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عنوان مقاله:

Daily Mobile Photovoltaic Energy Control for UAVs for Desert Area of Iran with Developed Convolutional Deep Neural Network based on Adaptive Fuzzy Sliding Mode Control

محل انتشار:

ششمین همایش بین المللی دانش و فناوری مهندسی برق، کامپیوتر و مکانیک ایران (سال: 1400)

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خلاصه مقاله:

Maximum Power Point Tracking (MPPT) is one of the approaches that improves the efficiency of photovoltaic cells (PV) with the load matching between their cells and the load. These mechanism used in Iran as the main performance evaluation of radiation forecasting. The key problem in Iran's photovoltaic systems is that it does not achieved much power and radiation which is due to the fact that the power of photovoltaic cells is affected by various weather conditions such as sun radiation and temperature or rainy and cloudy weather. So the Maximum Power Point (MPP) can be changed during the day and in the seasons especially in Iran. Therefore, it is essential to provide a suitable controller based on a method for performance evaluation in the field of energy and radiation which is called the Maximum Power Point Tracking. The aim of this work is applying an isotropic method based on adaptive fuzzy sliding mode controller with developed Convolutional Deep Neural Networks to optimize MPPT of Iran's photovoltaic systems in desert area climate condition for UAVs, so these UAVs can use such energy for any acivity. The case study is Shahrood city in Iran which is a desert area with special climate with photovoltaic renewable energy in UAVs. A new deep learning model based on recurrent convolution created named Long Short Term Memory - Atrous Spatial Pyramid Pooling (LSTM-ASPP). The main reason to propose this method is some defects in previous controllers such as low stability, sensitive to a high frequency noise and low efficiency and of course, for optimizing energy and radiation for predicting daily energy consumption and production. Simulation done in MATLAB platform in command window and Simulink. The results reveal that the proposed controller which name adaptive fuzzy sliding mode LSTM-ASPP has more efficiency and better dynamic response in comparison to other methods

کلمات کلیدی:

Photovoltaic (PV), Maximum Power Point Tracking (MPPT), Wind Energy, Solar Radiation, Adaptive Fuzzy Sliding Mode Control, Deep Learning, UAV

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