

SHALINI MANNA

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EDUCATION

Ph.D, Electrical and Computer Engineering (*Power Electronics*) *Fall 2025*
MS, Electrical and Computer Engineering (*Research*) *2021 - 2023*
University of Wisconsin-Madison (*Power Electronics, WEMPEC*) **GPA-3.9/4.0**

Bachelor of Technology, Electrical Engineering *2017 –2021*
Indian Institute of Engineering Science and Technology, Shibpur **GPA-3.84/4.0(9.07/10)**

RESEARCH & WORK EXPERIENCE

Ph.D. Research Topic – High-Frequency Matrix Converters *Sep’25*

GE Research (Aerospace) – Niskayuna, New York *Aug’23 – Aug’25*

- Edison Engineering Development Program (EEDP): [Rotation 1 – Power Electronics | 2 – Microelectronics]

Rotation 1 – **Power Electronics** (*Aug’23 – Jun’24*)

- Designed various architectures of EMI filters for 3L-ANPC optimizing for least volume, weight
- Implemented controls algorithms on a DSP + FPGA platform synchronizing 3L-ANPC paralleled converters to minimize circulating current achieving < 8 ns delay between switches; successful in tuning individual delays
- Design, analog control of LLC converter and associated magnetics – winding patterns, thermal management

Rotation 2 – **Microelectronics** (*Jun’24 - present*)

- Developed firmware (FPGA + serial communication) for ultra-low power MEMS gyroscope system
- Characterizing system to understand available control handles to maximize SNR (quadrature / frequency tuning etc.) and associated sensitivity; subsequently evolving firmware to add functionality

Independent R&D (*Oct’24 – present*)

- Design and development of efficient auxiliary circuit to enable soft-switching of SiC modules

DC-DC Multilevel converters – WEMPEC, UW Madison (*) *Jan’22 – May’23*

- MS Research: Designed, analyzed, simulated and performed hardware verification of 3-level asymmetric voltage stacked topology with closed-loop control
- Novel modelling method of multilevel converters, applicable for higher no.of levels
- Frequency response analyzer verified modelling of DC-DC converter

Milwaukee Tool – NPD Electrical Engineering Intern *Jun’22 – Aug’22*

- Lighting & Lifestyle team; Compact “Modular LED board” in constant current control mode Buck chopper
- Performed thermal, functional tests on prototype, cost comparison between types of PCB for LEDs
- Verified industry standards compliance (sleep-mode power, emissions, voltage decay) for upcoming lighting products (400 V level)

PEGO Octopus : Power electronics control board *Sep’21 – Mar’22*

- Developed housekeeping and state machine embedded C code for rapid prototyping power electronics
- Register-level implementation (ARM Cortex M3) to interface power and control circuit PCBs

B.Tech Final Year Thesis Project (^)

Sep'20 - May'21

- Title - "Investigations on Wide Bandgap Devices Based High-Frequency Power Converter"
- Designed compact 4-layer gate driver card and DPT board using Altium Designer
- Tested synchronous buck, boost configurations with ZVS at frequencies 100 kHz to 1 MHz
- Performed a simple EMI analysis to design an input filter to meet CISPR-22(class A) specifications

PUBLICATIONS

- S. Manna and G. Venkataramanan, "Dynamic modeling and control of unbalanced dc to three-level dc converters," *2023 IEEE Energy Conversion Congress and Exposition (ECCE)*, Nashville, TN, USA, 2023 (*)
- A. Kar, S. Manna, G. Banerjee and M. Sengupta, "Design, Analysis, Fabrication & Testing of SiC Device based High Frequency Synchronous DC-DC Converters," *2021 National Power Electronics Conference (NPEC)*, Bhubaneswar, India, 2021 (^)
- A. Kar, S. Manna, M. Sengupta and G. Banerjee, "Design, Fabrication and Testing of gate driver and Double Pulse Test board for SiC MOSFETs," *2021 National Power Electronics Conference (NPEC)*, Bhubaneswar, India, 2021 (^)

AWARDS

- 1st place (team), 2022 IEEE/AIAA ITEC+EATS Battery State of Charge Estimation Student Competition
- Grainger Award, UW Madison, Fall 2025

SKILLS

Electrical Engineering Software: MATLAB, Simulink, PSIM, LTSpice, PLECS, OrCAD PSpice, Altium Designer, ANSYS- (PEXprt, SIWave), mikroC, MPLABX IDE, Quartus Prime

Programming Languages / Documentation: C, C++, Python, Julia, Embedded C (microcontrollers 8085/86, 8081, PIC18F series, ARM Cortex M3, ATMEL), SystemVerilog, VHDL, LaTeX