Solar Intelligent Photovoltaic Controller

This paper proposes an intelligent controller design that will integrate three main sources of power: solar, wind and thermal power in such a way that it will reduce the burden of power generation from thermal power plant and tries to replace thermal power plant use with solar-wind hybrid power plant use. The goal of the proposed model is to reduce air pollution specially due ...

Solar photovoltaic Maximum Power Point Tracking controller optimization using Grey Wolf Optimizer: A performance comparison between bio-inspired and traditional algorithms Author links open overlay panel Jesus Aguila-Leon a b, Carlos Vargas-Salgado a c, Cristian Chiñas-Palacios a b, Dácil Díaz-Bello a

This article deals in the modelling of intelligent controller for the Hybrid photovoltaic (PV)/Wind based smart grid system. With the development of solid state electronics also power systems ...

Modeling of intelligent controllers for solar photovoltaic system under varying irradiation conditions Malhar Khan1, Muhammad Amir Raza1, Touqeer Ahmed Jumani1, Sohrab Mirsaeidi2*, Aamir Ali3, Ghulam Abbas4, Ezzeddine Touti5 and Ahmed Alshahir6 1Department of Electrical Engineering, Mehran University of Engineering and Technology, Jamshoro,

This paper is a review on the up to date scientific achievements in applying Artificial Intelligence (AI) techniques in Photovoltaic (PV) systems. It surveys the role of AI ...

As a green and renewable energy source, photovoltaic power is of great significance for the sustainable development of energy and has been increasingly exploited. The photovoltaic controller is the key component of a photovoltaic power generation system, ...

PDF | This paper presents an Intelligent controller designed to mastery the output power flow from the Solar System, the Wind system, the sum of the two... | Find, read and cite all the research ...

Liu C, Wu B, Cheung R (2004) Advanced algorithm for mppt control of photovoltaic systems. In: Proceeding of the Canadian solar buildings conference, Montreal. Rai AK, Kaushika ND, Singh B, Agarwal N (2011) Simulation model of ANN based maximum power point tracking controller for solar PV system. Sol Energy Mater Sol Cells 95(2):773-778

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F fuzzy PI control model is used to improve the performance of intelligent photovoltaic grid-connected inverter to simulate the intelligent photvoltaic inverter system, and an improved repetitive control strategy is adopted. The grid connected inverter is the core component of the photovoltaic grid connected power

generation system, which mainly ...

Solar Tracking Control Algorithm Based on Artificial Intelligence Applied to Large-Scale Bifacial Photovoltaic Power Plants. by. José Vinícius Santos de Araújo. 1, Micael Praxedes de Lucena. 2, Ademar ...

Solar photovoltaic converter controller using opposition-based reinforcement learning with butterfly optimization algorithm under partial shading conditions Environ Sci Pollut Res, 30 (28) (May 2023), pp. 72617 - 72640, 10.1007/s11356-023-27261-1

On a clear day and when the Sun is directly overhead, almost 70% of the incident solar radiation reaches the Earth"s surface. The magnitude of solar radiation that is scattered or absorbed depends on the amount of atmosphere it must travel before reaching the Earth"s surface [] nsequently, Air Mass (AM) depicts the relative distance that solar radiation must travel to ...

The solar photovoltaic power is integrated with the DC link of a syncro converter through the boost converter. The switching control function of the boost converter is operated with an intelligent controller to step up the voltage and track the maximum power from the intermittent nature of solar photovoltaic system. The Radial Basis Function ...

open access. Abstract. This research provides an adaptive control design in a photovoltaic system (PV) for maximum power point tracking (MPPT). In the PV system, ...

The system integrates essential components including a photovoltaic module, solar charger controller,... This research paper presents the development of an autonomous photovoltaic street lighting system featuring intelligent control through a smart relay. The system integrates essential components including a photovoltaic module, solar charger ...

Solar photovoltaic (PV) systems, however, exhibit nonlinear output power due to their weather-dependent nature, impacting overall system efficiency. This study focuses on ...

This work models and simulates a hybrid renewable energy system with solar photovoltaic, wind turbine, diesel generator, and consumer load. An adaptive neuro-fuzzy ...

In 2022 International Conference on Intelligent Controller and Computing for Smart Power (ICICCSP). 10.1109/ICICCSP53532.2022.9862396 Search in Google Scholar. Rohit, A. K., Tomar, A., Kumar, A., and Rangnekar, S. 2017. ...

The design and integration of a novel two-level supervisory active power control scheme for solar photovoltaic (PV) power plants is described in this paper. The scheme maintains active power reserves by operating the PV below its maximum power point (MPP) to damp electromechanical oscillations in power

systems. An intelligently designed fuzzy logic ...

Modeling of intelligent controllers for solar photovoltaic system under varying irradiation conditions Malhar Khan1, Muhammad Amir Raza1, Touqeer Ahmed Jumani1, Sohrab Mirsaeidi2*, Aamir Ali3 ...

Intelligent Controller based Solar Photovoltaic with Battery Storage, Fuel Cell Integration for Power Conditioning . Providing clean power and meeting the power demand are the biggest issues in the current power scenario. These issues can be alleviated with the integration of renewable energy sources (RES) such as solar, wind etc. The solar photovoltaic source ...

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Mao, M. et al. Classification and summarization of solar photovoltaic MPPT techniques: A review based on traditional and intelligent control strategies. Energy Rep. 6, 1312-1327. https://doi ...

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The photovoltaic solar controller can be divided into a switch type controller, a pulse width modulation (PWM) type charge controller, a maximum power point tracing (MPPT) charge controller, and an intelligent controller according to functions and circuit structures. Switch type controller. The main function of the general charging and discharging controller ...

Kiran, S. R., Murali, M., Hussaian Basha, C. & Fathima, F. Design of artificial intelligence-based hybrid MPPT controllers for partially shaded solar PV system with non ...

Power electronics combined with intelligent control help PV systems to be observable, controllable, and adjustable. However, the degree of intelligence of PV systems is still at a low level. The potential of intelligent ...