ISSN: 2320-5407
International Journal of Advanced Research
Publisher's Name: Jana Publication and Research LLP
www.journalijar.com

REVIEWER'S REPORT

Manuscript No.: IJAR- 58736

Title: Bridging Conventional and Intelligent MPPT Techniques: A Hybrid ANN-P&O Approach for Smart Photovoltaic Systems,

Recommendation:
Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality	Yes			
Clarity	Yes			
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

Detailed Reviewer's Report

Reviewer's Comment for Publication.
Acceptance Comment are mentioned below suitable for the paper titled "Bridging Conventional and Intelligent MPPT Techniques: A Hybrid ANN-P&O Approach for Smart Photovoltaic Systems"

Reviewer Comments: Accept

Reviewer Comments –

1. Introduction

The manuscript addresses an important problem in photovoltaic maximum power point tracking (MPPT). The proposed hybrid ANN-P&O strategy is relevant to intelligent and efficient PV energy conversion. The study clearly motivates the need to overcome the limitations of conventional P&O under rapidly changing irradiance. The research objectives and application of a 250.27 W PV module with a Buck converter are appropriate. Overall, the introduction provides a clear foundation for the proposed work.

2. Literature Review

The manuscript provides an appropriate background on conventional P&O and intelligent ANN-based MPPT techniques. The limitations of P&O, particularly oscillations and slow response, are clearly identified. ANN-based tracking is suitably introduced as a faster alternative for estimating the maximum-power-point voltage. The proposed combination of ANN prediction and P&O refinement provides a logical extension of existing approaches. The literature discussion adequately supports the motivation and relevance of the proposed method.

3. Solution Approach

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The proposed ANN-P&O control strategy is technically logical and well structured. The ANN estimates the maximum-power-point voltage using irradiance and temperature, while P&O performs local refinement. The 20 kHz discrete simulation with a Buck converter provides a suitable platform for evaluating dynamic performance. The bounded correction mechanism is appropriate for improving tracking accuracy without significantly affecting response speed. The methodology is sufficiently clear and supports the objectives of the study.

4. Results and Discussions

The results demonstrate significant improvement over conventional P&O under the selected irradiance profile. Conventional P&O shows power ripple of up to 44 W and response times exceeding 100 ms, whereas the ANN responds within a few microseconds. The close agreement between ANN and hybrid ANN-P&O results is reasonable because the ANN was trained using the same PV model. The authors appropriately identify out-of-model testing as necessary to quantify the additional benefit of P&O refinement. Overall, the results adequately support the main claims of the manuscript.

5. Conclusion

The manuscript presents a relevant and effective hybrid MPPT strategy for photovoltaic systems. The combination of ANN prediction and P&O refinement provides a promising approach for achieving fast and accurate MPPT. The simulation results demonstrate clear advantages over conventional P&O in terms of response time and power-tracking behavior. The study is technically sound and has practical relevance to smart PV energy systems. Therefore, the manuscript is recommended for ACCEPTANCE.