

In this paper, the octonion neural network is investigated to forecast the short-term solar irradiance. The previous and the next eight values solar irradiance are organized into two octonion values; thereby the network could be constructed. This method not just gives the opportunity to forecast eight values ahead solar irradiance using one octonion input but also takes all the advantages of the octonion domain. The octonion input contains the past values solar irradiance which produces dynamics naturally to the network and decreases the input dimension vector. The octonion training algorithm has eight dimensions rather than one dimension in the real-valued neural networks. Comparison with the real-valued neural networks for forecasting solar irradiance shows that the proposed method is promising to deal with such problem. The optimal structure is used to manage the an autonomous photovoltaic (PV) system that contains the PV modules and the battery bank. The use of the proposed method presents benefits for the number of the used modules and for the battery energy requested as well