

Averal N. Kandala
Medical Device Researcher
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EDUCATION

University of California, Berkeley *August 2021 - Present*

Ph.D. in Electrical Engineering & Computer Sciences

Advisors: Professor Ali M. Niknejad, Professor M. Mekhail Anwar (UCSF)

University of California, Berkeley *June 2020 - August 2021*

M.S. in Electrical Engineering & Computer Sciences GPA: **4.0/4.0**

Thesis: *Harnessing Alpha Radiation to Power Miniaturized Implantable Medical Devices*

University of California, Berkeley *August 2016 - May 2020*

B.S. in Electrical Engineering & Computer Sciences GPA: **3.97/4.0**; Highest Honors

Selected Coursework: Advanced Analog ICs (A), Advanced Digital ICs (A+), DSP (A+), Semiconductor Device Physics (A+), Power Electronics (A), Computer Architecture (A), Probability & Random Processes (A), MEMS (A+), Feedback & Control Systems (A), Signals & Systems (A+)

RESEARCH

UCSF & Berkeley Wireless Research Center (BWRC) *June 2020 - Present*

Graduate Student Researcher

- Working under the supervision of Profs. Anwar and Niknejad to evaluate the efficacy of using alpha radiation from clinical radionuclides to power medical implants via phosphorescent light generation and light capture by photovoltaic arrays.
- This strategy is intended to power a chronic implantable “biohub” SoC acting as a substrate for sensor/stimulator chips and 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, I investigated the effect of “anchor loss” in ultrasonic energy harvesting by piezoelectric crystals at mm-scale, with the end goal of developing smaller medical implants for deeper implantability.
- Assembled a low-noise data acquisition and control system with Python GUI, writing Verilog descriptions for an FPGA signal controller and designing PCBs.

PUBLICATIONS

1. S. Sonmezoglu, A. Darvishian, K. Shen, M. J. Bustamante, **A. Kandala** and M. M. Maharbiz, “A Method and Analysis to Enable Efficient Piezoelectric Transducer-Based Ultrasonic Power and Data Links for Miniaturized Implantable Medical Devices,” in *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 2021.

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

- Lead TA responsible for administrative announcements and discussion section content.
- Led one discussion and one laboratory section per week, held regular office hours, 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

- Taught one discussion and one laboratory section per week, 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

- Answered questions and facilitated discussion in five office hours sections per week.

INDUSTRY

Samtec Optical Group

Summer 2018

Electrical Engineering Intern

Santa Clara, CA

- Worked on testing and verification within Firmware, Electrical R&D, and Optical R&D teams.
- Assembled list of testing criteria and designed a verification setup for optical cable firmware.
- Acted as a lab aide for R&D projects, running tests and compiling test reports.

Elevey, Inc.

Summer 2017

Hardware/Software Integration Intern

Toronto, ON, Canada

- Designed a series of interactive `Python` scripts to automate production testing for the Domio Helmet Audio unit.
- 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

2021: Implemented an all-digital PLL at schematic level (VCS, Virtuoso) for EE 241B.

2020: Designed a switched-capacitor gain stage in 65 nm CMOS at schematic level (Virtuoso) 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. 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 at schematic level (Virtuoso) for EE 140.

OUTREACH

Pioneers in Engineering

August 2016 - May 2020

Hardware Advisor, Sensor Team Project Manager

Berkeley, CA

- Mentored new staff and led engineering workshops for PiE's high school robotics competitions.
- Directly supervised staff and was responsible for maintaining PCB CAD designs (EAGLE) and facilitating assembly of sensor boards as Project Manager.