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# ACADEMIC PROJECTS 2026-2027

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- Electric Vehicles (EV)
- MATLAB Simulink
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**2026– 2027 EEE POWER SYSTEMS IEEE TITLES**

| S.NO | TITLE | DOMAIN |
|---|---|---|
| 01 | **PQ Improvement of Four Wire Distribution Grid Based Dual Stage Solar PV Array Integrated UPQC**<br><br>**Objective:** *The main objective of this paper is to develop a dual-stage solar PV array integrated four-wire Unified Power Quality Conditioner (UPQC) to enhance power quality in distribution grids. The proposed system mitigates voltage sag/swell, harmonics, reactive power, neutral current, and load imbalance while maintaining balanced load voltage and sinusoidal grid currents under varying operating conditions.* | Solar Power Generation |
| 02 | **A Hybrid PV-Wind Single-Phase Transformer-Less Grid-Connected Cascaded NPC Inverter Minimizing Leakage Currents**<br><br>**Objective:** *To design and simulate a hybrid PV-wind transformer-less grid-connected cascaded NPC inverter in MATLAB/Simulink for minimizing leakage current, improving power quality, reducing THD, and enhancing grid integration performance.* | Solar Power Generation |
| 03 | **A Reconfigurable Modular Topology for PV Converter to Improve Overcurrent Capacity and Flexibility**<br><br>**Objective:** *To develop and simulate a reconfigurable modular photovoltaic converter that improves overcurrent capability, operational flexibility, and grid support performance under varying irradiance and grid disturbances using MATLAB/Simulink.* | Solar Power Generation |
| 04 | **Adaptive Virtual Impedance Control for Series Active Compensator to Improve PV Power Injection in Distribution Networks**<br><br>**Objective:** The main objective of this project Develop an adaptive virtual impedance-controlled Series Active Compensator to mitigate distribution network overvoltage, maximize photovoltaic power injection, minimize converter capacity and feeder losses, and improve renewable energy utilization | Solar Power Generation |

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| **05** | **An Adaptive Model Predictive Control Scheme for Two-Stage Single-Phase Grid-Connected Photovoltaic System Using Variable Forgetting Factor Recursive Least Squares Estimator**<br>**Objective:** The main objective of this project Develop an adaptive virtual impedance-controlled Series Active Compensator to mitigate distribution network overvoltage, maximize photovoltaic power injection, minimize converter capacity and feeder losses, and improve renewable energy utilization | Solar Power Generation |
| **06** | **Comparison of Hard and Soft Switching Cascaded DC–DC Boost Converters for PV Applications**<br>**Objective:** *The main objective of this project to develop an MPPT-based active soft-switching cascaded DC–DC boost converter that achieves high voltage gain, minimizes switching losses, improves efficiency, and enhances PV power extraction under varying irradiance conditions.* | Solar Power Generation |
| **07** | **Coordinated Control of VSI Dead Angle β and Isolating Transformer Tap Changer for High Power Grid Connected Solar PV Based Power Generation**<br>**Objective:** *The main objective of this project to develop a coordinated control strategy for VSI dead angle (β) and transformer tap changer that minimizes harmonic distortion, improves grid power quality, and ensures efficient grid-connected solar photovoltaic power generation.* | Solar Power Generation |
| **08** | **Design of MPPT Controller for Solar Photovoltaic Emulator**<br>**Objective:** *The main objective of this project to design a PI-based Maximum Power Point Tracking (MPPT) controller for a solar photovoltaic emulator that accurately extracts maximum power under varying irradiance and temperature conditions.* | Solar Power Generation |
| **09** | **Design of Single-Phase PV Inverter with Self-Reactive Power Compensation**<br>**Objective:** *The main objective of this project to design a single-phase PV inverter with self-reactive power compensation that improves power factor, minimizes reactive power, and maximizes solar energy extraction using an enhanced MPPT control strategy.* | Solar Power Generation |

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| **10** | **Droop-Based Hierarchical Control for Power-Sharing and Voltage Balancing in Bipolar DC Microgrids**<br>**Objective:** *The main objective of this project to develop a droop-based hierarchical control strategy for bipolar DC microgrid that achieves accurate power sharing, voltage restoration, voltage balancing, and ESS SoC balancing under varying load conditions.* | Solar Power Generation |
| **11** | **Enhanced Grid Current Control Using Novel Adaptive Filter EFOLMS in a Hybrid Wind–PV–Battery System with Nonlinear Load Compensation**<br>**Objective:** *To develop an Enhanced Fractional-Order Least Mean Square (EFOLMS) adaptive filter for accurate extraction of the fundamental grid current in a hybrid Wind–PV–Battery system.* | Solar Power Generation |
| **12** | **Enhanced Grid Integration of Solar Photovoltaic using Battery Energy Storage**<br>**Objective:** *To develop a grid-connected Solar PV–Battery Energy Storage System (BESS) that smooths PV power fluctuations and ensures stable, reliable, and high-quality power injection into the utility grid.* | Solar Power Generation |
| **13** | **Reconfigurable Non-Isolated DC-DC Converter for DC Microgrid Applications**<br>**Objective:** *To develop a reconfigurable non-isolated DC–DC converter for DC microgrid applications that supports flexible boost, buck, and bidirectional power conversion with enhanced plug-and-play capability and reliable integration of renewable energy sources.* | Solar Power Generation |
| **14** | **Modeling and Simulation of Solar Powered EV Charging Circuit for Smart Grid Integration in G2V and V2G Modes**<br>**Objective:** *The main objective of this work is to design and simulate a solar-powered EV charging circuit integrated with the smart grid for both Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G) modes using MATLAB/Simulink. The study aims to maximize the utilization of solar energy, enable bidirectional power flow between the EV battery and the utility grid, and improve overall energy management.* | Solar Power Generation |
| **15** | ***Next-Generation Control Strategy for Renewable Microgrids with Bidirectional Battery Support*** | Solar Power Generation |

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| | ***Objective**: The main objective of this work is to develop a next-generation control strategy for a renewable hybrid microgrid consisting of a Solar Photovoltaic (SPV) system, Wind Energy Conversion System (WECS), and Battery Energy Storage System (BESS). The proposed system employs a Generalized Fourth-Order Filter (GFOF)-based Voltage Source Converter (VSC) to improve power quality, regulate the Common Coupling Point (CCP) voltage, suppress harmonics, and ensure effective power sharing among renewable energy sources.* | |
| **16** | **Optimized PV Converter Fed HAPF for Improved Power Quality**<br><br>**Objective:** *The main objective of this work is to develop a solar PV-fed Hybrid Active Power Filter (HAPF) using a high-gain Interleaved Luo (I-Luo) converter to improve power quality in distribution systems. The study aims to maximize solar power extraction using a Class Topper Optimization (CTO)-based MPPT algorithm, while employing a Decoupled Neural Network (DNN) for accurate reference current generation and harmonic compensation.* | Solar Power Generation |
| **17** | **Parallel Distributed Energy Generation Based Microgrid Incorporating Reactive Power Sharing and Grid Synchronisation Capability**<br><br>**Objective**: *The main objective of this work is to develop a parallel distributed energy generation (DEG)-based microgrid capable of operating in both grid-connected and standalone modes while ensuring seamless grid synchronization and effective reactive power sharing among distributed energy resources. The proposed system integrates a Solar PV array, Wind Energy Conversion System (WECS), and Battery Storage System (BSS) using parallel Voltage Source Converters (VSCs).* | Solar Power Generation |
| **18** | **Performance Enhancement of Solar PV Integrated Ev Charging Stations**<br><br>**Objective:** *The main objective of this work is to develop a Solar PV integrated EV charging station employing a Hybrid Energy Storage System (HESS) consisting of a lithium-ion battery and a supercapacitor to improve charging performance and energy management. The proposed system aims to maximize solar energy utilization through a Constant Voltage (CV)-based MPPT boost converter, maintain DC-link voltage stability, reduce battery stress, minimize grid dependency.* | Solar Power Generation |
| **19** | **Power Quality Enhancement in Grid Connected Renewable Energy Microgrids with Energy Storage** | Solar Power Generation |

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| | **Objective:** *The main objective of this project is to improve power quality in grid-connected renewable energy microgrids by integrating advanced custom power devices and energy storage systems to achieve voltage regulation, harmonic mitigation, reactive power compensation, and stable operation under varying operating conditions.* | |
| **20** | **Power Quality Improvement in Grid-Tied Solar PV Systems using d–q Control-based Shunt Active Power Filter**<br><br>**Objective:** *To improve power quality in grid-connected solar photovoltaic systems by integrating a d–q reference frame-controlled Shunt Active Power Filter that suppresses harmonics, regulates the DC-link voltage, compensates reactive power, and ensures compliance with IEEE-519 standards.* | Solar Power Generation |
| **21** | **Power Quality Improvement of a Standalone Microgrid Supplied by Hybrid PV-Wind-Battery System**<br><br>**Objective:** *To develop a standalone hybrid PV–wind–battery microgrid that enhances power quality by maintaining stable voltage and frequency, minimizing harmonic distortion, and ensuring reliable power supply under varying renewable generation and load conditions through effective energy management and control strategies* | Solar Power Generation |
| **22** | **Hybrid Renewable Energy System Incorporated with Shunt Active Power Filter with Improved Control Technique for Power Quality Mitigation**<br><br>**Objective:** *To develop a Hybrid Renewable Energy System (HRES) integrated with a Shunt Active Power Filter (SAPF) using an MSRF-FLC-AHCC control strategy for mitigating harmonics, regulating DC-link voltage, and improving overall power quality under nonlinear load conditions.* | Solar Power Generation |
| **23** | **Seamless Power Transfer of Bidirectional Converters in Microgrids Applications**<br><br>**Objective:** *To develop a communication-free control strategy for bidirectional DC–DC converters that enables seamless power transfer between charging and discharging modes, ensuring uninterrupted power supply and stable operation in hybrid AC–DC microgrids.* | Solar Power Generation |
| **24** | **Voltage Profile Enhancement in a Solar Wind–Battery Connected Hybrid Power System using Dynamic Voltage Restore**<br><br>**Objective:** *To develop a hybrid solar–wind–battery power system integrated with a Dynamic Voltage Restorer (DVR) that enhances* | Solar Power Generation |

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| | *voltage stability, improves power quality, and maintains reliable grid operation under renewable energy and load variations.* | |
| **25** | **WRLS-Driven Robustness Enhancement of Nine-Switch Unified PV-DVR Systems Under Unbalanced Grid Conditions**<br><br>**Objective:** *To enhance the robustness of a unified PV-DVR system based on a nine-switch inverter by employing WRLS-assisted sequence estimation for maintaining nominal load voltage under asymmetrical grid fault conditions.* | Solar Power Generation |
| **26** | **A Hybrid PV-Wind Single-Phase Transformer-Less Grid-Connected Cascaded NPC Inverter Minimizing Leakage Currents**<br><br>**Objective**: *To design and simulate a hybrid PV-wind transformer-less grid-connected cascaded NPC inverter in MATLAB/Simulink for minimizing leakage current, improving power quality, reducing THD, and enhancing grid integration performance.* | Wind Power Generation |
| **27** | **Hybrid Integration of Fuel Cells and DFIG for Distributed Generation with Enhanced Power Quality**<br><br>**Objective:** *To develop a hybrid distributed generation system integrating a DFIG-based wind energy conversion system, proton exchange membrane fuel cell, and battery energy storage using an LF-GSRS-based grid-side controller to enhance power quality, improve harmonic suppression, and ensure stable power coordination under varying operating conditions.* | Wind Power Generation |
| **28** | **Advanced Control and Integration of Fuel Cell with Doubly Fed Induction Generators for Sustainable Power Generation**<br><br>**Objective:** *The main objective of this project to develop an M-ATLHCAF-controlled DFIG–fuel cell–battery hybrid renewable energy system that improves power quality, coordinates energy sources, minimizes harmonics, regulates DC-link voltage, and enhances dynamic grid stability.* | Wind Power Generation |
| **29** | **An Enhanced Adaptive Filter Controlled BES-Wind Driven DFIG Based Microgrid**<br><br>**Objective:** *The main objective of this to develop a UEHCRA filter-controlled DFIG-based wind microgrid with battery energy storage that enhances power quality, ensures seamless synchronization, reduces harmonics, and provides reliable power under grid-connected and islanded conditions.* | Wind Power Generation |
| **30** | **DC-Link Voltage Control for a Hybrid Generator-Based Wind Turbine System** | Wind Power Generation |

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| | **Objective:** *The main objective of this project to develop a Hybrid Generator-based Wind Turbine control scheme that regulates DC-link voltage independently of grid conditions, improves MPPT performance, eliminates PLL, and enhances system stability and efficiency.* | |
| **31** | **Droop-Based Hierarchical Control for Power Sharing and Voltage Balancing in Bipolar DC Microgrids**<br><br>**Objective**: *The main objective of this project to develop a droop-based hierarchical control strategy for bipolar DC microgrid that achieves accurate power sharing, voltage restoration, voltage balancing, and ESS SoC balancing under varying load conditions.* | Wind Power Generation |
| **32** | **Enhanced Grid Current Control using Novel Adaptive Filter EFOLMS in a Hybrid Wind–PV Battery System with Nonlinear Load Compensation**<br><br>**Objective**: *To develop an Enhanced Fractional-Order Least Mean Square (EFOLMS) adaptive filter for accurate extraction of the fundamental grid current in a hybrid Wind–PV–Battery system.* | Wind Power Generation |
| **33** | **Fault Ride-Through Capability Enhancement of DFIG-Based Wind Power Plants Using BESS-STATCOM**<br><br>**Objective:** *To enhance the Fault Ride-Through (FRT) capability of DFIG-based wind power plants using a coordinated Battery Energy Storage System (BESS) and STATCOM, thereby improving voltage stability, reducing overcurrent's, and ensuring reliable grid operation during symmetrical and asymmetrical grid faults.* | Wind Power Generation |
| **34** | **Finite Control Set MPC for DFIG Direct Power Control in Distorted Grids**<br><br>**Objective:** *To propose a Finite Control Set Model Predictive Control (FCS-MPC) strategy integrated with DDSRF-PLL for DFIG direct power control, enhancing synchronization, reducing harmonic distortion, and improving dynamic performance under distorted grid-voltage conditions.* | Wind Power Generation |
| **35** | **Hybrid Renewable Energy System Incorporated with Shunt Active Power Filter with Improved Control Technique for Power Quality Mitigation**<br><br>**Objective**: *To develop a Hybrid Renewable Energy System (HRES) integrated with a Shunt Active Power Filter (SAPF) using an MSRF-FLC-AHCC control strategy for mitigating harmonics, regulating DC-link voltage, and improving overall power quality under nonlinear load conditions.* | Wind Power Generation |

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| **36** | **Improved Control Approaches for Dynamic Voltage Restoration in Doubly Fed Induction Generator-Based Wind Turbines**<br><br>**Objective*:*** *To improve voltage restoration and power quality in DFIG-based wind turbine systems by integrating a Dynamic Voltage Restorer (DVR) with advanced intelligent control techniques for effective voltage sag compensation and enhanced fault ride-through capability.* | Wind Power Generation |
| **37** | **Improving Power Quality and Minimizing Harmonic Distortion in Grid-Connected Power Electronics with Power Filters**<br><br>**Objective:** *To improve power quality and minimize harmonic distortion in grid-connected renewable energy systems by developing a photovoltaic-assisted Unified Power Quality Conditioner (UPQC) using a 27-level multilevel inverter and intelligent control techniques for voltage and current compensation***.** | Wind Power Generation |
| **38** | **Next-Generation Control Strategy for Renewable Microgrids with Bidirectional Battery Support**<br><br>**Objective:** *The main objective of this work is to develop a next-generation control strategy for a renewable hybrid microgrid consisting of a Solar Photovoltaic (SPV) system, Wind Energy Conversion System (WECS), and Battery Energy Storage System (BESS). The proposed system employs a Generalized Fourth-Order Filter (GFOF)-based Voltage Source Converter (VSC) to improve power quality, regulate the Common Coupling Point (CCP) voltage, suppress harmonics, and ensure effective power sharing among renewable energy sources.* | Wind Power Generation |
| **39** | **Parallel Distributed Energy Generation Based Microgrid Incorporating Reactive Power Sharing and Grid Synchronization Capability**<br>**Objective:** The main objective of this work is to develop a parallel distributed energy generation (DEG)-based microgrid capable of operating in both grid-connected and standalone modes while ensuring seamless grid synchronization and effective reactive power sharing among distributed energy resources. The proposed system integrates a Solar PV array, Wind Energy Conversion System (WECS), and Battery Storage System (BSS) using parallel Voltage Source Converters (VSCs). | Wind Power Generation |
| **40** | **PLL-Less Minimal Structure Control for Four-Quadrant H-Bridge Converters** | Wind Power Generation |

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| | **Objective:** *The main objective of this project is to develop a low-complexity PLL-less control strategy for a four-quadrant H-Bridge converter that minimizes computational requirements while ensuring accurate DC-link voltage regulation, bidirectional power flow, reactive power control, and stable grid operation under normal and disturbed grid conditions***.** | |
| **41** | **Power Quality Enhancement in Grid Connected Renewable Energy Microgrids with Energy Storage**<br><br>**Objective:** *To develop a standalone hybrid PV–wind–battery microgrid that enhances power quality by maintaining stable voltage and frequency, minimizing harmonic distortion, and ensuring reliable power supply under varying renewable generation and load conditions through effective energy management and control strategies.* | Wind Power Generation |
| **42** | **Power Quality Improvement of a Standalone Microgrid Supplied by Hybrid PV-Wind-Battery System**<br><br>**Objective:** *The primary objective of this paper is to develop a hybrid PV–Wind–Battery standalone microgrid with an efficient control strategy that enhances power quality and maintains energy balance under varying renewable generation and load conditions.* | Wind Power Generation |
| **43** | **Power Quality Improvement using E-SOGI Controlled DSTATCOM with Wind Generation**<br><br>**Objective:** *The main objective of this paper is to develop an Enhanced Second-Order Generalized Integrator (E-SOGI) controlled DSTATCOM with a frequency controller to improve power quality in a wind-integrated distribution system. The proposed controller minimizes voltage and frequency disturbances, reduces harmonic distortion, and enhances system stability under balanced, unbalanced, and fault conditions.* | Wind Power Generation |
| **44** | **Reconfigurable Non-Isolated DC-DC Converter for DC Microgrid Applications**<br><br>**Objective:** *To develop a reconfigurable non-isolated DC–DC converter for DC microgrid applications that supports flexible boost, buck, and bidirectional power conversion with enhanced plug-and-play capability and reliable integration of renewable energy sources.* | Wind Power Generation |
| **45** | **Voltage Profile Enhancement in a Solar Wind–Battery Connected Hybrid Power System using Dynamic Voltage Restore**<br><br>**Objective:** *To develop a hybrid solar–wind–battery power system integrated with a Dynamic Voltage Restorer (DVR) that enhances* | Wind Power Generation |

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| | *voltage stability, improves power quality, and maintains reliable grid operation under renewable energy and load variations.* | |
| **46** | **Design of Single-Phase PV Inverter with Self-Reactive Power Compensation**<br><br>**Objective:** *The main objective of this project to design a single-phase PV inverter with self-reactive power compensation that improves power factor, minimizes reactive power, and maximizes solar energy extraction using an enhanced MPPT control strategy.* | Power Quality |
| **47** | **A T-STATCOM converter structure synergistically combining IGBTs and SiC-MOSFETs**<br><br>**Objective:** *To design and simulate a hybrid T-STATCOM using a three-level NPC converter and two-level SiC-MOSFET converter in MATLAB/Simulink for reactive power compensation, harmonic reduction, and improved grid voltage regulation.* | Power Quality |
| **48** | **A Current Feed-Forward Method with Enhanced PLL Characteristics for Grid-Connected Inverter Under Weak Grid**<br><br>**Objective:** *To develop and simulate a current feed-forward control method with an enhanced phase-locked loop for a grid-connected inverter in MATLAB/Simulink to improve current quality, system stability, and weak grid performance.* | Power Quality |
| **49** | **A Novel Flexible Power Control for Three-Phase Buck Rectifier Under Unbalanced Grid Voltages and Wide Grid Frequency**<br><br>**Objective:** *To develop a flexible power control strategy for a three-phase buck rectifier that maintains stable active and reactive power, improves voltage regulation, minimizes current distortion, and ensures reliable operation under unbalanced grid voltages and wide grid frequency variations.* | Power Quality |
| **50** | **A Reconfigurable Modular Topology for PV Converter to Improve Overcurrent Capacity and Flexibility**<br><br>**Objective:** *To develop and simulate a reconfigurable modular photovoltaic converter that improves overcurrent capability, operational flexibility, and grid support performance under varying irradiance and grid disturbances using MATLAB/Simulink.* | Power Quality |
| **51** | **Achieving Reduced Sizing for Shunt Active Power Filters: A Design Leveraging Load Impedance Analysis and Conservative Power Theory** | Power Quality |

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| | **Objective:** *The main objective of this project to develop a reduced-rating Shunt Active Power Filter using load impedance optimization and Conservative Power Theory for efficient harmonic compensation and improved power quality* | |
| **52** | **Adaptive Virtual Impedance Control for Series Active Compensator to Improve PV Power Injection in Distribution Networks**<br><br>**Objective:** *The main objective of this project Develop an adaptive virtual impedance-controlled Series Active Compensator to mitigate distribution network overvoltage, maximize photovoltaic power injection, minimize converter capacity and feeder losses, and improve renewable energy utilization* | Power Quality |
| **53** | **An Enhanced Adaptive Filter Controlled BES-Wind Driven DFIG Based Microgrid**<br><br>**Objective:** *The main objective of this To develop a UEHCRA filter-controlled DFIG-based wind microgrid with battery energy storage that enhances power quality, ensures seamless synchronization, reduces harmonics, and provides reliable power under grid-connected and islanded conditions.* | Power Quality |
| **54** | **DBLN-Based IC-DSTATCOM for Power-Line Conditioning in the Power Distribution System**<br><br>**Objective:** *The main objective of this project To develop a DBLN-based IC-DSTATCOM for improving power quality by reducing harmonic distortion, enhancing power factor, regulating voltage, and providing efficient power-line conditioning in power distribution systems.* | Power Quality |
| **55** | **Decoupled Per-Phase Control of a Four-Leg Grid-Feeding Inverter for Voltage Unbalance Mitigation in Low-Voltage Networks**<br><br>**Objective:** *The main objective of this project To develop a decoupled per-phase control strategy for a four-leg grid-feeding inverter that mitigates voltage unbalance, enables independent phase current control, and improves power quality in low-voltage distribution networks.* | Power Quality |
| **56** | **Enhanced Control Structure for Voltage Source Converters Under Unbalanced Grid Voltages**<br><br>**Objective:** *The main objective of this project to develop an enhanced control structure for Voltage Source Converters (VSCs) that minimizes* | Power Quality |

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| | *harmonic distortion, improves power quality, and ensures stable operation under unbalanced grid voltage conditions.* | |
| **57** | **Enhanced Grid Current Control using Novel Adaptive Filter EFOLMS in a Hybrid Wind–PV Battery System with Nonlinear Load Compensation**<br><br>**Objective:** *To develop an Enhanced Fractional-Order Least Mean Square (EFOLMS) adaptive filter for accurate extraction of the fundamental grid current in a hybrid Wind–PV–Battery system.* | Power Quality |
| **58** | **Fault Ride-Through Capability Enhancement of DFIG-Based Wind Power Plants Using BESS-STATCOM**<br><br>**Objective:** *To enhance the Fault Ride-Through (FRT) capability of DFIG-based wind power plants using a coordinated Battery Energy Storage System (BESS) and STATCOM, thereby improving voltage stability, reducing overcurrent's, and ensuring reliable grid operation during symmetrical and asymmetrical grid faults.* | Power Quality |
| **59** | **Fault Ride-Through Strategy of Grid-Forming Converters Based on Two Stage Virtual Admittance Control: Enhancing Transient Stability and Grid Support Capability**<br><br>**Objective:** *To develop a Fault Ride-Through (FRT) strategy for Grid-Forming (GFM) converters using a Two-Stage Virtual Admittance Control (TS-VAC) that limits fault current while enhancing transient synchronization stability and grid support capability during grid faults.* | Power Quality |
| **60** | **Harmonic Mitigation and Switching Frequency Reduction in LCL-Filtered Grid-Tied Converters**<br><br>**Objective:** *To propose a multivariable high-gain PI controller based on singular perturbation theory for LCL-filtered grid-tied converters, achieving resonance damping, harmonic mitigation, reduced switching frequency, and robust power quality under grid disturbances.* | Power Quality |
| **61** | **Hybrid Active-Passive Power Quality Enhancement for Power Distribution Systems**<br><br>**Objective:** To develop a modular hybrid active-passive power quality enhancement system by integrating a Shunt Active Power Filter (SAPF) with a detuned reactor–capacitor bank to mitigate harmonics, improve power factor, and enhance voltage quality in low-voltage commercial and industrial power distribution systems. | Power Quality |

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| **62** | **Hybrid Adaptive Dynamic Voltage Restorer for Power Quality Enhancement**<br><br>**Objective:** To develop a photovoltaic (PV)-supported Hybrid Adaptive Dynamic Voltage Restorer (DVR) for improving power quality by compensating voltage sag, swell, and harmonic disturbances while maintaining a stable DC-link voltage and ensuring reliable load-side voltage regulation in grid-connected power systems. | Power Quality |
| **63** | **Hybrid Integration of Fuel Cells and DFIG for Distributed Generation with Enhanced Power Quality**<br><br>**Objective:** To develop a hybrid distributed generation system integrating a DFIG-based wind energy conversion system, proton exchange membrane fuel cell, and battery energy storage using an LF-GSRS-based grid-side controller to enhance power quality, improve harmonic suppression, and ensure stable power coordination under varying operating conditions. | Power Quality |
| **64** | **Hybrid Renewable Energy System Incorporated with Shunt Active Power Filter with Improved Control Technique for Power Quality Mitigation**<br><br>**Objective**: To develop a Hybrid Renewable Energy System (HRES) integrated with a Shunt Active Power Filter (SAPF) using an MSRF-FLC-AHCC control strategy for mitigating harmonics, regulating DC-link voltage, and improving overall power quality under nonlinear load conditions. | Power Quality |
| **65** | **Improved Control Approaches for Dynamic Voltage Restoration in Doubly Fed Induction Generator-Based Wind Turbines**<br><br>**Objective**: *To improve voltage restoration and power quality in DFIG-based wind turbine systems by integrating a Dynamic Voltage Restorer (DVR) with advanced intelligent control techniques for effective voltage sag compensation and enhanced fault ride-through capability.* | Power Quality |
| **66** | **Improving Power Quality and Minimizing Harmonic Distortion in Grid-Connected Power Electronics with Power Filters**<br><br>**Objective:** *To improve power quality and minimize harmonic distortion in grid-connected renewable energy systems by developing a photovoltaic-assisted Unified Power Quality Conditioner (UPQC) using a 27-level multilevel inverter and intelligent control techniques for voltage and current compensation.* | Power Quality |

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| **67** | **Next-Generation Control Strategy for Renewable Microgrids with Bidirectional Battery Support**<br><br>**Objective:** *The main objective of this work is to develop a next-generation control strategy for a renewable hybrid microgrid consisting of a Solar Photovoltaic (SPV) system, Wind Energy Conversion System (WECS), and Battery Energy Storage System (BESS). The proposed system employs a Generalized Fourth-Order Filter (GFOF)-based Voltage Source Converter (VSC) to improve power quality, regulate the Common Coupling Point (CCP) voltage, suppress harmonics, and ensure effective power sharing among renewable energy sources.* | Power Quality |
| **68** | **Optimized PV Converter Fed HAPF for Improved Power Quality**<br><br>**Objective:** *The main objective of this work is to develop a solar PV-fed Hybrid Active Power Filter (HAPF) using a high-gain Interleaved Luo (I-Luo) converter to improve power quality in distribution systems. The study aims to maximize solar power extraction using a Class Topper Optimization (CTO)-based MPPT algorithm, while employing a Decoupled Neural Network (DNN) for accurate reference current generation and harmonic compensation.* | Power Quality |
| **69** | **Parallel Distributed Energy Generation Based Microgrid Incorporating Reactive Power Sharing and Grid Synchronization Capability**<br><br>**Objective:** *The main objective of this work is to develop a parallel distributed energy generation (DEG)-based microgrid capable of operating in both grid-connected and standalone modes while ensuring seamless grid synchronization and effective reactive power sharing among distributed energy resources. The proposed system integrates a Solar PV array, Wind Energy Conversion System (WECS), and Battery Storage System (BSS) using parallel Voltage Source Converters (VSCs).* | Power Quality |
| **70** | **Performance Comparison of a Dynamic Voltage Restorer Using DQ and PQ Control Methods**<br><br>**Objective:** *The main objective of this work is to develop and compare DQ (Synchronous Reference Frame) and PQ (Instantaneous Power Theory) control methods for a Dynamic Voltage Restorer (DVR) to mitigate voltage sag, voltage swell, and harmonic disturbances in distribution systems. The study aims to evaluate the dynamic performance, voltage restoration capability, harmonic mitigation, and* | Power Quality |

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| | *power quality improvement of both control techniques under balanced and unbalanced grid disturbances.* | |
| **71** | **Power Quality Enhancement in Grid Connected Renewable Energy Microgrids with Energy Storage: A Comprehensive Review**<br><br>**Objective:** *To comprehensively analyze power quality enhancement techniques for grid-connected renewable energy microgrids with energy storage, focusing on voltage regulation, harmonic mitigation, frequency stability, and reliable energy management to improve system efficiency, stability, and overall grid performance.* | Power Quality |
| **72** | **Power Quality Assessment of Microgrid using Shunt Active Power Filter**<br><br>**Objective:** *To enhance power quality in a renewable energy microgrid by integrating a Shunt Active Power Filter (SAPF) that reduces harmonic distortion, improves power factor, compensates reactive power, and ensures compliance with IEEE-519 standards under nonlinear load conditions.* | Power Quality |
| **73** | **Power Quality Enhancement using Shunt Active Power Filter employing SPWM and Hysteresis Control Techniques for Electric Vehicle Charger Loads**<br><br>**Objective:** *To enhance power quality in electric vehicle charger loads using a shunt active power filter controlled by SPWM and hysteresis techniques, reducing harmonic distortion, compensating reactive power, improving power factor, and ensuring stable, efficient grid operation.* | Power Quality |
| **74** | **Power quality Improvement in Distribution System using DVR**<br><br>**Objective:** *To improve power quality in electrical distribution systems by mitigating voltage sag and voltage swell using a Dynamic Voltage Restorer (DVR), thereby ensuring stable load voltage, reducing equipment damage, and enhancing the reliability and efficiency of power delivery.* | Power Quality |
| **75** | **Power quality improvement in a three-phase system using a shunt active power filter under nonlinear load conditions**<br><br>**Objective:** *To improve power quality in a three-phase system under nonlinear load conditions using a shunt active power filter, reducing harmonic distortion, compensating reactive power, improving power factor, and maintaining stable voltage and current for reliable system operation.* | Power Quality |

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| **76** | **Power Quality Improvement in Grid-Tied PVG-UAPF using MSOGI-NF**<br><br>**Objective:** *To enhance power quality in grid-connected photovoltaic generation systems by implementing a Unified Active Power Filter controlled using a Modified Second-Order Generalized Integrator, Notch Filter, and Super-Twisting Sliding Mode Controller for harmonic mitigation, DC-link regulation, and robust compensation under disturbed grid conditions.* | Power Quality |
| **77** | **Power Quality Improvement in Grid-Tied Solar PV Systems using d–q Control-based Shunt Active Power Filter**<br><br>**Objective:** *To improve power quality in grid-connected solar photovoltaic systems by integrating a d–q reference frame controlled Shunt Active Power Filter that suppresses harmonics, regulates the DC-link voltage, compensates reactive power, and ensures compliance with IEEE-519 standards.* | Power Quality |
| **78** | **Power Quality Improvement in Nonlinear Lighting Load Applications Using Shunt Active Power Filter Control**<br><br>**Objective:** *To improve power quality in nonlinear lighting load applications using a shunt active power filter, reducing harmonic distortion, compensating reactive power, enhancing power factor, and maintaining stable voltage and current to ensure efficient and reliable electrical system performance.* | Power Quality |
| **79** | **Power Quality Improvement of a Standalone Microgrid Supplied by Hybrid PV-Wind-Battery System**<br><br>**Objective:** *To develop a standalone hybrid PV–wind–battery microgrid that improves power quality by maintaining stable voltage and frequency, reducing harmonics, ensuring uninterrupted power supply, and efficiently managing renewable energy and battery storage under varying operating conditions* | Power Quality |
| **80** | **Power Quality Improvement using E-SOGI Controlled DSTATCOM with Wind Generation**<br><br>**Objective:** To improve power quality in a wind-integrated distribution system using an E-SOGI controlled DSTATCOM by mitigating harmonic distortion, compensating reactive power, regulating voltage, and maintaining stable grid performance under varying wind generation and load conditions. | Power Quality |
| **81** | **PQ Improvement of Four Wire Distribution Grid Based Dual Stage Solar PV Array Integrated UPQC** | Power Quality |

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| | **Objective:** *To enhance power quality in a four-wire distribution grid using a dual-stage solar PV array integrated Unified Power Quality Conditioner (UPQC), reducing harmonic distortion, compensating reactive power, regulating voltage, and ensuring balanced, reliable power delivery under varying load conditions.* | |
| **82** | **Research on the Impact of STATCOM in Improving Power Quality During Short-Circuit Testing**<br><br>**Objective:** To develop a STATCOM-based dynamic reactive power compensation strategy that mitigates voltage fluctuations and enhances power quality at the point of common coupling (PCC) during AC and DC short-circuit testing. | Power Quality |
| **83** | **Series-connected Mixed-switching-frequency Power Cells Featuring an Islanded Microgrid with Enhanced Power Quality Control**<br><br>**Objective:** To develop a series-connected mixed-switching-frequency power cell-based islanded microgrid that enhances power quality, achieves accurate power sharing, and minimizes harmonic distortion with reduced switching losses. | Power Quality |
| **84** | **Stability-Oriented Design of Adaptive Model Predictive Control With LCL-Filtered for Grid-Forming Inverters**<br><br>**Objective:** *To develop an adaptive model predictive control strategy for LCL-filtered grid-forming inverters that improves voltage and frequency stability, enhances disturbance rejection, and ensures reliable operation under varying operating conditions, cyber-attacks, and islanding scenarios.* | Power Quality |
| **85** | **Voltage Lifting Control + Third Harmonic Circulating Current Injection for Capacitance Reduction in Delta-CHB STATCOM**<br><br>**Objective:** *To develop a voltage lifting and third harmonic circulating current injection strategy that reduces submodule capacitance while maintaining capacitor voltage balance, improving STATCOM efficiency, and preserving reactive power compensation capability.* | Power Quality |
| **86** | **Voltage Profile Enhancement in a Solar Wind–Battery Connected Hybrid Power System using Dynamic Voltage Restore**<br>**Objective**: *To develop a hybrid solar–wind–battery power system integrated with a Dynamic Voltage Restorer (DVR) that enhances voltage stability, improves power quality, and maintains reliable grid operation under renewable energy and load variations.* | Power Quality |

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| **87** | **WRLS-Driven Robustness Enhancement of Nine-Switch Unified PV-DVR Systems Under Unbalanced Grid Conditions**<br><br>**Objective:** *To enhance the robustness of a unified PV-DVR system based on a nine-switch inverter by employing WRLS-assisted sequence estimation for maintaining nominal load voltage under asymmetrical grid fault conditions.* | Power Quality |
| **88** | **A Hybrid PV-Wind Single-Phase Transformer-Less Grid-Connected Cascaded NPC Inverter Minimizing Leakage Currents**<br><br>**Objective**: *To design and simulate a hybrid PV-wind transformer-less grid-connected cascaded NPC inverter in MATLAB/Simulink for minimizing leakage current, improving power quality, reducing THD, and enhancing grid integration performance.* | Hybrid Power Generation |
| **89** | **Advanced Control and Integration of Fuel Cell with Doubly Fed Induction Generators for Sustainable Power Generation**<br><br>**Objective:** *The main objective of this project to develop an M-ATLHCAF-controlled DFIG–fuel cell–battery hybrid renewable energy system that improves power quality, coordinates energy sources, minimizes harmonics, regulates DC-link voltage, and enhances dynamic grid stability.* | Hybrid Power Generation |
| **90** | **An Enhanced Adaptive Filter Controlled BES-Wind Driven DFIG Based Microgrid**<br><br>**Objective:** *The main objective of this To develop a UEHCRA filter-controlled DFIG-based wind microgrid with battery energy storage that enhances power quality, ensures seamless synchronization, reduces harmonics, and provides reliable power under grid-connected and islanded conditions.* | Hybrid Power Generation |
| **91** | **Design and Control of Virtual Synchronous Generator with Hybrid Energy Storage and Renewable Energy Systems**<br><br>**Objective:** *The main objective of this project to develop a Virtual Synchronous Generator (VSG) with a Hybrid Energy Storage System (HESS) that improves grid stability, smooths renewable energy fluctuations, and reduces installation cost through optimized energy management.* | Hybrid Power Generation |
| **92** | **Droop-Based Hierarchical Control for Power Sharing and Voltage Balancing in Bipolar DC Microgrids** | Hybrid Power Generation |

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| | **Objective:** *The main objective of this project to develop a droop-based hierarchical control strategy for bipolar DC microgrid that achieves accurate power sharing, voltage restoration, voltage balancing, and ESS SoC balancing under varying load conditions.* | |
| **93** | **Enhanced Grid Current Control using Novel Adaptive Filter EFOLMS in a Hybrid Wind–PV Battery System with Nonlinear Load Compensation**<br><br>**Objective:** *To develop an Enhanced Fractional-Order Least Mean Square (EFOLMS) adaptive filter for accurate extraction of the fundamental grid current in a hybrid Wind–PV–Battery system.*<br>*The proposed method aims to reduce harmonic distortion, maintain DC-link voltage stability, and improve power quality under varying renewable and nonlinear load conditions.* | Hybrid Power Generation |
| **94** | **Enhanced Grid Integration of Solar Photovoltaic using Battery Energy Storage**<br><br>**Objective:** *To develop a grid-connected Solar PV–Battery Energy Storage System (BESS) that smooths PV power fluctuations and ensures stable, reliable, and high-quality power injection into the utility grid.* | Hybrid Power Generation |
| **95** | **Fault Ride-Through Capability Enhancement of DFIG-Based Wind Power Plants Using BESS-STATCOM**<br><br>**Objective:** *To enhance the Fault Ride-Through (FRT) capability of DFIG-based wind power plants using a coordinated Battery Energy Storage System (BESS) and STATCOM, thereby improving voltage stability, reducing overcurrent's, and ensuring reliable grid operation during symmetrical and asymmetrical grid faults.* | Hybrid Power Generation |
| **96** | **Hybrid Integration of Fuel Cells and DFIG for Distributed Generation with Enhanced Power Quality**<br><br>**Objective:** *To develop a hybrid distributed generation system integrating a DFIG-based wind energy conversion system, proton exchange membrane fuel cell, and battery energy storage using an LF-GSRS-based grid-side controller to enhance power quality, improve harmonic suppression, and ensure stable power coordination under varying operating conditions.* | Hybrid Power Generation |

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| **97** | **Hybrid Renewable Energy System Incorporated with Shunt Active Power Filter with Improved Control Technique for Power Quality Mitigation**<br><br>**Objective:** *To develop a Hybrid Renewable Energy System (HRES) integrated with a Shunt Active Power Filter (SAPF) using an MSRF-FLC-AHCC control strategy for mitigating harmonics, regulating DC-link voltage, and improving overall power quality under nonlinear load conditions.* | Hybrid Power Generation |
| **98** | **Next-Generation Control Strategy for Renewable Microgrids with Bidirectional Battery Support**<br><br>**Objective:** *The main objective of this work is to develop a next-generation control strategy for a renewable hybrid microgrid consisting of a Solar Photovoltaic (SPV) system, Wind Energy Conversion System (WECS), and Battery Energy Storage System (BESS). The proposed system employs a Generalized Fourth-Order Filter (GFOF)-based Voltage Source Converter (VSC) to improve power quality, regulate the Common Coupling Point (CCP) voltage, suppress harmonics, and ensure effective power sharing among renewable energy sources.* | Hybrid Power Generation |
| **99** | **Parallel Distributed Energy Generation Based Microgrid Incorporating Reactive Power Sharing and Grid Synchronization Capability**<br><br>**Objective:** *The main objective of this work is to develop a parallel distributed energy generation (DEG)-based microgrid capable of operating in both grid-connected and standalone modes while ensuring seamless grid synchronization and effective reactive power sharing among distributed energy resources. The proposed system integrates a Solar PV array, Wind Energy Conversion System (WECS), and Battery Storage System (BSS) using parallel Voltage Source Converters (VSCs).* | Hybrid Power Generation |
| **100** | **Power Quality Enhancement in Grid Connected Renewable Energy Microgrids with Energy Storage**<br><br>**Objective:** *The main objective of this project is to improve power quality in grid-connected renewable energy microgrids by integrating advanced custom power devices and energy storage systems to achieve voltage regulation, harmonic mitigation, reactive power compensation, and stable operation under varying operating conditions.* | Hybrid Power Generation |

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| **101** | **Power Quality Improvement of a Standalone Microgrid Supplied by Hybrid PV-Wind-Battery System**<br><br>**Objective:** *The primary objective of this paper is to develop a hybrid PV–Wind–Battery standalone microgrid with an efficient control strategy that enhances power quality and maintains energy balance under varying renewable generation and load conditions.* | Hybrid Power Generation |
| **102** | **Reconfigurable Non-Isolated DC-DC Converter for DC Microgrid Applications**<br><br>**Objective:** *To develop a reconfigurable non-isolated DC–DC converter for DC microgrid applications that supports flexible boost, buck, and bidirectional power conversion with enhanced plug-and-play capability and reliable integration of renewable energy sources.* | Hybrid Power Generation |
| **103** | **Voltage Profile Enhancement in a Solar Wind–Battery Connected Hybrid Power System using Dynamic Voltage Restore**<br><br>**Objective:** *To develop a hybrid solar–wind–battery power system integrated with a Dynamic Voltage Restorer (DVR) that enhances voltage stability, improves power quality, and maintains reliable grid operation under renewable energy and load variations.* | Hybrid Power Generation |
| **104** | **Droop-Based Hierarchical Control for Power Sharing and Voltage Balancing in Bipolar DC Microgrids**<br><br>**Objective:** *The main objective of this project to develop a droop-based hierarchical control strategy for bipolar DC microgrid that achieves accurate power sharing, voltage restoration, voltage balancing, and ESS SoC balancing under varying load conditions.* | Microgrids |
| **105** | **Power Quality Enhancement in Grid Connected Renewable Energy Microgrids with Energy Storage: A Comprehensive Review**<br><br>**Objective:** *The main objective of this project is to improve power quality in grid-connected renewable energy microgrids by integrating advanced custom power devices and energy storage systems to achieve voltage regulation, harmonic mitigation, reactive power compensation, and stable operation under varying operating conditions.* | Microgrids |
| **106** | **Power Quality Assessment of Microgrid using Shunt Active Power Filter** | Microgrids |

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| | **Objective:** *To enhance power quality in a renewable energy microgrid by integrating a Shunt Active Power Filter (SAPF) that reduces harmonic distortion, improves power factor, compensates reactive power, and ensures compliance with IEEE-519 standards under nonlinear load conditions.* | |
| **107** | **Reconfigurable Non-Isolated DC-DC Converter for DC Microgrid Applications**<br><br>**Objective:** *To develop a reconfigurable non-isolated DC–DC converter for DC microgrid applications that supports flexible boost, buck, and bidirectional power conversion with enhanced plug-and-play capability and reliable integration of renewable energy sources.* | Microgrids |
| **108** | **Seamless Power Transfer of Bidirectional Converters in Microgrids Applications**<br><br>**Objective:** *To develop a communication-free control strategy for bidirectional DC–DC converters that enables seamless power transfer between charging and discharging modes, ensuring uninterrupted power supply and stable operation in hybrid AC–DC microgrids.* | Microgrids |
| **109** | **Series-connected Mixed-switching-frequency Power Cells Featuring an Islanded Microgrid with Enhanced Power Quality Control**<br><br>**Objective:** *To develop a series-connected mixed-switching-frequency power cell-based islanded microgrid that enhances power quality, achieves accurate power sharing, and minimizes harmonic distortion with reduced switching losses.* | Microgrids |
| **110** | **Stability-Oriented Adaptive Synchronization Control for Networked Microgrids**<br><br>**Objective:** *To develop an adaptive synchronization control mechanism for networked AC microgrids that dynamically adjusts synchronization controller gains, enhances voltage and frequency regulation, improves transient stability, and ensures robust operation under disturbances and plug-and-play conditions.* | Microgrids |
| **111** | **Adaptive Virtual Impedance Control for Series Active Compensator to Improve PV Power Injection in Distribution Networks**<br><br>**Objective:** *The main objective of this project Develop an adaptive virtual impedance-controlled Series Active Compensator to mitigate* | Distribution Systems |

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| | *distribution network overvoltage, maximize photovoltaic power injection, minimize converter capacity and feeder losses, and improve renewable energy utilization* | |
| **112** | **Hybrid Integration of Fuel Cells and DFIG for Distributed Generation with Enhanced Power Quality**<br><br>**Objective:** *To develop a hybrid distributed generation system integrating a DFIG-based wind energy conversion system, proton exchange membrane fuel cell, and battery energy storage using an LF-GSRS-based grid-side controller to enhance power quality, improve harmonic suppression, and ensure stable power coordination under varying operating conditions.* | Distribution Systems |
| **113** | **Power quality Improvement in Distribution System using DVR**<br><br>**Objective:** *To improve power quality in electrical distribution systems by mitigating voltage sag and voltage swell using a Dynamic Voltage Restorer (DVR), thereby ensuring stable load voltage, reducing equipment damage, and enhancing the reliability and efficiency of power delivery.* | Distribution Systems |
| **114** | **PQ Improvement of Four Wire Distribution Grid Based Dual Stage Solar PV Array Integrated UPQC**<br><br>**Objective:** *The main objective of this paper is to develop a dual-stage solar PV array integrated four-wire Unified Power Quality Conditioner (UPQC) to enhance power quality in distribution grids. The proposed system mitigates voltage sag/swell, harmonics, reactive power, neutral current, and load imbalance while maintaining balanced load voltage and sinusoidal grid currents under varying operating conditions.* | Distribution Systems |

## 2026– 2027 EEE CONTROL SYSTEMS IEEE TITLES

| S.NO | TITLE | DOMAIN |
|---|---|---|
| 01 | **Sliding Mode Derivative Estimator for Optimal Zero-Sequence Voltage Balancing of Grid-Tied NPC Converters**<br>**Objective:** *To develop a sliding mode derivative estimator for accurate neutral-point voltage balancing in grid-tied NPC converters, improving DC-link stability and power quality through optimal zero-sequence voltage injection.* | Control Systems |
| 02 | **Advanced Control and Integration of Fuel Cell with Doubly Fed Induction Generators for Sustainable Power Generation**<br>**Objective:** *The main objective of this project to develop an M-ATLHCAF-controlled DFIG–fuel cell–battery hybrid renewable energy system that improves power quality, coordinates energy sources, minimizes harmonics, regulates DC-link voltage, and enhances dynamic grid stability.* | Control Systems |
| 03 | **An Adaptive Model Predictive Control Scheme for Two-Stage Single-Phase Grid-Connected Photovoltaic System Using Variable Forgetting Factor Recursive Least Squares Estimator**<br>**Objective:** *The main objective of this project to develop an adaptive model predictive control scheme for a two-stage grid-connected photovoltaic system that improves MPPT efficiency, regulates DC-link voltage, reduces harmonics, and enhances grid stability under parameter uncertainties.* | Control Systems |
| 04 | **An Enhanced Adaptive Filter Controlled BES-Wind Driven DFIG Based Microgrid**<br>**Objective:** *The main objective of this to develop a UEHCRA filter-controlled DFIG-based wind microgrid with battery energy storage that enhances power quality, ensures seamless synchronization, reduces harmonics, and provides reliable power under grid-connected and islanded conditions.* | Control Systems |

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| **05** | **DBLN-Based IC-DSTATCOM for Power-Line Conditioning in the Power Distribution System**<br><br>**Objective:** *The main objective of this project to develop a DBLN-based IC-DSTATCOM for improving power quality by reducing harmonic distortion, enhancing power factor, regulating voltage, and providing efficient power-line conditioning in power distribution systems* | Control Systems |
| **06** | **Finite Control Set MPC for DFIG Direct Power Control in Distorted Grids**<br><br>**Objective:** *To propose a Finite Control Set Model Predictive Control (FCS-MPC) strategy integrated with DDSRF-PLL for DFIG direct power control, enhancing synchronization, reducing harmonic distortion, and improving dynamic performance under distorted grid-voltage conditions.* | Control Systems |
| **07** | **Power Quality Improvement in Nonlinear Lighting Load Applications Using Shunt Active Power Filter Control**<br><br>**Objective:** *To improve power quality in three-phase four-wire distribution systems supplying nonlinear lighting loads by implementing an advanced Shunt Active Power Filter with intelligent hysteresis current control for effective harmonic mitigation, reactive power compensation, and stable current regulation.* | Control Systems |

## 2026 – 2027 EEE POWER ELECTRONICS IEEE TITLES

| S.NO | TITLE | DOMAIN |
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| 01 | **DC-Link Voltage Control for a Hybrid Generator-Based Wind Turbine System**<br><br>**Objective:** *The main objective of this project to develop a Hybrid Generator-based Wind Turbine control scheme that regulates DC-link voltage independently of grid conditions, improves MPPT performance, eliminates PLL, and enhances system stability and efficiency.* | DC–AC Converters |
| 02 | **A Current Feed-Forward Method with Enhanced PLL Characteristics for Grid-Connected Inverter Under Weak Grid**<br><br>**Objective:** *To develop and simulate a current feed-forward control method with an enhanced phase-locked loop for a grid-connected inverter in MATLAB/Simulink to improve current quality, system stability, and weak grid performance.* | DC–AC Converters |
| 03 | **A Reconfigurable Modular Topology for PV Converter to Improve Overcurrent Capacity and Flexibility**<br><br>**Objective:** *To develop and simulate a reconfigurable modular photovoltaic converter that improves overcurrent capability, operational flexibility, and grid support performance under varying irradiance and grid disturbances using MATLAB/Simulink.* | DC–AC Converters |
| 04 | **Achieving Reduced Sizing for Shunt Active Power Filters: A Design Leveraging Load Impedance Analysis and Conservative Power Theory**<br><br>**Objective***: The main objective of this project to develop a reduced-rating Shunt Active Power Filter using load impedance optimization and Conservative Power Theory for efficient harmonic compensation and improved power quality.* | DC–AC Converters |
| 05 | **Adaptive Virtual Impedance Control for Series Active Compensator to Improve PV Power Injection in Distribution Networks**<br><br>**Objective***: The main objective of this project Develop an adaptive virtual impedance-controlled Series Active Compensator to mitigate* | DC–AC Converters |

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| | *distribution network overvoltage, maximize photovoltaic power injection, minimize converter capacity and feeder losses, and improve renewable energy utilization* | |
| **06** | **Advanced Control and Integration of Fuel Cell with Doubly Fed Induction Generators for Sustainable Power Generation**<br><br>**Objective:** *The main objective of this project to develop an M-ATLHCAF-controlled DFIG–fuel cell–battery hybrid renewable energy system that improves power quality, coordinates energy sources, minimizes harmonics, regulates DC-link voltage, and enhances dynamic grid stability.* | DC–AC Converters |
| **07** | **An Adaptive Model Predictive Control Scheme for Two-Stage Single-Phase Grid-Connected Photovoltaic System Using Variable Forgetting Factor Recursive Least Squares Estimator**<br><br>**Objective:** *The main objective of this project to develop an adaptive model predictive control scheme for a two-stage grid-connected photovoltaic system that improves MPPT efficiency, regulates DC-link voltage, reduces harmonics, and enhances grid stability under parameter uncertainties.* | DC–AC Converters |
| **08** | **An Enhanced Adaptive Filter Controlled BES-Wind Driven DFIG Based Microgrid**<br><br>**Objective:** *The main objective of this to develop a UEHCRA filter-controlled DFIG-based wind microgrid with battery energy storage that enhances power quality, ensures seamless synchronization, reduces harmonics, and provides reliable power under grid-connected and islanded conditions.* | DC–AC Converters |
| **09** | **Analytical Loss Minimization Control for IPMSM Using Linearized Torque and Loss Modeling**<br><br>**Objective:** *The main objective of this project to develop an analytical control strategy that minimizes the combined copper and iron losses in an IPMSM by determining the optimal current and voltage commands, thereby improving the efficiency of electric vehicle traction systems.* | DC–AC Converters |
| **10** | **DBLN-Based IC-DSTATCOM for Power-Line Conditioning in the Power Distribution System**<br><br>**Objective:** *The main objective of this project to develop a DBLN-based IC-DSTATCOM for improving power quality by reducing harmonic distortion, enhancing power factor, regulating voltage, and providing efficient power-line conditioning in power distribution systems* | DC–AC Converters |

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| **11** | **PQ Improvement of Four Wire Distribution Grid Based Dual Stage Solar PV Array Integrated UPQC**<br><br>**Objective:** *The main objective of this paper is to develop a dual-stage solar PV array integrated four-wire Unified Power Quality Conditioner (UPQC) to enhance power quality in distribution grids. The proposed system mitigates voltage sag/swell, harmonics, reactive power, neutral current, and load imbalance while maintaining balanced load voltage and sinusoidal grid currents under varying operating conditions.* | DC–AC Converters |
| **12** | **Decoupled Per-Phase Control of a Four-Leg Grid-Feeding Inverter for Voltage Unbalance Mitigation in Low-Voltage Networks**<br><br>**Objective:** *The main objective of this project to develop a decoupled per-phase control strategy for a four-leg grid-feeding inverter that mitigates voltage unbalance, enables independent phase current control, and improves power quality in low-voltage distribution networks.* | DC–AC Converters |
| **13** | **Design of a Fuel Cell Input Series-Connected High Step-Up Ratio with Secondary-Side LLC Resonant Converter for 800V EV Charger**<br><br>**Objective:** *The main objective of this project to develop a high step-up DC-DC converter for fuel cell-powered EV charging that efficiently converts 60–96 V input to 800 V output with reduced switching losses and improved efficiency* | DC–AC Converters |
| **14** | **Enhanced Field-Oriented Control for Induction Motors Under Open-Circuit Faults Using Decoupled Speed and Flux Control with Adaptive Control Technique**<br><br>**Objective:** *The main objective of this project to develop an enhanced fault-tolerant Field-Oriented Control (FOC) using adaptive PIR control that ensures continuous induction motor operation, reduces torque ripple, and maintains stable speed and flux under open-circuit faults* | DC–AC Converters |
| **15** | **Fault Ride-Through Capability Enhancement of DFIG-Based Wind Power Plants Using BESS-STATCOM**<br><br>**Objective:** *To enhance the Fault Ride-Through (FRT) capability of DFIG-based wind power plants using a coordinated Battery Energy Storage System (BESS) and STATCOM, thereby improving voltage stability, reducing overcurrent's, and ensuring reliable grid operation during symmetrical and asymmetrical grid faults.* | DC–AC Converters |
| **16** | **Modeling and Control of a 225-kW Grid-Interactive Bidirectional Fast DC Charger for Electric Vehicles**<br><br>**Objective:** *The main objective of this work is to model and control a 225-kW grid-interactive bidirectional fast DC charger for electric vehicles using MATLAB/Simscape. The study aims to develop a charger* | DC–AC Converters |

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| | *capable of operating in both Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G) modes while maintaining stable DC-link voltage, accurate current control, and low harmonic distortion.* | |
| **17** | **Photovoltaic-Integrated Wireless Charging Systems for Electric Vehicles: A Smart City Perspective on Sustainable Urban Mobility** **Objective:** *The main objective of this work is to develop a photovoltaic-integrated wireless charging system for electric vehicles (EVs) that supports sustainable urban transportation in smart cities. The proposed system aims to utilize solar photovoltaic (PV) energy as the primary power source for wireless EV charging while reducing dependence on conventional grid electricity.* | DC–AC Converters |
| **18** | **Power Quality Enhancement using Shunt Active Power Filter Employing SPWM and Hysteresis Control Techniques for Electric Vehicle Charger Loads**<br><br>**Objective:** *To enhance power quality for electric vehicle charger loads using a shunt active power filter with SPWM and hysteresis control techniques, reducing harmonic distortion, compensating reactive power, improving power factor, and ensuring stable, efficient, and reliable grid operation.* | DC–AC Converters |
| **19** | **Power Quality Improvement in Nonlinear Lighting Load Applications Using Shunt Active Power Filter Control**<br><br>**Objective:** *To improve power quality in nonlinear lighting load applications using a shunt active power filter, minimizing harmonic distortion, compensating reactive power, enhancing power factor, and maintaining stable voltage and current to ensure efficient, reliable, and high-quality power supply.* | DC–AC Converters |
| **20** | **Power Quality Improvement of a Standalone Microgrid Supplied by Hybrid PV-Wind-Battery System**<br><br>**Objective:** *To improve power quality in a standalone hybrid PV–wind–battery microgrid by minimizing harmonic distortion, regulating voltage and frequency, ensuring uninterrupted power supply, and optimizing renewable energy utilization through effective battery energy management and coordinated control strategies* | DC–AC Converters |
| **21** | **Voltage Lifting Control + Third Harmonic Circulating Current Injection for Capacitance Reduction in Delta-CHB STATCOM**<br><br>**Objective:** *To develop a voltage lifting and third harmonic circulating current injection strategy that reduces submodule capacitance while maintaining capacitor voltage balance, improving STATCOM efficiency, and preserving reactive power compensation capability.* | DC–AC Converters |

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| **22** | **Predictive Torque Control Based on Load Angle for an Induction Machine**<br><br>**Objective:** *The main objective of this paper is to develop a Predictive Torque Control based on Load Angle (PTC-LA) for three-phase induction machines to improve torque control performance while eliminating the need for weighting factors. The proposed method aims to reduce computational complexity, torque ripple, and steady-state speed error while enhancing robustness under parameter mismatch conditions.* | DC–AC Converters |
| **23** | **Seamless Power Transfer of Bidirectional Converters in Microgrids Applications**<br><br>**Objective:** *To develop a communication-free control strategy for bidirectional DC–DC converters that enables seamless power transfer between charging and discharging modes, ensuring uninterrupted power supply and stable operation in hybrid AC–DC microgrids.* | DC–AC Converters |
| **24** | **Stability-Oriented Design of Adaptive Model Predictive Control With LCL-Filtered for Grid-Forming Inverters**<br><br>**Objective:** *To develop an adaptive model predictive control strategy for LCL-filtered grid-forming inverters that improves voltage and frequency stability, enhances disturbance rejection, and ensures reliable operation under varying operating conditions, cyber-attacks, and islanding scenarios.* | DC–AC Converters |
| **25** | **Three-Level Interleaved Flying Capacitor DC–DC Converter with Variable DC-Link Control and Alternate 180° Phase Shift Modulation**<br><br>**Objective:** *To develop a three-level interleaved flying capacitor DC–DC converter with a variable DC-link voltage control strategy and an alternate 180° phase shift modulation technique to minimize current ripples, reduce passive component requirements, and improve converter efficiency for modern high-power power electronic applications.* | DC–AC Converters |
| **26** | **Dual-Input High-Gain Expandable Switched-Capacitor-Inductor Cell DC–DC Boost Converter**<br><br>**Objective:** *The main objective of this project to develop a dual-input high-gain DC–DC boost converter that achieves high voltage gain, low semiconductor stress, continuous input current, and efficient integration of multiple renewable energy sources.* | DC–DC Converters |

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| **27** | **A Novel Improved Voltage Gain and Reduced Voltage Stress Unidirectional DC/DC Converter for Electric Vehicle Battery Charging System**<br><br>**Objective:** *To design and simulate a novel unidirectional high-gain DC–DC converter for electric vehicle battery charging that achieves high voltage gain, reduced voltage stress on semiconductor devices, improved conversion efficiency, stable output voltage, and reliable battery charging performance using the MATLAB/Simulink environment.* | DC–DC Converters |
| **28** | **A Reconfigurable Modular Topology for PV Converter to Improve Overcurrent Capacity and Flexibility**<br><br>**Objective:** *To develop and simulate a reconfigurable modular photovoltaic converter that improves overcurrent capability, operational flexibility, and grid support performance under varying irradiance and grid disturbances using MATLAB/Simulink.* | DC–DC Converters |
| **29** | **An Adaptive Model Predictive Control Scheme for Two-Stage Single-Phase Grid-Connected Photovoltaic System Using Variable Forgetting Factor Recursive Least Squares Estimator**<br><br>**Objective:** *The main objective of this project to develop an adaptive model predictive control scheme for a two-stage grid-connected photovoltaic system that improves MPPT efficiency, regulates DC-link voltage, reduces harmonics, and enhances grid stability under parameter uncertainties.* | DC–DC Converters |
| **30** | **Comparison of Hard and Soft Switching Cascaded DC–DC Boost Converters for PV Applications**<br><br>**Objective:** *The main objective of this project to develop an MPPT-based active soft-switching cascaded DC–DC boost converter that achieves high voltage gain, minimizes switching losses, improves efficiency, and enhances PV power extraction under varying irradiance conditions.* | DC–DC Converters |
| **31** | **Design of a Fuel Cell Input Series-Connected High Step-Up Ratio with Secondary-Side LLC Resonant Converter for 800V EV Charger**<br><br>**Objective:** *The main objective of this project to develop a high step-up DC-DC converter for fuel cell-powered EV charging that efficiently converts 60–96 V input to 800 V output with reduced switching losses and improved efficiency* | DC–DC Converters |
| **32** | **Design of MPPT Controller for Solar Photovoltaic Emulator**<br><br>**Objective:** *The main objective of this project to design a PI-based Maximum Power Point Tracking (MPPT) controller for a solar* | DC–DC Converters |

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| | *photovoltaic emulator that accurately extracts maximum power under varying irradiance and temperature conditions.* | |
| **33** | **A Hybrid PV-Wind Single-Phase Transformer-Less Grid-Connected Cascaded NPC Inverter Minimizing Leakage Currents**<br><br>**Objective:** *To design and simulate a hybrid PV-wind transformer-less grid-connected cascaded NPC inverter in MATLAB/Simulink for minimizing leakage current, improving power quality, reducing THD, and enhancing grid integration performance.* | DC–DC Converters |
| **34** | **Advanced Control and Integration of Fuel Cell with Doubly Fed Induction Generators for Sustainable Power Generation**<br><br>**Objective:** *The main objective of this project to develop an M-ATLHCAF-controlled DFIG–fuel cell–battery hybrid renewable energy system that improves power quality, coordinates energy sources, minimizes harmonics, regulates DC-link voltage, and enhances dynamic grid stability.* | DC–DC Converters |
| **35** | **Analytical Loss Minimization Control for IPMSM Using Linearized Torque and Loss Modeling**<br>**Objective:** *The main objective of this project to develop an analytical control strategy that minimizes the combined copper and iron losses in an IPMSM by determining the optimal current and voltage commands, thereby improving the efficiency of electric vehicle traction systems.* | DC–DC Converters |
| **36** | **Dual-Input High-Gain Expandable Switched-Capacitor-Inductor Cell DC–DC Boost Converter**<br><br>**Objective:** *The main objective of this project to develop a dual-input high-gain DC–DC boost converter that achieves high voltage gain, low semiconductor stress, continuous input current, and efficient integration of multiple renewable energy sources.* | DC–DC Converters |
| **37** | **A Novel Improved Voltage Gain and Reduced Voltage Stress Unidirectional DC/DC Converter for Electric Vehicle Battery Charging System**<br><br>**Objective:** *To design and simulate a novel unidirectional high-gain DC–DC converter for electric vehicle battery charging that achieves high voltage gain, reduced voltage stress on semiconductor devices, improved conversion efficiency, stable output voltage, and reliable battery charging performance using the MATLAB/Simulink environment.* | DC–DC Converters |
| **38** | **A Reconfigurable Modular Topology for PV Converter to Improve Overcurrent Capacity and Flexibility**<br><br>**Objective:** *To develop and simulate a reconfigurable modular photovoltaic converter that improves overcurrent capability, operational flexibility, and* | DC–DC Converters |

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| | *grid support performance under varying irradiance and grid disturbances using MATLAB/Simulink.* | |
| **39** | **An Adaptive Model Predictive Control Scheme for Two-Stage Single-Phase Grid-Connected Photovoltaic System Using Variable Forgetting Factor Recursive Least Squares Estimator**<br>**Objective:** *The main objective of this project to develop an adaptive model predictive control scheme for a two-stage grid-connected photovoltaic system that improves MPPT efficiency, regulates DC-link voltage, reduces harmonics, and enhances grid stability under parameter uncertainties.* | DC–DC Converters |
| **40** | **Comparison of Hard and Soft Switching Cascaded DC–DC Boost Converters for PV Applications**<br>**Objective:** *The main objective of this project to develop an MPPT-based active soft-switching cascaded DC–DC boost converter that achieves high voltage gain, minimizes switching losses, improves efficiency, and enhances PV power extraction under varying irradiance conditions.* | DC–DC Converters |
| **41** | **Design of a Fuel Cell Input Series-Connected High Step-Up Ratio with Secondary-Side LLC Resonant Converter for 800V EV Charger**<br>**Objective:** *The main objective of this project to develop a high step-up DC-DC converter for fuel cell-powered EV charging that efficiently converts 60–96 V input to 800 V output with reduced switching losses and improved efficiency* | DC–DC Converters |
| **42** | **Design of MPPT Controller for Solar Photovoltaic Emulator**<br>**Objective:** *The main objective of this project to design a PI-based Maximum Power Point Tracking (MPPT) controller for a solar photovoltaic emulator that accurately extracts maximum power under varying irradiance and temperature conditions.* | DC–DC Converters |
| **43** | **High-Efficiency Bidirectional CLCLC Resonant DC–DC Converter with Soft-Switching Performance and Stability Optimization**<br>**Objective:** *To develop a high-efficiency bidirectional CLCLC resonant DC-DC converter capable of achieving Zero Voltage Switching (ZVS) and Zero Current Switching (ZCS) while improving converter efficiency, stability, and power transfer performance for EV and renewable energy applications.* | DC–DC Converters |
| **44** | **Multifunctional High Step-Up Nonisolated Three-Port DC–DC Converter for Hybrid Energy Systems** | DC–DC Converters |

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| | **Objective:** *The main objective of this work is to design and analyze a multifunctional high step-up non-isolated three-port DC–DC converter for hybrid energy systems. The proposed converter aims to efficiently integrate multiple energy sources and energy storage devices while providing a high voltage conversion ratio with reduced component count. The study also focuses on supporting multiple operating modes, improving conversion efficiency, minimizing voltage stress across semiconductor devices, and ensuring reliable power transfer under varying load conditions through MATLAB simulation.* | |
| **45** | **On the Necessity of DCM Operation for Buck and Boost Converters Between Constant Voltage Buses**<br><br>**Objective:** *The main objective of this paper is to investigate the necessity of operating buck and boost converters in Discontinuous Conduction Mode (DCM) when transferring power between constant voltage buses. The study derives mathematical relationships for converter operation, establishes the conditions required for stable steady-state performance. The proposed analysis is validated through LTspice simulations, providing design guidelines for selecting the inductor, calculating duty ratio, and achieving reliable converter operation in DC microgrids and electric vehicle applications.* | DC–DC Converters |
| **46** | **Power Control of a Capacitively Isolated Bidirectional DC–DC Converter with Auxiliary Converters**<br><br>**Objective:** *To develop an efficient control strategy for a capacitively isolated bidirectional DC–DC converter with auxiliary converters that enables stable bidirectional power transfer, reduces switching losses, improves power balance, and supports high-power railway applications.* | DC–DC Converters |
| **47** | **Power Quality Improvement of a Standalone Microgrid Supplied by Hybrid PV-Wind-Battery System**<br><br>**Objective:** *The primary objective of this paper is to develop a hybrid PV–Wind–Battery standalone microgrid with an efficient control strategy that enhances power quality and maintains energy balance under varying renewable generation and load conditions.* | DC–DC Converters |
| **48** | **Three-Level Interleaved Flying Capacitor DC–DC Converter with Variable DC-Link Control and Alternate 180◦ Phase Shift Modulation**<br><br>**Objective:** *To develop a three-level interleaved flying capacitor DC–DC converter with a variable DC-link voltage control strategy and an alternate 180° phase shift modulation technique to minimize current ripples, reduce passive component requirements, and improve converter efficiency for modern high-power power electronic applications.* | DC–DC Converters |
| **49** | **Medium Voltage AC to Isolated Multiport DC Converter for Electric Vehicle Fast-Charging Stations** | AC–DC Converters |

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| | **Objective:** *To develop a medium-voltage AC to isolated multiport DC converter for electric vehicle fast-charging stations that enables independent regulation of multiple DC ports, achieves unity power factor, and supports efficient bidirectional power transfer for future high-power charging infrastructure.* | |
| **50** | **A Four-Switches Wide-Output-Voltage PFC With Low Voltage Stress and Continuous Input–Output Currents**<br>**Objective:** *To design and simulate a four-switch wide-output-voltage power factor correction (PFC) rectifier with low voltage stress and continuous input-output currents for improving power quality, efficiency, and converter performance using MATLAB/Simulink.* | AC–DC Converters |
| **51** | **A Hybrid PV-Wind Single-Phase Transformer-Less Grid-Connected Cascaded NPC Inverter Minimizing Leakage Currents**<br>**Objective:** *To design and simulate a hybrid PV-wind transformer-less grid-connected cascaded NPC inverter in MATLAB/Simulink for minimizing leakage current, improving power quality, reducing THD, and enhancing grid integration performance.* | AC–DC Converters |
| **52** | **A Novel Flexible Power Control for Three-Phase Buck Rectifier Under Unbalanced Grid Voltages and Wide Grid Frequency**<br>**Objective:** *To develop a flexible power control strategy for a three-phase buck rectifier that maintains stable active and reactive power, minimizes current distortion, regulates power flow, and ensures reliable operation under unbalanced grid voltages and wide grid frequency variations.* | AC–DC Converters |
| **53** | **Advanced Control and Integration of Fuel Cell with Doubly Fed Induction Generators for Sustainable Power Generation**<br>**Objective:** *The main objective of this project to develop an M-ATLHCAF-controlled DFIG–fuel cell–battery hybrid renewable energy system that improves power quality, coordinates energy sources, minimizes harmonics, regulates DC-link voltage, and enhances dynamic grid stability.* | AC–DC Converters |
| **54** | **An Enhanced Adaptive Filter Controlled BES-Wind Driven DFIG Based Microgrid**<br>**Objective:** *The main objective of this to develop a UEHCRA filter-controlled DFIG-based wind microgrid with battery energy storage that enhances power quality, ensures seamless synchronization, reduces harmonics, and provides reliable power under grid-connected and islanded conditions.* | AC–DC Converters |

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| **55** | **DC-Link Voltage Control for a Hybrid Generator-Based Wind Turbine System**<br><br>**Objective:** *The main objective of this project to develop a Hybrid Generator-based Wind Turbine control scheme that regulates DC-link voltage independently of grid conditions, improves MPPT performance, eliminates PLL, and enhances system stability and efficiency.* | AC–DC Converters |
| **56** | **Discontinuous SVPWM-Based Speed Control of Unsymmetrical Two-Phase Induction Motor Using a Multifunctional Drive System**<br><br>**Objective:** The main objective of this project to develop a DUSVPWM-based multifunctional drive system for an unsymmetrical two-phase induction motor that reduces switching losses, improves inverter efficiency, enhances speed control, and maintains near-unity power factor. | AC–DC Converters |
| **57** | **Enhanced Grid Current Control using Novel Adaptive Filter EFOLMS in a Hybrid Wind–PV–Battery System with Nonlinear Load Compensation**<br><br>**Objective:** *To develop an Enhanced Fractional-Order Least Mean Square (EFOLMS) adaptive filter for accurate extraction of the fundamental grid current in a hybrid Wind–PV–Battery system.*<br><br>*The proposed method aims to reduce harmonic distortion, maintain DC-link voltage stability, and improve power quality under varying renewable and nonlinear load conditions.* | AC–DC Converters |
| **58** | **Fault Ride-Through Capability Enhancement of DFIG-Based Wind Power Plants Using BESS-STATCOM**<br><br>**Objective:** *To enhance the Fault Ride-Through (FRT) capability of DFIG-based wind power plants using a coordinated Battery Energy Storage System (BESS) and STATCOM, thereby improving voltage stability, reducing overcurrent's, and ensuring reliable grid operation during symmetrical and asymmetrical grid faults.* | AC–DC Converters |
| **59** | **Single-Stage Wireless Charging System for EVs With PFC and Buck Operation**<br><br>**Objective:** *To develop a compact single-stage wireless charging system for electric vehicles that integrates power factor correction (PFC) and buck conversion, enabling efficient, low-cost, and high-performance battery charging with reduced component count.* | AC–DC Converters |
| **60** | **PQ Improvement of Four Wire Distribution Grid Based Dual Stage Solar PV Array Integrated UPQC** | AC–DC Converters |

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| | **Objective:** *The main objective of this paper is to develop a dual-stage solar PV array integrated four-wire Unified Power Quality Conditioner (UPQC) to enhance power quality in distribution grids. The proposed system mitigates voltage sag/swell, harmonics, reactive power, neutral current, and load imbalance while maintaining balanced load voltage and sinusoidal grid currents under varying operating conditions.* | |
| **61** | **Single-Stage Wireless Charging System for EVs With PFC and Buck Operation**<br><br>**Objective:** *To develop a compact single-stage wireless charging system for electric vehicles that integrates power factor correction (PFC) and buck conversion, enabling efficient, low-cost, and high-performance battery charging with reduced component count.* | AC–AC Converters |
| **62** | **Design of a Fuel Cell Input Series-Connected High Step-Up Ratio with Secondary-Side LLC Resonant Converter for 800V EV Charger**<br><br>**Objective:** *The main objective of this project to develop a high step-up DC-DC converter for fuel cell-powered EV charging that efficiently converts 60–96 V input to 800 V output with reduced switching losses and improved efficiency* | AC–AC Converters |
| **63** | **Weighting-Factor-Free Predictive Torque Control Structures for 3L-NPC Inverter-Fed Induction Motor Drives**<br><br>**Objective:** *To develop weighting-factor-free predictive torque control structures for a three-level neutral-point-clamped inverter-fed induction motor that reduce computational complexity while improving torque control, stator flux regulation, and DC-link capacitor voltage balancing.* | Multi-Level Inverters |
| **64** | **A T-STATCOM Converter Structure Synergistically Combining IGBTs and SiC-MOSFETs**<br><br>**Objective:** *To design and simulate a hybrid T-STATCOM using a three-level NPC converter and two-level SiC-MOSFET converter in MATLAB/Simulink for reactive power compensation, harmonic reduction, and improved grid voltage regulation.* | Multi-Level Inverters |
| **65** | **A Hybrid PV-Wind Single-Phase Transformer-Less Grid-Connected Cascaded NPC Inverter Minimizing Leakage Currents**<br><br>**Objective:** *To design and simulate a hybrid PV-wind transformer-less grid-connected cascaded NPC inverter in MATLAB/Simulink for minimizing leakage current, improving power quality, reducing THD, and enhancing grid integration performance.* | Multi-Level Inverters |

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| **66** | **A New Self-Balanced Six-Level Switched-Capacitor Inverter**<br><br>**Objective:** *To design and simulate a self-balanced six-level switched-capacitor inverter in MATLAB/Simulink for voltage boosting, harmonic reduction, improved output voltage quality, and efficient single-source power conversion.* | Multi-Level Inverters |
| **67** | **A Unified Computationally Efficient Model Predictive Control for Multilevel Inverter–Fed Multiphase PMSM Drives for Electric Vehicles**<br><br>**Objective:** *To develop and simulate a generalized model predictive control strategy for multilevel inverter-fed multiphase PMSM drives using MATLAB/Simulink to improve torque response, reduce current THD, and enhance computational efficiency.* | Multi-Level Inverters |
| **68** | **Coordinated Control of VSI Dead Angle (β) and Isolating Transformer Tap Changer for High Power Grid Connected Solar PV Based Power Generation**<br><br>**Objective:** *The main objective of this project to develop a coordinated control strategy for VSI dead angle (β) and transformer tap changer that minimizes harmonic distortion, improves grid power quality, and ensures efficient grid-connected solar photovoltaic power generation.* | Multi-Level Inverters |
| **69** | **Sliding Mode Derivative Estimator for Optimal Zero-Sequence Voltage Balancing of Grid-Tied NPC Converters**<br><br>**Objective:** *To develop a sliding mode derivative estimator for accurate neutral-point voltage balancing in grid-tied NPC converters, improving DC-link stability and power quality through optimal zero-sequence voltage injection.* | Multi-Level Inverters |
| **70** | **Three-Phase Multilevel Current Source Rectifier with Double DC Output Using Semi-Controlled Converters**<br><br>**Objective***: To develop a three-phase multilevel current source rectifier with dual DC outputs using semi-controlled converters that reduces active switches, improves efficiency, maintains balanced DC-link currents, and achieves low harmonic distortion with unity power factor.* | Multi-Level Inverters |
| **71** | **Voltage Balancing and Switching Losses Minimization for Dual Three-Phase NPC Inverters in Electric Vehicle Multi-Motor Drives**<br><br>**Objective:** To develop a collaborative voltage balancing strategy for dual three-phase NPC inverters that minimizes DC-link capacitor voltage imbalance and switching losses while improving the efficiency and reliability of multi-motor electric vehicle drive systems. | Multi-Level Inverters |

## 2026 – 2027 EEE ELECTRICAL DRIVES IEEE TITLES

| S.NO | TITLE | DOMAIN |
|---|---|---|
| 01 | **A Unified Computationally Efficient Model Predictive Control for Multilevel Inverter–Fed Multiphase PMSM Drives for Electric Vehicles**<br><br>**Objective:** *To develop and simulate a generalized model predictive control strategy for multilevel inverter-fed multiphase PMSM drives using MATLAB/Simulink to improve torque response, reduce current THD, and enhance computational efficiency.* | AC DRIVES |
| 02 | **Achieving Reduced Sizing for Shunt Active Power Filters: A Design Leveraging Load Impedance Analysis and Conservative Power Theory**<br><br>**Objective:** *The main objective of this project to develop a reduced-rating Shunt Active Power Filter using load impedance optimization and Conservative Power Theory for efficient harmonic compensation and improved power quality.* | AC DRIVES |
| 03 | **Analytical Loss Minimization Control for IPMSM Using Linearized Torque and Loss Modeling**<br><br>**Objective:** *The main objective of this project to develop an analytical control strategy that minimizes the combined copper and iron losses in an IPMSM by determining the optimal current and voltage commands, thereby improving the efficiency of electric vehicle traction systems.* | AC DRIVES |
| 04 | **Discontinuous SVPWM-Based Speed Control of Unsymmetrical Two-Phase Induction Motor Using a Multifunctional Drive System**<br><br>**Objective:** *The main objective of this project to develop a DUSVPWM-based multifunctional drive system for an unsymmetrical two-phase induction motor that reduces switching losses, improves inverter efficiency, enhances speed control, and maintains near-unity power factor.* | AC DRIVES |

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| **05** | **Enhanced Field-Oriented Control for Induction Motors Under Open-Circuit Faults Using Decoupled Speed and Flux Control with Adaptive Control Technique**<br><br>**Objective**: *The main objective of this project to develop an enhanced fault-tolerant Field-Oriented Control (FOC) using adaptive PIR control that ensures continuous induction motor operation, reduces torque ripple, and maintains stable speed and flux under open-circuit faults* | AC DRIVES |
| **06** | **Feed-Forward Method for Increasing Efficiency of BLDC Motors by Injection of Higher Time-Harmonic Components**<br><br>**Objective:** *To enhance BLDC motor efficiency by reducing current ripple and torque pulsations through feed-forward injection of higher time-harmonic voltage components, enabling improved performance without additional hardware or major modifications to conventional FOC control.* | AC DRIVES |
| **07** | **Hall Sensor Zero-Position Compensation Algorithm for PMaSynRM Under Field-Oriented Control Scheme**<br><br>**Objective:** *To propose an offline identification-based Hall sensor zero-position compensation algorithm integrated with Field-Oriented Control (FOC) and Maximum Torque Per Ampere (MTPA), enhancing rotor position estimation accuracy and stable PMaSynRM operation under varying load conditions.* | AC DRIVES |
| **08** | **Hybrid Multi-Vector Model Predictive Flux Control for Open Winding Induction Motor**<br><br>**Objective:** *To develop a hybrid multi-vector model predictive flux control (MPFC) strategy for a common DC bus open-winding induction motor (OWIM) to suppress zero-sequence current, reduce torque and speed ripples, and improve DC-link voltage utilization and motor control performance.* | AC DRIVES |
| **09** | **Predictive Torque Control Based on Load Angle for an Induction Machine** | AC DRIVES |

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| | **Objective:** *The main objective of this paper is to develop a Predictive Torque Control based on Load Angle (PTC-LA) for three-phase induction machines to improve torque control performance while eliminating the need for weighting factors. The proposed method aims to reduce computational complexity, torque ripple, and steady-state speed error while enhancing robustness under parameter mismatch conditions.* | |
| **10** | **Vector Control of PMSM Based on Misaligned Hall-Effect Sensors**<br><br>**Objective:** *To develop a robust vector control strategy for Permanent Magnet Synchronous Motors (PMSMs) using Hall-effect sensors by employing a Novel Adaptive Filter (NAF) and an Improved Phase-Locked Loop (IPLL) to achieve accurate rotor position and speed estimation under sensor misalignment conditions.* | AC DRIVES |
| **11** | **Weighting-Factor-Free Predictive Torque Control Structures for 3L-NPC Inverter-Fed Induction Motor Drives**<br><br>**Objective:** *To develop weighting-factor-free predictive torque control structures for a three-level neutral-point-clamped inverter-fed induction motor that reduce computational complexity while improving torque control, stator flux regulation, and DC-link capacitor voltage balancing.* | AC DRIVES |
| **12** | **A Novel Improved Voltage Gain and Reduced Voltage Stress Unidirectional DC/DC Converter for Electric Vehicle Battery Charging System**<br><br>**Objective:** *To design and simulate a novel unidirectional high-gain DC–DC converter for electric vehicle battery charging that achieves high voltage gain, reduced voltage stress on semiconductor devices, improved conversion efficiency, stable output voltage, and reliable battery charging performance using the MATLAB/Simulink environment.* | ELECTRIC VEHICLES |
| **13** | **A Unified Computationally Efficient Model Predictive Control for Multilevel Inverter–Fed Multiphase PMSM Drives for Electric Vehicles** | ELECTRIC VEHICLES |

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| | **Objective** To develop and simulate a generalized model predictive control strategy for multilevel inverter-fed multiphase PMSM drives using MATLAB/Simulink to improve torque response, reduce current THD, and enhance computational efficiency. | |
| **14** | **Design of a Fuel Cell Input Series-Connected High Step-Up Ratio with Secondary-Side LLC Resonant Converter for 800V EV Charger**<br><br>**Objective:** *The main objective of this project to develop a high step-up DC-DC converter for fuel cell-powered EV charging that efficiently converts 60–96 V input to 800 V output with reduced switching losses and improved efficiency.* | ELECTRIC VEHICLES |
| **15** | **Grid Integrated Single-Stage Current-Fed Three-Port Converter for High and Low Voltage Battery Charging in Electric Vehicles**<br><br>**Objective:** *To propose a grid-integrated single-stage current-fed three-port converter with adaptive sinusoidal PWM for simultaneous charging of high- and low-voltage EV batteries, ensuring galvanic isolation, high efficiency, unity power factor, and reduced converter complexity.* | ELECTRIC VEHICLES |
| **16** | **Medium Voltage AC to Isolated Multiport DC Converter for Electric Vehicle Fast-Charging Stations**<br><br>**Objective:** *To develop a medium-voltage AC to isolated multiport DC converter for electric vehicle fast-charging stations that enables independent regulation of multiple DC ports, achieves unity power factor, and supports efficient bidirectional power transfer for future high-power charging infrastructure.* | ELECTRIC VEHICLES |
| **17** | **Modeling and Control of a 225-KW Grid-Interactive Bidirectional Fast DC Charger for Electric Vehicles**<br><br>**Objective:** *The main objective of this work is to model and control a 225-kW grid-interactive bidirectional fast DC charger for electric vehicles using MATLAB/Simscape. The study aims to develop a charger capable of operating in both Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G)* | ELECTRIC VEHICLES |

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| | *modes while maintaining stable DC-link voltage, accurate current control, and low harmonic distortion.* | |
| **18** | **Modeling and Simulation of Solar Powered EV Charging Circuit for Smart Grid Integration in G2V and V2G Modes**<br><br>**Objective:** *The main objective of this work is to design and simulate a solar-powered EV charging circuit integrated with the smart grid for both Grid-to-Vehicle (G2V) and Vehicle-to-Grid (V2G) modes using MATLAB/Simulink. The study aims to maximize the utilization of solar energy, enable bidirectional power flow between the EV battery and the utility grid, and improve overall energy management.* | ELECTRIC VEHICLES |
| **19** | **PERFORMANCE ENHANCEMENT OF SOLAR PV INTEGRATED EV CHARGING STATIONS**<br><br>**Objective:** *The main objective of this work is to develop a Solar PV integrated EV charging station employing a Hybrid Energy Storage System (HESS) consisting of a lithium-ion battery and a supercapacitor to improve charging performance and energy management. The proposed system aims to maximize solar energy utilization through a Constant Voltage (CV)-based MPPT boost converter, maintain DC-link voltage stability, reduce battery stress, minimize grid dependency.* | ELECTRIC VEHICLES |
| **20** | **Photovoltaic-Integrated Wireless Charging Systems for Electric Vehicles: A Smart City Perspective on Sustainable Urban Mobility**<br><br>**Objective:** *The main objective of this work is to develop a photovoltaic-integrated wireless charging system for electric vehicles (EVs) that supports sustainable urban transportation in smart cities. The proposed system aims to utilize solar photovoltaic (PV) energy as the primary power source for wireless EV charging while reducing dependence on conventional grid electricity.* | ELECTRIC VEHICLES |
| **21** | **Seamless Power Transfer of Bidirectional Converters in Microgrids Applications** | ELECTRIC VEHICLES |

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| | **Objective:** *To develop a communication-free control strategy for bidirectional DC–DC converters that enables seamless power transfer between charging and discharging modes, ensuring uninterrupted power supply and stable operation in hybrid AC–DC microgrids.* | |
| **22** | **Single-Stage Wireless Charging System for EVs With PFC and Buck Operation**<br><br>**Objective:** *To develop a compact single-stage wireless charging system for electric vehicles that integrates power factor correction (PFC) and buck conversion, enabling efficient, low-cost, and high-performance battery charging with reduced component count.* | ELECTRIC VEHICLES |
| **23** | **Voltage Balancing and Switching Losses Minimization for Dual Three-Phase NPC Inverters in Electric Vehicle Multi-Motor Drives**<br><br>**Objective:** *To develop a collaborative voltage balancing strategy for dual three-phase NPC inverters that minimizes DC-link capacitor voltage imbalance and switching losses while improving the efficiency and reliability of multi-motor electric vehicle drive systems.* | ELECTRIC VEHICLES |
| **24** | **Design of an Asymmetrical LCL Filter for Stability Enhancement in Multi-Electric Vehicle V2G Systems**<br><br>**Objective:** *To develop and simulate a vehicle-to-grid (V2G) system with an asymmetrical LCL filter in MATLAB/Simulink to improve power quality, enhance fault ride-through capability, ensure stable DC-link voltage regulation, and maintain reliable bidirectional power transfer under grid fault conditions.* | ELECTRIC VEHICLES |

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**Venkatesh U**

★★★★★

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**Meenakshi Narayan**

★★★★★

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