Anwar to evaluate the efficacy of using alpha radiation from clinical radionuclides to power medical implants via scintillating quantum dots and photovoltaic arrays. We intend to use this strategy to develop a chronic implantable “biohub” SoC that can act as a substrate for sensor/stimulator chips and relay communication between external devices and other implants.

UC Berkeley Swarm Lab *June 2019 - May 2020*
Undergraduate Student Researcher

As a member of Prof. Michel Maharbiz’s bio-focused research group, under the supervision of Drs. Soner Sonmezoglu and Konlin Shen, I helped to characterize the effect of “anchor loss” in energy harvesting by piezoelectric crystals during ultrasonic digital communication via backscatter modulation, with the end goal of developing smaller medical implants for deeper implantability. I assembled an experimental setup for this project with a low-noise data acquisition system and Python GUI, writing Verilog descriptions for an FPGA signal controller and designing PCBs.

AWARDS

National Science Foundation (NSF) Graduate Research Fellowship *2020*
Stipend of \$34,000 and tuition allowance of \$12,000 for three out of five fellowship years.

Elena Catelli and Kenneth Leung Memorial Scholarships *2016*
Gift awards for academic excellence in Italian and future study of electrical engineering.

TEACHING

Microelectronic Devices & Circuits (EE 105) *Spring 2020*
Undergraduate Student Instructor Evaluation: 4.67/5.0
Teaching with Prof. Niknejad, I was responsible for discussion and laboratory section instruction. I also delivered administrative announcements, held regular office hours, led exam review sessions, responded to Piazza (student forum) questions, and developed homework content.

Great Ideas in Computer Architecture (CS 61C)

Fall 2019

Undergraduate Student Instructor

Evaluation: 4.28/5.0

In addition to teaching discussion and laboratory sections, I staffed regular and project office hours, responded to Piazza (student forum) questions, and led a final review session.

Discrete Mathematics & Probability Theory (CS 70)

Summer 2019

Academic Intern

Working as a volunteer, I answered questions and facilitated discussion in office hours.

INDUSTRY

Samtec Optical Group

Summer 2018

Electrical Engineering Intern

Santa Clara, CA

I worked within the Firmware, Electrical R&D, and Optical R&D teams, focusing mainly on testing and verification. I wrote a test plan for the firmware of a few of Samtec's optical cable assemblies from scratch and executed on it, putting together a basic setup to verify that the firmware was performing as intended in a number of cases. I also acted as a lab aide for a number of R&D projects, running tests and evaluating test results, as well as compiling test reports for managing R&D engineers.

Elevey, Inc.

Summer 2017

Hardware/Software Integration Intern

Toronto, ON, Canada

I designed a series of interactive Python scripts to automate production testing for the Domio Helmet Audio unit. This involved automatically connecting to the unit, playing audio through the unit, recording the units audio output, and comparing a DFT graph of the recorded data to a similar graph for the input data. Additionally, I played a major role in the design and assembly of a demo version of the Hearshot Coach product for use in testimonial film and consumer outreach.

COURSE PROJECTS

2020: Used Cadence Virtuoso to design a switched-capacitor gain stage in 65 nm CMOS for EE 240B. Implemented an optimized JPEG-like image compression algorithm and AFSK communication protocol in **Python** for EE 123.

2019: Developed a **C++** branch predictor based on the Gshare scheme for CS 152 and an automated strategy for a version of the game "Settlers of Catan" in **Python** for EECS 126. Implemented state feedback with a Luenberger observer to achieve a self-erecting inverted pendulum in EE C128.

2018: Designed a three-stage pipelined RISC-V CPU (with forwarding) in **Verilog** with audio and visual peripherals that could be written onto an FPGA for EECS 151, as well as an LCD Display Driver amplifier in 45 nm CMOS for EE 140 (in Cadence Virtuoso). Completed the design of an optimized 20 nm MOSFET for EE 130 and constructed a basic multi-stage amplifier in EE 105.

2017: Designed a database management system for CS 61B, voice-controlled robot car for EE 16B, and RISC-V assembly code simulator and CPU for CS 61C.

OUTREACH

Pioneers in Engineering

August 2016 - Present

Hardware Advisor, Former Sensor Team Project Manager

Berkeley, CA

Currently, I assist in mentoring new staff and leading engineering workshops for high school participants in PiE's robotics competitions. As a Project Manager, I directly supervised staff and was responsible for maintaining PCB CAD designs and facilitating assembly of sensor boards.