

Is fuzzy MPPT control suitable for photovoltaic power generation system?

50 % duty ratio. The entire system is designed, implemented and tested on a laboratory prototype PV array. The experimental results show the effectiveness and feasibility of the proposed system. Therefore the fuzzy MPPT control with SiC boost converter is more appropriate for photovoltaic power generation system.

How efficient is the photovoltaic power generation system based on fuzzy disturbance method?

Based on the experimental analysis, the photovoltaic power generation system's average efficiency based on the fuzzy disturbance method is recorded at approximately 97%. Table 1. Output results when light intensity varies, and temperature remain constant at 25 °C. Table 2.

Can a fuzzy logic controller be used for a solar cell?

The performance of the fuzzy logic controller is tested for stand-alone PV system under various operational conditions, such as changing solar radiance, temperature and load. The simulations are verified with experimental results. 2. Modelling Of Solar Cell A solar cell is the building block of a photovoltaic panel.

What is a fuzzy control system variable?

This study proposes a fuzzy control system variable, which includes the power change of the previous cycle  $D_{n-1}$  and the output variable during the current  $D_n$  output.

Can FPGA technology be used for photovoltaic system?

This paper presents the simulation and hardware implementation of fuzzy logic (FL) maximum power point (MPPT) controller with FPGA technology for photovoltaic system. The MPPT algorithm is implemented for a Silicon carbide (SiC) MOSFET based boost DC-DC converter which provides fast switching, low losses and high voltage gain.

What is a PV cell?

The PV cell is the most important part in the study of the MPPT algorithm. The study can be tracked and further research can be carried out only by establishing its accurate unit model. The circuit model of a PV cell is shown in Fig. 1. Circuit model of a PV cell.

This research focuses on improving MPPT performance in solar systems by employing the "Fuzzy Logic" control method. The simulation, which is run in MATLAB/Simulink, includes a detailed model of the entire system. The primary circuit is designed with a DC-DC Boost architecture and a single MOSFET transistor.

As output of photovoltaic batteries varies following the change to illumination, temperature and loads, it is necessary to do some researches on new control method of Maximum Power Point Tracking (MPPT) to guarantee high-efficiency output of photovoltaic batteries. In this document, a fuzzy control algorithm will be

adopted to present steps to ...

In this part the MPPT command adapted for the photovoltaic system under examination is presented, this system consists of a photovoltaic generator, a P & O type MPPT control based on fuzzy logic, as shown in Fig. 6. The photovoltaic system is PV generator type YGE 60 Cell Serie (YL245P-29b) is made of monocrystalline silicon consists of 60 photovoltaic ...

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logic control system. Block diagram of fuzzy logic control MPPT based photovoltaic power generation system is shown in Figure.12. The fuzzy theory based on fuzzy set and fuzzy algorithm provides a general method of expressing linguistic rules so that they may be processed quickly. The advantage of the fuzzy logic control is that it does not ...

This paper provides a small power photovoltaic control system based on fuzzy control with FPGA technology design and implementation for MPPT. The system composed of photovoltaic module, buck converter and the fuzzy logic controller implemented on FPGA for controlling on/off time of MOSFET switch of a buck converter.

Changes in factors such as light intensity and temperature can cause fluctuations in the power of photovoltaic cells. To solve this problem, this paper proposes a maximum power point tracking strategy (MPPT) based on fuzzy control. According to the fuzzy control algorithm, this paper determines the membership function and fuzzy rules ...

This study combines the traditional fuzzy control and incremental conductance methods by comparing the current maximum power point (MPP) intelligence with the traditional control algorithm ...

maximum power point tracking strategy (MPPT) based on fuzzy control. According to the fuzzy control algorithm, this paper determines the membership function and fuzzy rules, builds a fuzzy controller, sets up a photovo.

The simulation models of output power of photovoltaic cells based on perturbation and observation and fuzzy PID control are built. The simulation results show that the fuzzy PID control has the faster response, better stability and smaller overshoot.

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Modeling and simulation of fuzzy logic based maximum power point tracking (MPPT) for PV application. International Journal of Electrical and Computer Engineering, 8(3): 1315-1323. [10] Al-Gizi, A., Miry, A.H.,

Shehab, M.A. (2022). Optimization of fuzzy photovoltaic maximum power point tracking controller using chimp algorithm. International ...

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