**Ayush Paudel**

Highland Heights, Kentucky, USA • [paudela11.github.io](https://paudela11.github.io/) • [ayushpaudelmsu@gmail.com](mailto:ayushpaudelmsu@gmail.com) • (662)-701-8661

# Education

***Michigan State University*** East Lansing, MI

M.S. in Electrical and Computer Engineering. 2021 – 2023

***University of Mississippi*** University, MS

B.S. in Electrical Engineering. 2017 – 2021

Sally McDonnell Barksdale Honors College 2018 – 2021

# *Michigan State University*Experience

East Lansing, MI

City, State

**Graduate Student Research Assistant** 09/2021 – 05/2023

* Conducted literature reviews to gain a comprehensive understanding of the existing research and advancements in the field of high-power microwaves and plasmas.
* Collaborated with other research team members to brainstorm ideas, troubleshoot experimental setups, and exchange insights.
* Mentored a junior research assistant, providing guidance and support in their research activities by training them in simulation techniques, theoretical methods, and assisting them in their own research projects.
* Assisted in the development and improvement of theoretical models and numerical simulations related to high-power microwaves and plasmas.
* Utilized computational tools and software to simulate and analyze the behavior of such devices contributing to the theoretical understanding of the research topic.
* Engaged in academic conferences and workshops, presenting research findings and engaging in discussions with fellow researchers and experts in the field. This allowed for the exchange of ideas, receiving feedback, and building professional relationships within the academic and industry communities.
* Stayed updated with the latest advancements and breakthroughs in the field by regularly reading scientific journals, attending seminars, and participating in relevant webinars or online courses.
* Wrote multiple detailed reports summarizing the problem statement, the progress, and the results.

**Student Research Intern** 05/2021 – 08/2021

* Actively participated in learning opportunities, such as workshops or seminars, to enhance research skills and knowledge.
* Collaborated with peers and researchers to foster a positive and productive research environment.
* Shadowed a post-doctoral researcher to learn and contribute to the research methodologies, including computational and analysis techniques.
* Supported the presentation of research findings to funding groups as well as to parties in collaboration.

***University of Mississippi*** University, MS

**Community Assistant**  04/2018-05/2019

* Implemented community-building activities and programs to promote a positive residential experience for residents.
* Fostered a welcoming and inclusive environment by promoting diversity, respect, and understanding among residents.
* Provided guidance and support to residents by addressing inquiries, concerns, and conflicts in a timely and professional manner.
* Conducted regular floor or building meetings to communicate important information, policies, and upcoming events to residents.
* Responded to and documented incidents or emergencies, following established protocols and procedures.

**Projects**

**Design of an 8-bit 8T SRAM memory array** January 2023 - May 2023

* Designed a dual port 8T SRAM (Static Random Access Memory) memory cell connected in a custom 8 by 1 memory array using Cadence Virtuoso.
* Rigorously tested the model for the 8-bit read-and-write operations to verify the operation of the model.
* Performed timing analysis as well as Layout Vs Schematic (LVS) checks to verify the physical implementation of the design against the intended schematic representation.
* Documented the design process, including schematic diagrams, layout files, and design specifications, ensuring comprehensive documentation for future reference.

**Hardware Implementation of Advanced Encryption System (AES-128)** January 2021 - May 2021

* Collaborated with a team of two members to successfully design AES-128 encryption and decryption in Verilog, implementing the algorithm to ensure robust data security. The UART module was designed to facilitate secure communication between two FPGA (Field-Programmable Gate Array) boards.
* Synthesized a UART (Universal Asynchronous Receiver-Transmitter) module to establish communication between the FPGA boards. This module enabled the transfer of data and provided a reliable means of communication for the two FPGAs.
* Implemented the key generation algorithm for the AES-128 algorithm. This step involved writing Verilog code to generate cryptic keys that are used simultaneously during every step of data encryption and decryption.
* Assisted in the verification and testing of the AES encryption and decryption system. Conducted extensive testing to ensure that the system met design specifications and provided the expected level of security and reliability.
* Documented the design process, including Verilog code, block diagrams, and test results.
* Demonstrated the working functionality of the AES encryption and decryption design in front of a panel of professors. This presentation showcased the successful integration of the AES-128 algorithm, highlighting the secure data transfer capabilities of the implemented system.
* Ensured the successful completion of the project, meeting all design specifications and project goals.

**Audio Amplifier PCB Design** August 2020 - December 2020

* Successfully designed an audio preamplifier PCB circuit using discrete transistors as well as op amps in Altium Designer to compare the performance metrics.
* Explored the nuances of component selection to ensure optimal signal integrity and minimal noise interference, contributing to an enhanced audio output.
* Employed Altium Designer to translate conceptual designs into functional PCB layouts. This hands-on experience bolstered my proficiency in schematic creation, footprint selection, and routing strategies.
* Increased my proficiency in layout optimization within Altium Designer, strategically placing components and traces to minimize noise coupling, ensure signal integrity, and simplify assembly processes.

**Automatic Fish Feeder** January 2021 – May 2021

* Conceptualized and successfully engineered an automatic fish feeder system employing Arduino and C++.
* Integrated hardware components and software programming to create a solution that will reliably dispense food at a designated time.
* Successfully addressed technical challenges, such as power management, motor synchronization, and real-time clock synchronization.

# Community Involvement

**Guest Performer at Bangladesh Night,** *Michigan State University* **[2023]**

**Executive Member, NEPSA (Nepali Student Association),** *University of Mississippi* **[2018-2019]**

**Professional Involvement**

* **Poster Judge at Senior Design Day,** *Michigan State University, East Lansing, MI* 2023
* **Poster Presentation,** *Michigan Institute of Plasma Science(MIPSE), Ann Arbor, MI* 2023
* **Video Lecture,** *International Conference on Plasma Science(ICOPS), Virtual* 2022
* **Poster Presentation,** *International Vacuum Electronics Conference(IVEC), Monterey, CA* 2022
* **Poster Presentation,** *Michigan State University, East Lansing, MI* 2022

**Certificates**

* **Graduate Certificate in Computational Modelling**

Department of Computational Mathematics, Science & Engineering (CMSE) • 2023

* **Graduate Certificate in Semiconductor Manufacturing, Processing and Devices**

Department of Electrical and Computer Engineering (ECE) • 2023

* **Virtuoso Layout Design Basic**

Cadence Academic Network • 2023

**Publications**

* Paudel, P. Zhang, P. Wong, J. W. Luginsland and M. A. Franzi, "A Discrete Cavity Analysis for Coupled-

Cavity Travelling Wave Tubes," 2022 ICOPS, Seattle, WA, USA, doi:10.1109/ICOPS45751.2022.9813326

* Held the position of Vice President in NEPSA, an organization dedicated to promoting Nepali culture and fostering a sense of community among Nepali students.
* Coordinated and led various initiatives, including the organization of Nepal Night, a cultural event showcasing the traditions, music, and cuisine of Nepal.
* Oversaw event planning and logistics coordination, ensuring the successful execution of Nepal Night.
* Collaborated closely with the executive board and committee members, delegating responsibilities, and effectively managing team dynamics.
* Developed and maintained relationships with sponsors to secure resources and support for the event.