SCHOLARLY PUBLICATIONS
School of Electrical Engineering
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Journal Name: **IEEE Transactions on Industrial Informatics** **IF: 11.7**

Title: An Improved Protective Relaying Technique for Transmission Line Connected with UPFC and DFIG-Based Wind Farm

Author: Mohanty S.K.; Mohapatra S.; Siano P.

Details: Volume 23, Issue 1, December 2024

Abstract: Breast cancer, the most frequent female malignancy, is often curable when detected at an early stage. The treatment of metastatic breast cancer is more challenging and may be unresponsive to conventional therapy. Immunotherapy is crucial for treating metastatic breast cancer, but its resistance is a major limitation. The tumor microenvironment (TME) is vital in modulating the immunotherapy response. Various tumor microenvironmental components, such as cancer-associated fibroblasts (CAFs), tumor-associated macrophages (TAMs), and myeloid-derived suppressor cells (MDSCs), are involved in TME modulation to cause immunotherapy resistance. This review highlights the role of stromal cells in modulating the breast tumor microenvironment, including the involvement of CAF-TAM interaction, alteration of tumor metabolism leading to immunotherapy failure, and other latest strategies, including high throughput genomic screening, single-cell and spatial omics techniques for identifying tumor immune genes regulating immunotherapy response. This review emphasizes the therapeutic approach to overcome breast cancer immune resistance through CAF reprogramming, modulation of TAM polarization, tumor metabolism, and genomic alterations.

URL: https://ieeexplore.ieee.org/document/10702343

SCHOLARLY PUBLICATIONS
School of Electrical Engineering
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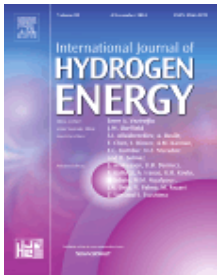
Journal Name: **International Journal of Hydrogen Energy** **IF: 8.1**

Title: Coordinated planning and operation of PV- hydrogen integrated distribution network incorporating daily-seasonal green hydrogen storage and EV charging station

Author: Nandi S.; Ghatak S.R.; Sannigrahi S.; Acharjee P.

Details: Volume 90, November 2024

Abstract: The current study introduces an optimal planning and operational framework for a Distribution Network (DN) that integrates Photovoltaic (PV)-green Hydrogen (H_2)-based energy system with Electric Vehicle Charging Station (EVCS). An efficient operational strategy is proposed considering both short-term H_2 storage (STHS) and long-term H_2 storage (LTHS), ensuring uninterrupted power supply. Besides, a novel Improved Harris Hawk Optimization method is developed to enhance the global search capabilities and convergence rate in optimizing the capacity of Solar module, Electrolyzer, and Fuel cells. The objective of the proposed model is to minimize the device costs, energy loss, and carbon emissions, adhering to all operational constraints. The proposed work is tested on 33-bus radial DN and 51-bus real Indian DN considering the time frame of 10 years. The analysis reveals that the PV-STHS-LTHS configuration, reduces total planning costs by 12% and 15% as compared to the base case in the 33-bus and 51-bus systems, respectively. Additionally, the integration of both daily and seasonal storage facilities with PV systems leads to a reduction in carbon emissions by 76% and 81% in the 33-bus and 51-bus systems, respectively. Besides the carbon reduction, the incorporation of daily and cross-seasonal H_2 storage increases oxygen release into the environment by 13% for the 33-bus system and 15% for the 51-bus system.



URL: https://www.sciencedirect.com/science/article/pii/S0360319924041284?via%3Dihub

SCHOLARLY PUBLICATIONS
School of Electrical Engineering
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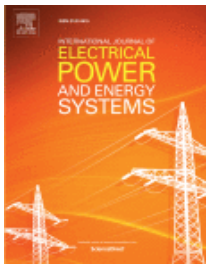
Journal Name: International Journal of Electrical Power and Energy Systems **IF: 5.0**

Title: Intelligent protective relaying for the series compensated line with high penetration of wind energy sources

Author: Mohanty S.K., Nayak P.K., Siano P., Swetapadma A.

Details: Volume 163, December 2024

Abstract: The bulk amount of power generated from the present-day large-scale DFIG-installed wind farms are preferably transmitted to utility grid through series compensated transmission lines. Currently, TCSC compensation is more attractive compared to fixed series compensation due to its numerous technical advantages. However, the nonlinear relationship of the output power verses wind speed and the different operating modes of the DFIG and TCSC cause rapid variation in the line impedance during both normal as well as fault conditions. Consequently, the widely used fixed impedance-based distance relays when used for protection of such lines find limitation. In this paper, a fast discrete S-transform feature-assisted back propagation neural network technique is proposed using the relay end current measurements for effective detection and classification of faults in such crucial transmission lines. The efficacy of the scheme is evaluated on numerous fault and non-fault cases simulated through MATLAB/Simulink on different standard test systems under varying system operating conditions. The results clearly show the superiority of the proposed method in comparision to the existing approaches in terms of its low computational burden, fast fault detection time (< 10 ms) and accuracies (= 100 %) and fast fault classification time (< 10 ms) and accuracies (99.99 %).



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