

Julian Maravilla

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Education

University of California, Berkeley

- Ph.D. in Electrical Engineering and Computer Sciences (In-Progress)
- Expected Graduation 2025

University of California, Santa Barbara

- B.S. in Electrical Engineering, Highest Honors
- College of Engineering Honor's, Tau Beta Pi Member
- Graduated June 2020

Honors and Awards

- 2021 National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP) Recipient
- Chancellor's Fellowship, University of California, Berkeley
- EECS Excellence Award, University of California, Berkeley

Skills

Software Experience (Advanced in all): Solidworks, Autodesk Applications, SPICE Simulations, Microsoft Office/Windows, Xilinx ISE, HFSS, SIMULINK, SILVACO

Programming Languages: C/C++, MATLAB, Verilog, Python

Relevant Skills: Antenna Design and Analysis, Semiconductor Design and Analysis, Circuit Design and Analysis, DSP, Imaging, FMCW RADAR, RF, Communications, and Machine Learning

Experience

Graduate Student Researcher, Arias Research Group/MikLab

University of California, Berkeley

June 2020 - Present

- Conducted research on MRI Receiver Coils
- Utilized printed electronic methods and materials to fabricate MRI Receiver Coils

Associate Analyst

Toyon Research Corporation; Goleta, CA

June 2018 - Present

- Analyzed and designed antennas and filters using HFSS
- Measured antennas and filters using a network analyzer
- Involved in Semiconductor design and analysis with clean room experience

Researcher, UCSB's Imaging Systems Lab

University of California, Santa Barbara

January 2019 - June 2020

- Conducted research on sensors and medical devices
- Processed the latest RADAR data to form new algorithms for image formation
- Designed a beamforming circular array as a stethoscope replacement

Projects

Body Conformal MRI Receiver Coils, UC Berkeley June 2020 - Present

- Implemented new fabrication techniques to utilize 3D printing and electroless plating to generate body conformal MRI receiver coils
- Applied shielded resonator theory to design and develop planar high impedance MRI transceiver coils

FedPAQ Algorithm for Distributed Learning, UCSB October 2019

- Generated a Python script that implements the Federated Learning algorithm with Periodic Averaging and Quantization to train on the CIFAR-10 dataset for demonstration
- Alleviated the communication bottleneck and scalability issues associated with Federated Learning
- Scalable for implementation on large datasets and many devices

Gallium Nitride Variable Capacitor, Toyon Research Corporation July 2018-June 2020

- Fabricated Gallium Nitride Variable Capacitors at UCSB's Nanofab Clean Room
- Measured C-V curves, and RF measurements of the devices up to 60GHz
- Aided in the design and simulation of the devices, goal is to produce high Q Variable Capacitors for operation in V and W bands.

Publications

LIDAR Collision Avoidance System with Audio Feedback For The Visually Impaired

Julian A. Maravilla, Haruka Shimada & Hua Lee, University of California, Santa Barbara
ITC Telemetry Conference 2019

Flexible Tunable Capacitor: A Variable Capacitor for Tuning Flexible/Thermoformed MRI Coils

Julian A. Maravilla, Karthik Gopalan, Ana C. Arias, & Michael Lustig, EECS, UC Berkeley
ISMRM 2021