ANTU ROY
NIT CALICUT

+91 8116375765
vandemataram15aug1947@gmail.com
Portfolio Website
LinkedIn Profile
GitHub Profile

Profile

Passionate and Dedicated Power Electronics Hardware Engineer with a Strong Focus on Advanced Power Electronics Control, Their Practical Hardware Implementation (HI) and Embedded Firmware Development. An Extensive Strong Experience in Designing Single-Phase and Three-Phase Hardware Inverter Circuits, Implementing Control Schemes with PI, PR Controllers and FOC, as well as PLL Synchronization for Precision Grid Integration. Practiced in Both SPWM and SVPWM Techniques for High-Performance Inverter Operation. Key Focus on Optimizing the Renewable Energy Systems, Particularly Hardware Implementation of Grid-Connected PV Solar Inverters and in the Real-Time Control by ePWM Generation and ADC Integration on Precision Microcontrollers Like the TMS320F28379D, Along with SCI/UART and CAN Communication Protocols for Robust Data Exchange and System Coordination. Familiar with Basic Hardware-in-the-Loop (HIL) Using Real-Time (RT) Simulators. Skilled in Using Industry-Standard Tools, Including MATLAB/Simulink, PLECS, LTspice, PSIM, Altium Designer, PSpice, Proteus, Along with the LaTeX for Producing Clear Professional Technical Reports, Research Papers, and Presentations. Driven to Contribute actively to Innovative Organizations by Advancing Power Conversion, Renewable Energy, and Control Engineering Systems.

Education

National Institute of Technology Calicut, Kozhikode, Kerala **2023-2025**
Master of Technology in Power Electronics *CGPA: 7.77*

Regent Education and Research Foundation, Barrackpore, West Bengal **2016-2020**
Bachelor of Technology in Electrical Engineering *CGPA: 7.58*

Asannagar High School (H.S), Krishnagar, Nadia, West Bengal **2014-2016**
West Bengal Council of Higher Secondary Education *Percentage: 71.20*

Asannagar High School (H.S), Krishnagar, Nadia, West Bengal **2012-2014**
West Bengal Board of Secondary Education *Percentage: 80.14*

Notable Hardware Projects

M.Tech Projects

Design & Control of Single-Stage Grid-Connected Inverter for 1-φ PV System | *CCS* Monsoon 2025

- *Designed, Modeled and Simulated the Inverter Using PLECS and MATLAB/Simulink, While Implementing MPPT and Grid Synchronization Algorithms on TMS320F28379D for Effective Power Conversion*
- *Optimized Inverter Control Techniques on TMS320F28379D to Ensure Superior Conversion Efficiency and Operation While Assessing Performance Across Diverse Environmental, Grid and Operational Scenarios*

Field-Oriented Control of Three-Phase Induction Motor Using SVPWM Technique | *CCS* Winter 2025

- *Developed, Analyzed and Simulated FOC-Based Control Techniques for a Three-Phase Induction Motor in MATLAB/Simulink, Integrating SVPWM Implementation on TMS320F28379D for Enhanced Motor Control*
- *Designed and Refined Control Strategies on TMS320F28379D to Deliver Accurate Speed Control, Achieving Optimal Efficiency and Stable Dynamic Behavior Across Different Load Scenarios*

Design & Analysis of 3-φ Inverter Using Sinusoidal ePWM Modulation Technique | *CCS* Winter 2024

- *Designed and Analyzed Using PLECS and MATLAB/Simulink, Implemented Hardware on TMS320F28379D Considering Power Electronics Principles and Circuitry for an Open-Loop Three-Phase Inverter*
- *Optimized ePWM Control Algorithms on TMS320F28379D to Achieve Efficient and Smooth Sinusoidal Output Waveforms and Evaluated The Inverter's Performance Under Various Operating Conditions*

Control of DC Motor Using ePWM on the TMS320F28379D Microcontroller |*CCS* Monsoon 2023

- *Designed and Optimized PWM Control Algorithms for Precise Motor Speed Control and Efficient Performance*
- *TMS320F28379D is Utilized to Implement Precise Control by Modulating the Duty Cycle of the PWM Signals*

Integration of SOC and SOH Estimation for Li-ion Battery Management |*Proteus* Monsoon 2023

- *Implemented Estimation Algorithm in Hardware for Accurate Assessment of SOC, SOH and DOD Parameters*
- *Integrated the Estimation Techniques Into Hardware Systems Enables for Real-Time Monitoring and Analysis*

B.Tech Projects

Optimal Operational Scheduling of a Grid Connected System Based on DSM |*MATLAB* Winter 2020

- *Solved the Demand Side Management Problem by Considering of a Grid Connected Network by Load Shifting*
- *Reduced the Supply Side's Cost and Increased the Demand Side's Revenue in a Grid Using the DE Algorithm*

Overload Protection, Monitoring and Load Shifting of a 3-Phase Transformer |*Proteus* Spring 2019

- *Implemented Real-Time Monitoring to Track Voltage and Current Levels of the Transformer's Performance*
- *Optimized Efficiency and Load Balance Throughout Transformer Phases by Using Load Shifting Techniques*

Technical Strengths

Programming:	*MATLAB/Simulink, Code Composer Studio (CCS) and Embedded C*
Embedded Systems and Control: :	*SCI/UART and CAN Communication and HIL Using RT Simulators*
Circuit Design:	*LTspice, PSpice, TINA-TI, SIMetrix, PSIM, Multisim and Proteus*
PCB Design:	*Altium Designer, High-End PCB Design and Schematic Capture*
Components Selection:	*MOSFETs, IGBTs, Diodes, Gate Drivers and Snubber Circuits*
Document Creation:	*MS Office, MS Visio, LaTex, Google Docs and Adobe Photoshop*

Hardware Experience

Advanced Power Electronics

- *Designed and Implemented Buck, Boost, and Buck-Boost Converters for High Efficiency Power Conversion*
- *Developed 1-Phase and 3-Phase Inverters Using SPWM Technique to Voltage Control and Output Performance*

Digital Control and Embedded Systems

- *Developed Waveform Generation Techniques Including Square Waves, ePWM, and SPWM Signal and Control*
- *Implemented Digital Controllers for Real-Time Embedded Systems Using Programmable System on a Chip*

Areas of Interest

- *Design and Control of Inverters for Photovoltaic (PV) Systems, PLL Grid Integration, and MPPT Algorithms*
- *Design and Control of DC-DC Converters, Advanced Control Techniques, and Power Converter Optimization*
- *Embedded Systems for Power Electronics Projects, Including TMS320F28379D Microcontroller Programming*
- *Electric Vehicle Powertrain Management, Battery Systems, Charging Infrastructure, and Energy Efficiency*

Training and Certificates

Vocational Training Program

West Bengal State Electricity Transmission Company Limited (WBSETCL) Winter 2020

- *Trainee was Acquainted with the Electrical Operation & Maintenance and Functioning of Different Equipment Like Power Transformer, Current Transformer, Potential Transformer, Circuit Breaker, Lightning Arrestor Productive Relays, Conductors, Isolators, Transmission Towers, Electrical Safety Procedure & Devices, etc.*

West Bengal State Electricity Distribution Company Limited (WBSEDCL) Winter 2020

- *Electrical Operation & Maintenance Activities of Distribution Line & Sub Station Upto 33 kV of WBSEDCL*