Averal N. Kandala
Wireless IC Design Researcher averal@berkeley.edu
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Education

University of California, Berkeley *August 2021 - Present*
Ph.D. in Electrical Engineering & Computer Sciences GPA: **4.0**/4.0
Advisor: Professor Ali M. Niknejad

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: ADCs (A+), RFICs (A+), Advanced Analog ICs (A), Advanced Digital ICs (A+), DSP (A+), Machine Learning (A), Optimization (A+), Power Electronics (A), Computer Architecture (A), Probability & Random Processes (A), MEMS (A+), Feedback & Control (A)

Research

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

- Taped out BASE-Hub, a wireless, implantable SoC providing chronic power, data storage, and communication for multiplexed "plug and play" sensing in X-FAB 180 nm.
- Journal publication submitted on the use of alpha radiation to power medical implants via phosphorescent light generation and subsequent light capture by photovoltaic arrays.

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 a `Python` GUI, writing `Verilog` descriptions for an FPGA signal controller and designing PCBs.

Course Projects

2023-**EE240C**: 14-bit, 30 MS/s Pipeline ADC Model @ 1.2 V, 72 dB DR, 65 dB SNDR in 45 nm.
2021-**EE241B**: Wide Tuning Range All-Digital Phase-Locked Loop w/ Fine Res. in Pred. 7 nm.
2020-**EE240B**: Switched-Capacitor Gain Stage with 64 dB DR @ 150 MHz. **EE123**: An optimized JPEG-like image compression algorithm and AFSK communication protocol in `Python`.
2019-**CS152**: `C++` branch predictor based on the Gshare scheme. **EEC128**: State feedback with a Luenberger observer to achieve a self-erecting inverted pendulum.
2018-**EECS151**: Three-stage pipelined RISC-V CPU (with forwarding) in `Verilog` with FPGA audio and visual peripherals. **EE140**: LCD Display Driver Amplifier in 45 nm.

Publications

1. R. Lall, K. Lee, S. Chopra, **A. Kandala**, M. Evans, Y. Seo, A. Niknejad, and M. Anwar, "Low cost, high temporal resolution optical fiber-based -photon sensor for real-time pre-clinical evaluation of cancer-targeting radiopharmaceuticals," in *Biosensors and Bioelectronics*, 2024.

2. 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

Advanced Analog Integrated Circuits (EE240B) *Spring 2024*
Graduate Student Instructor Evaluation: 6.8/7.0

- Primary discussion TA, also responsible for admin., homework content, and office hours.

Microelectronic Devices & Circuits (EE105) *Fall 2023, Spring 2020*
Graduate Student Instructor Evaluation: 6.68/7.0, 4.67/5.0

- Lead TA responsible for admin., homework, and discussion section instruction and content.

Great Ideas in Computer Architecture (CS61C) *Fall 2019*
Undergraduate Student Instructor Evaluation: 4.28/5.0

- Taught one discussion and one laboratory section per week, staffed office hours.

Industry

Qualcomm Atheros *Summer 2024*
RF/Analog IC Design Intern Santa Clara, CA

- Wireless product R&D in RFA team.

Samtec Optical Group *Summer 2018*
Electrical Engineering Intern Santa Clara, CA

- Assembled list of testing criteria and designed a verification setup for optical cable firmware.
- Assistant for optical link R&D projects, running BER and eye-diagram tests.

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 and facilitating assembly of sensor boards as Project Manager.