

PV Charging Station based on a Hybrid Boost Converter with a Modified Control for Three Phase System

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Abstract: -In this paper, we are studying PV Charging Station based on a Hybrid Boost Converter with a Modified Control for ThreePhase System. We are improving the execution of three stage hybrid converter for a PV charging station by the utilization of ANN based control plot. The hybrid boost converter is actually decreasing the different stage dc-dc converter and dc-ac converter stage to a single stage hybrid boost converter. This essentially improves the execution my reducing the number of stages and for the reducing the switching misfortunes in the circuit for hybrid converter. The framework comprises of hybrid plug in electric vehicle input and furthermore a three stage AC lattice is attached. The MPPT system is likewise connected for the PV charging station. With the utilization of ANN, it is seen that the framework is improved in execution and is a solid framework. The control system essentially comprises of the ANN (Artificial Neural Network) control procedure for power the execution and results.

Keywords: - PV charging, Boost Converter, three phase

Introduction: -

Artificial Neural Network "ANN" has been associated successfully to a wide extent of control system applications of late. Counterfeit neural networks have high learning and nonlinear mapping encapsulations and its parallel and passed on structure can give a nonlinear mapping among inputs and yields of an electric drive system, without the information of any predetermined model. This settles on ANN an average choice to be used in the change segment of a MRAC system. [11] [12]. The ANN is in a general sense introduced from the subject of science where neural network plays an essential and key occupation in human body. In human body work is finished with the help of neural network. Neural Network is just a inter related neurons which are millions in number. With the help of these interconnected neurons all the parallel processing is done in human body and the human body is the best instance of Parallel Processing. [5] . In this work, a speed control system for Hybrid converter for PV charging is proposed using a model reference adaptable controller subject to Artificial Neural Networks. The displays of the proposed ANN drive structure and the standard PID control are arranged and executed using MATLAB Simulink propelled processor and surveyed under different operating conditions, for instance, sudden burden impact, parameter assortments, etc. [7][9]

All past research on HBC controller design accept that the hybrid converter is related with a strong dc voltage source. Along these lines, the capacity of most prominent power point tracking (MPPT) for PV systems isn't yet created for HBC. [3][8] Despite the fact that MPPT figuring exists in the writing, the application is mainly for a dc/dc converter (e.g.,) or a dc/ac converter (e.g.,). Use of MPPT in HBC has been investigated using incremental conductance. This execution is certainly not a noteworthy issue since it requires a cautious understanding on HBC switching instrument and the coordination of MPPT work and the vector control work. [12] In solicitation to diminish the amount of switching stages, the inverse Watkins-Johnson technique is supplying power in the meantime to dc and ac loads. Single-stage and three-time of hybrid converters (HBC) that can integrate a dc power source, dc burdens and ac loads for a microgrid Recent research in like manner recommends that a hybrid single-stage converter can be associated in grid related applications. [4][5]

The impact is examined and proposed on hybrid converter with ac age and plug in electric vehicle for PV charging station. Figure 1 and 2 demonstrates actualized model and its procedure.

Implementation and Results of Hybrid Converter Model for ANN based:

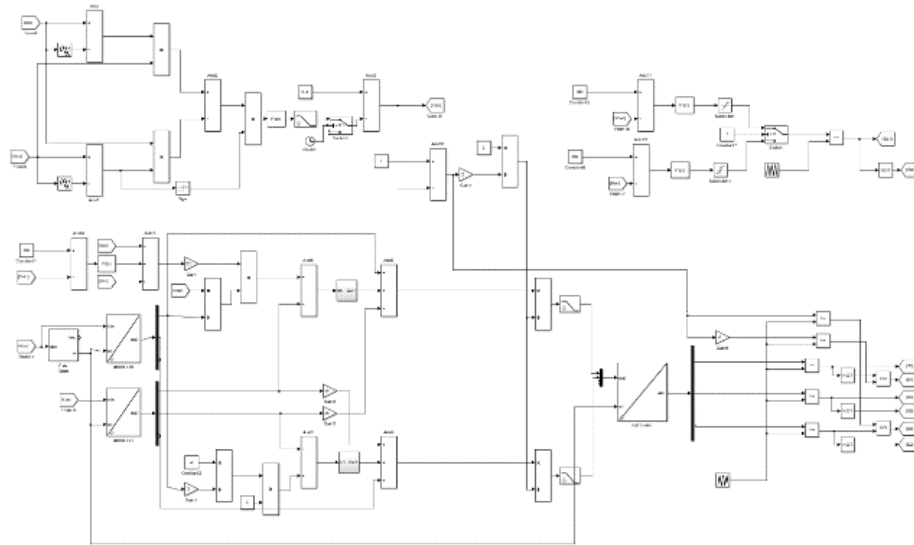


Figure 1: Control scheme based on ANN

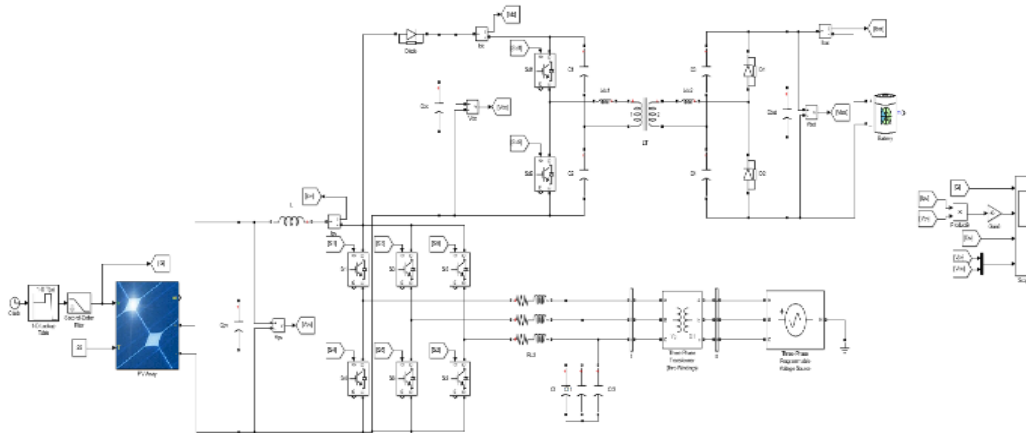


Figure 2: Model for hybrid PV charging station

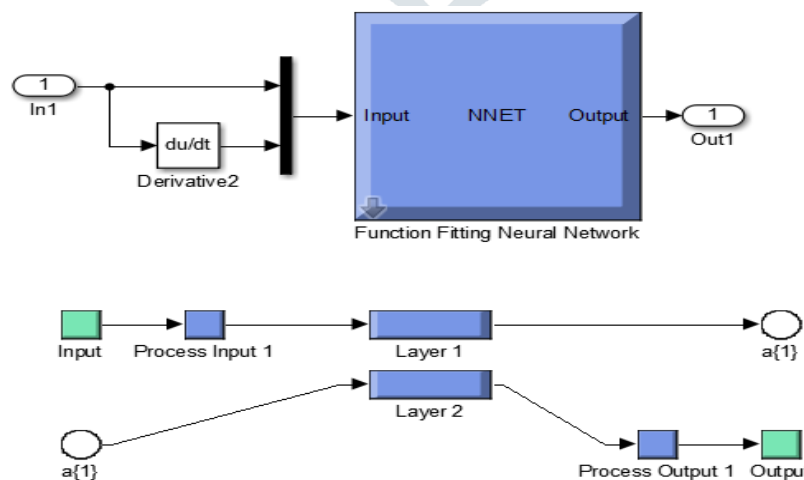


Figure 3: ANN Subsystem

ANN is a structure consist of solidly interconnected neurons which can modify clear processing parts (named as hidden neurons or hidden points) that are prepared for performing significantly parallel counts for information processing and learning depiction. Disregarding the fact that ANN is the main abstractions of the natural accomplices, the ANN isn't to recreate the activity of the common systems yet to use what is known as the convenience of the characteristic networks for resulting the complex issues regular PI controlled DSTATCOM.

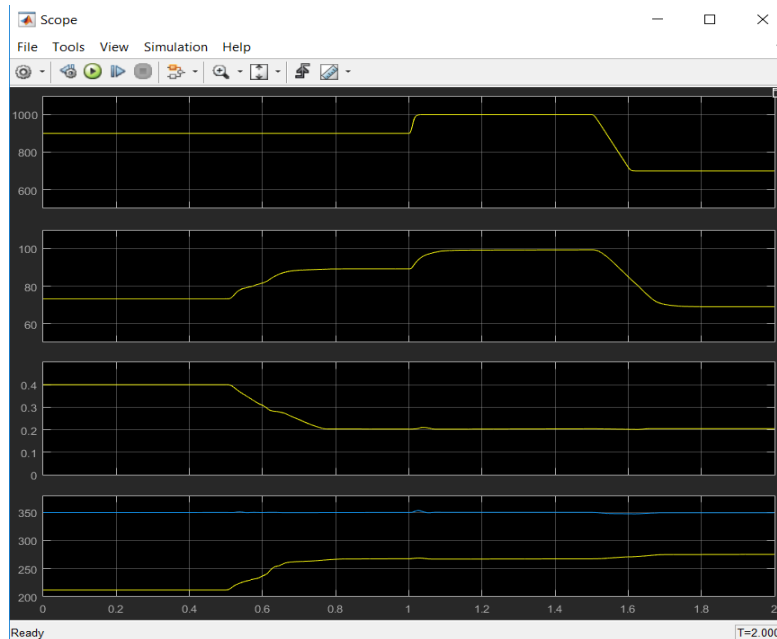


Figure 4: Performance of IC – ANN based sytem

In figure 4, it is seen that the performance of IC –ANN is better than of PI as the outputs are flicker free in case of ANN based systems.

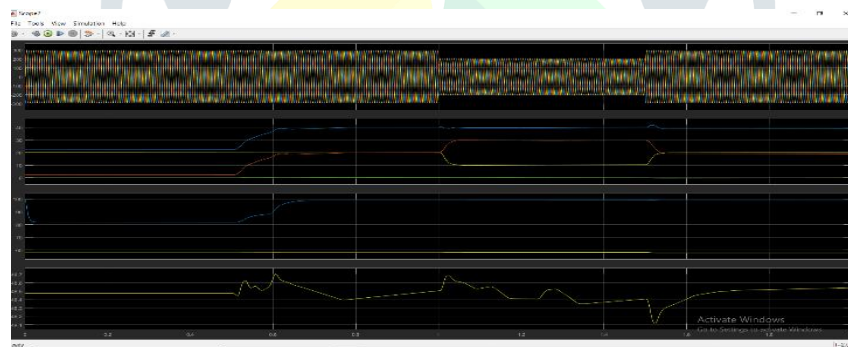


Figure 5: System performance for ANN based technique

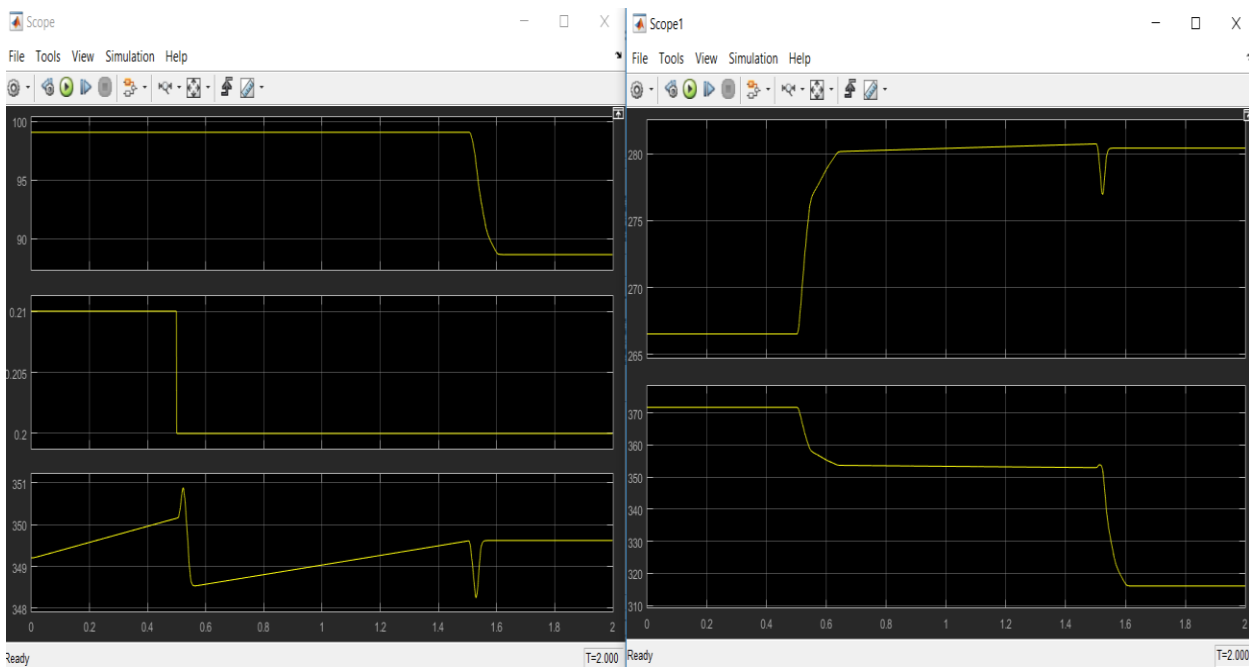


Figure 6: Performance of ANN based system for reactive power

From figure 5 to 10 all performance results are mentioned.

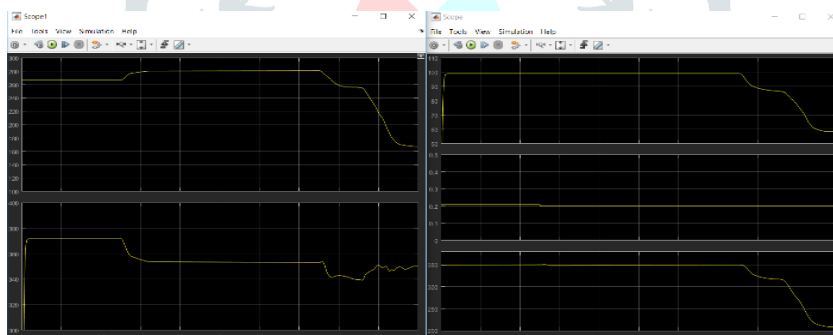


Figure 6: Performance of ANN based system for DC voltage control

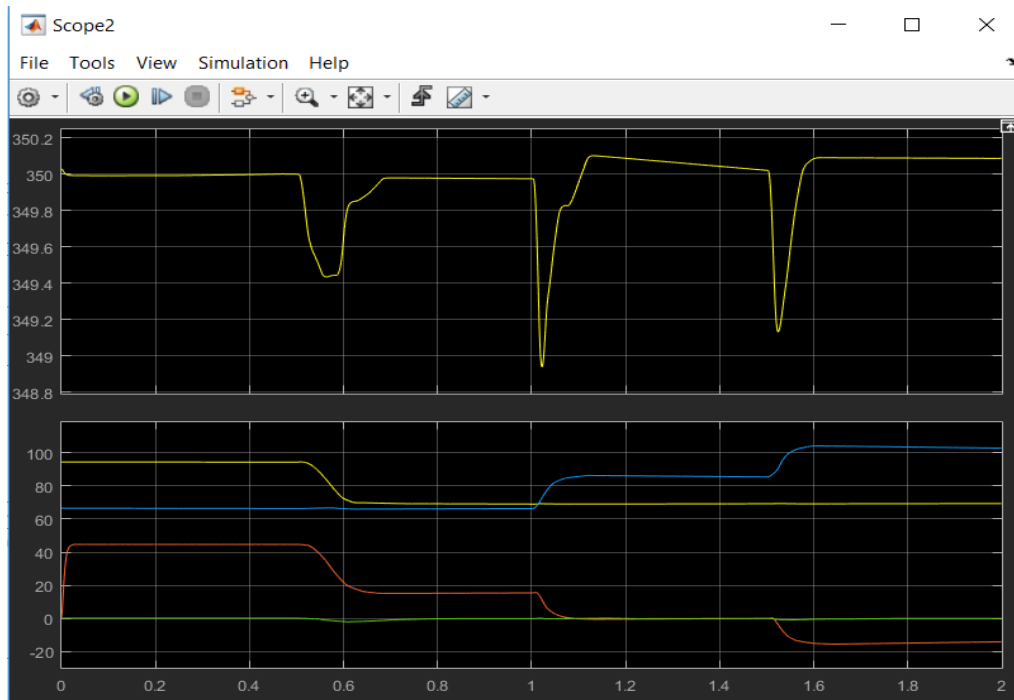


Figure 7: Performance of ANN based system for Power Management

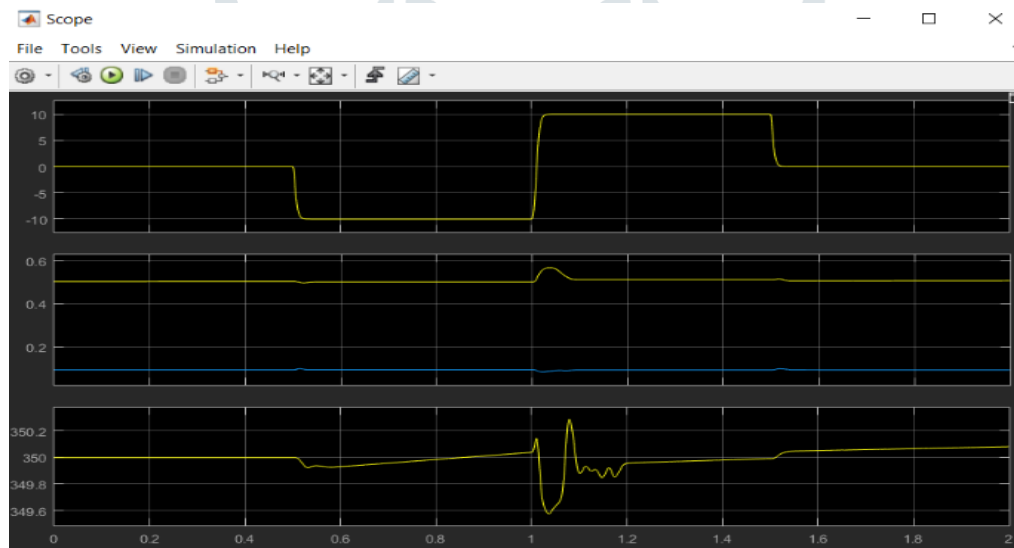


Figure 8: Performance of ANN based system for Md, Mq and VDC

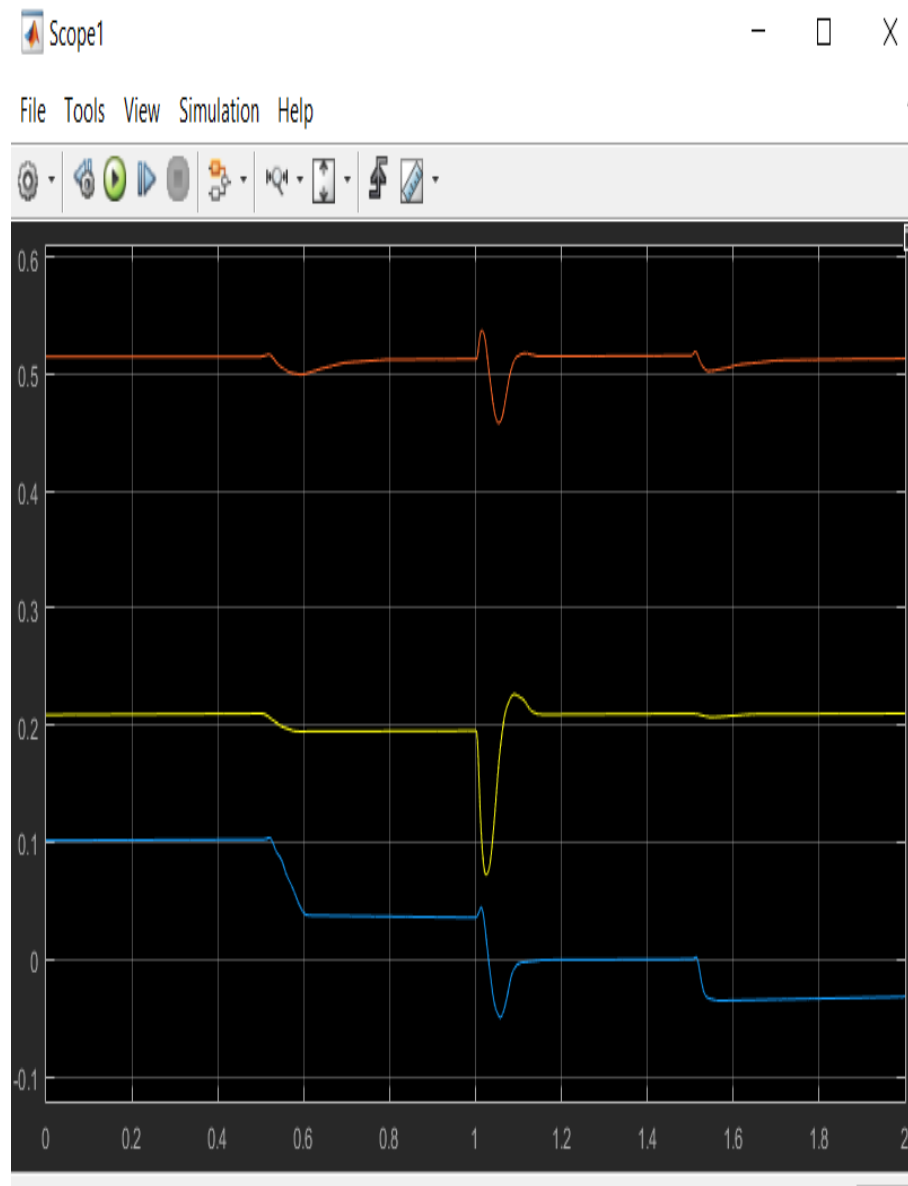


Figure 9: Performance of ANN based system for Dsd, Md and Mq

Conclusion: The MPPT control utilizes modified incremental conductance-ANN based MPPT methodology. The dc voltage guideline and reactive power tracking are acknowledged using vector control. A PV integrated EV charging station furnished with a help battery and with intelligent imperativeness the board can about eliminate the station's pinnacle power solicitation and decline the essentialness exchange with the utility structure by a factor of 2. The assessed PV power subject to the extracted atmosphere information reflects the actual PV power age. Increasingly tangled PV power forecasting models with continuously accurate hour-by-hour atmosphere information could improve the accuracy of the evaluated PV power. The three-stage HBC can save switching mishap by integration a dc/dc converter and a dc/ac converter into a single converter structure. A control for the three-stage HBC is intended to achieve MPPT, dc voltage guideline and reactive power tracking.

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