

Akshit Agarwal

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Education

- Sep 2023 - **California Institute of Technology**
Present MS in Electrical Engineering, GPA: 3.9
(Graduating Dec 2024) **Coursework** - Advanced Photonics and Lasers Lab, Robotics, Nanotechnology, Signals and Transforms
- Sep 2019 - **University of California San Diego**
Dec 2022 BS in Electrical Engineering with Minor in Economics, GPA: 3.981 with *Summa Cum Laude*
Academic Honors -
 - Henry G. Booker Award recipient
 - Tau Beta Pi Scholarship recipient for CA Psi Chapter
 - Tau Beta Pi Engineering Society member (available only to students in top 12.5% of the class)
 - Provost Honors for academic performance for 8 academic terms**Coursework** - Analog and Digital IC Design, RF Circuit Design, Feedback Systems Design and Analysis, LTI System Analysis, Control Theory, C/C++ programming, Electromagnetism

Technical Skills

Programming

Arduino C C/C++ Verilog System Verilog Python MATLAB

Design and Simulation

SolidWorks Eagle PCB Altium (PCAD) Spice Circuit Simulators Cadence Virtuoso Keysight ADS
Ansys HFSS

Research and Professional Experience

- Feb 2023 - **Research and Development Engineer, UCSD Qualcomm Institute**
Jul 2023 **Adviser:** Dinesh Bharadia
 - Developed a novel system for Angle of Arrival (AoA) estimation for RF signals in the sub 6 GHz spectrum
 - Utilized Ansys HFSS and MATLAB simulations for designing antenna arrays for wideband performance
- Feb 2021 - **Undergraduate Researcher, UCSD Energy-Efficient Microsystems Lab**
Dec 2022 **Adviser:** Patrick Mercier
 - **Wi-Fi backscatter Tag:**
 - Designed, implemented, and validated performance of a new architecture to improve range and wake-up times of Wi-Fi backscatter systems through a discretely implemented backscatter tag
 - Optimized power and area for layout design of hardware blocks on a custom Printed Circuit Board (PCB)
 - Utilized Verilog coding to implement multiple functional blocks like custom clocking and UART on FPGAs
 - Automated data collection process for validation and debugging, leading to faster validation process
 - **Bio-Fuel Cell (BFC) Touch sensor:**
 - Tested the use of BFCs as a power source for health and Bluetooth applications using a custom PCB
 - Harvested power from BFC to transmit sensor data through Bluetooth advertisement to minimize power

Projects

- Nov 2022 - **OTA Design**
Dec 2022 Designed a self-biased Operational Transconductance Amplifier (OTA) with given specifications of gain, unity gain bandwidth, gain margin and phase margin using Cadence Virtuoso

May 2022 - **Custom Architecture 8-Bit Adder**

Jun 2022 Designed a custom architecture 8-bit adder based on a variable-length carry increment adder with 4GHz maximum operational frequency using Cadence Virtuoso

Jan 2021 - **Chromotherapy Lighting System**

Mar 2021 Led a team of engineering students for an IEEE project to develop an IoT device that used chromotherapy and audio commands given by a user to change lighting conditions in a room to elevate user mood

Jan 2021 - **Baboons on the Move**

Jun 2021 Used Python algorithms to improve efficiency for detecting and mapping baboon movement in a video clip

Teaching and Mentoring Experience

Mar 2021 - **ECE Instructional Assistant, UCSD Jacob School of Engineering**

- Dec 2022
- Cultivated a comfortable learning environment for students for upper-division ECE course (ECE 101 – Linear System Fundamentals), received close to 100% recommendation over a period of six academic terms
 - Designed and graded assignments, conducted assessments and held office hours to facilitate learning

Publications

ISSCC 2023 S.-K. Kuo, M. Dunna, H. Lu, **A. Agarwal**, D. Bharadia, P.P. Mercier, "An LTE-harvesting BLE-to-WiFi Backscattering Chip for Single-Device RFID-like Interrogation" *IEEE International Solid-State Circuits Conference 2023*

arXiv M. Dunna, S.-K. Kuo, **A. Agarwal**, P.P. Mercier, D. Bharadia, "BeamScatter: Scalable, Deployable Long-Range backscatter communication with Beam-Steering" *Cornell University arXiv*