ABSTRACT

Solar tracking plays a vital role in the electricity generation from the solar lights. Solar panels generate the energy based on the light intensity, electromagnetic radiation and the load level given to them. To improve the energy productivity rate, solar panel needs to be moved and fixed in the correct angle to observe the sun light. However, deciding the angle and place of the solar panels is most difficult task where the sun is moving from day to night continuously. In the proposed research novel tracking system is implemented which focus to track the sun moving behaviour and the energy productivity rate based on which angle and location of the solar panels would be decided optimally.

Hybridized Improved Genetic algorithm with Differential Evolution Function (HIG-DEF) for the optimal decision of angle and location of the solar panels is the first proposed methodology. This proposed methodology would evaluate the fitness value adaptively based on past, present and future heuristic information. Thus the optimal and accurate identification of angle and location can be found.

In the second proposed methodology, Hybridized BAT with Differential Evaluation or tracking solar panels angles and location to amplify the electricity generation rate. The fitness value for tracking is enumerated by diverse methods and the finest fitness value is progresses by the output and learning methodology all the modules utilized in obtaining fitness value contains its merits depend on the input conditions. The proposed research methodology results in providing the good simulation result in terms of identifying the most optimal angle and location of the solar panels.
In the third proposed methodology, to maximize the power generation Dynamic Programming based on Policy Iteration (DPPI) Algorithm is introduced to find the optimal values of angle and location of solar devices. Then Single-Stage Balanced Forward Fly back Converter (SSBFFC) is used for balancing the voltage power which are imbalanced when it is observed from the solar directly. Finally battery lifetime performance is improved by using three stage charging technique which would optimize the storage performance, thus the lifetime of battery cells can be improved.

The overall evaluation of the proposed research work is conducted in the MATLAB simulation environment from which it is proved that the proposed research technique leads to provide the optimal outcome than the existing research methods in terms of increased accuracy.