The logic of solar power generation

In the last two decades, renewable energy has been paid immeasurable attention to toward the attainment of electricity requirements for domestic, industrial, and agriculture sectors. Solar forecasting plays a vital role in smooth operation, scheduling, and balancing of electricity production by standalone PV plants as well as grid interconnected solar PV plants. ...

Wind and solar power generation facilities are particularly promising because of their limitless availability, ... Although the fuzzy logic based Interline Unified Power Quality Conditioner (IUPQC ...

These conditions when combined play a role in forecasting the output of solar energy system. In this paper, considering the above-mentioned four variables, a simple and accurate method for prediction of solar power generation with the help of fuzzy logic model based on the Mamdani method has been proposed.

Power generation by fossil-fuel resources has peaked, whilst solar energy is predicted to be at the vanguard of energy generation in the near future. Moreover, it is predicted that by 2050, the generation of solar energy will have increased to 48% due to economic and industrial growth [13, 14].

Indirect control, also known as the voltage-based maximum power point tracking, is used to get the most energy out of a solar array. A fuzzy logic-based control technique is then applied to ...

RELATED WORK Ms. Bhusari Priya Govind et al. [1] proposed an efficient way to power generation system, using hybrid piezoelectric solar power. Solar energy system is used to collect maximum power from sun. this proposal is to use the solar panels implemented in this project more efficiently and to carry out a realistic experimental approach to ...

The solar power generation capacity has increased by nearly 100 GWp in 2017, which is about 31 per cent more from 2017 [5, 6]. However, the extensive use of a PV system is not so common because of its high starting cost. ... INC, HC, fuzzy logic and neural network, cannot find the global MPP (GMPP) under partial shading condition (PSC) .

The power demand has been rising gradually because of various industrial developments, population growth. To fulfill the demand of power is a challenging factor for power generation based on fossil fuel alone and the various environmental issues like carbon...

The estimation of wind and solar power generation based on a modified fuzzy prediction interval using fuzzyregression (FR), firefly algorithm (FF), cultural algorithm (CA), genetic algorithm, and particle swarm optimization is developed in Ref. [19].According to this model, for a short prediction interval (less than 1 day), the GA-based fuzzy prediction model ...

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In this article, a fuzzy logic controller is developed for the proposed three-phase inverter system to extract the peak power of the solar panel-based generation system. Also, it is useful to maintain the constant grid voltage and frequency. The features of the...

The solar PV generated power 5 MW has been normalized using the base power of 219 MW according to the thermal power plant. A multi-layer feed forward neural network was trained using solar ...

The dispatch solar power with the FLC approach is mostly like the solar power before smoothing as there are no such fluctuations and the ramp rate is >7%/min in 559 min and <2%/min during all day. As shown in Figs. 14 and 15, the LPF filters the low fluctuation whereas the fuzzy approach does not work during the low fluctuations" interval. The ...

First, Hybrid power generation systems typically combine multiple sources of energy, such as solar panels, wind turbines, fossil fuel generators, and energy storage systems.

The widespread notion that the energy supply introduced in the industrialized countries represents the optimum in terms of energy management and hence should also serve as a Solar City: Reconnecting Energy Generation and Use to the Technical and Social Logic of Solar Energy HERMANN SCHEER 17 Chapter 1 Ch01-I045341 dd 17 1/22/2008 5:28:06 ...

A single source of electric power delivery to the consumer, local load is a diverse generation strategy such as conventional fossil fuel generation like oil, coal, etc. or renewable energy method such as solar, wind, hydro, biomass, geothermal, etc. Diesel or gasoline generators that are usually and commonly use in the rural areas are all categorized ...

Solar power plants are systems that use solar energy to generate electricity. They can be classified into two main types: photovoltaic (PV) power plants and concentrated solar power (CSP) plants. Photovoltaic power ...

Fuzzy Logic-Based Voltage Controller for Hybrid Off-Grid Pico-Hydropower and Solar Power Generation Systems Abstract: Pico-hydropower generators are one of the renewable power sources in a household or community if the supply of electricity seems to be in dire need. Nevertheless, the output voltage that they supply is occasionally unstable and ...

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The efficiency (i PV) of a solar PV system, indicating the ratio of converted solar energy into electrical energy, can be calculated using equation [10]: (4) i P V = P max / P i n c where P max is the maximum power output of the solar panel and P inc is the incoming solar power. Efficiency can be influenced by factors like temperature, solar irradiance, and material ...

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This chapter presents the important features of solar photovoltaic (PV) generation and an overview of electrical storage technologies. The basic unit of a solar PV generation system is a solar cell, which is a P-N junction diode. The power electronic converters used in solar systems are usually DC-DC converters and DC-AC converters. Either or both these converters may be ...

The dual-axis STS is an advanced system used for solar power generation, designed to maximize the energy collection efficiency of solar panels by continuously tracking the Sun"s position. ... T. Smart optimization of PV panel output using Fuzzy Logic Controller based solar tracker. Sinergi 2022, 26, 73-80. [Google Scholar] Chowdhury, M.E.H ...

Introduction. It is a remarkable time for solar power. Over the past decade, solar power has gone from an expensive and niche technology to the largest source of new electrical generation capacity added in the United States (in 2016 1).Solar power capacity in the United States increased nearly two orders of magnitude from 2006 to 2016 (), from generating less ...

Over the next decades, solar energy power generation is anticipated to gain popularity because of the current energy and climate problems and ultimately become a crucial part of urban infrastructure.

Solar power is the conversion of sunlight into electricity, either directly using photovoltaic (PV), or indirectly using concentrated solar power (CSP). The research has been ...

Fuzzy logic is integrated as pre-processing to ... Prediction of solar power generation is important in order to optimize energy exchanges in future micro-grids that integrate a large amount of ...