Date: 14 June 2021

Dear ICIC Express Letters Editor,

Thank you for considering our paper entitled by 'Comparison performance between TFFN and RBF neural network for the optimal output power of Silicon Technology based Photovoltaic (PV) panels', Reference No.: ICICEL-2105-017; Author(s): Syafaruddin, Gassing and Faizal A Samman, in the publication of ICIC-*Express Letters*.

We would like to thank to reviewers for the beneficial comments and suggestions in order to improve the quality of the paper. We have revised our paper according to the ICIC-EL template and answered the following the reviewer comments as shown in the bold font as follows:

Best regards,

Syafaruddin

Universitas Hasanuddin, Indonesia

The paper is generally well written and organized. The results presented in the paper seem correct, and potentially useful in practice. The techniques employed to tackle the problems are generally standard with some novelties. The paper can be accepted for publication subject to some necessary minor changes as below.

Thank you for your beneficial comments and suggestion to improve the quality of our paper.

Answer for Reviewer Comments:

1) This manuscript is a little longer than the page limit of ICIC-EL. A manuscript should not exceed 8 pages in ICIC-EL format.

The length of the article has been shortened to not exceed 8 pages in ICIC-EL format.

2) Abbreviations should not be used in the title generally if not unavoidable.

The title has been modified with by removing the abbreviation to make clear understanding the purpose of this article as follows:
'Radial Basis Function and Three-Layered Feed-Forward Network for the Optimal Output Power of Photovoltaic Modules'

3) The review on existing studies is not enough. It has been found that no reviewed references are published in recent years; therefore, the motivation of this work, that is, why to investigate the comparison performance between TFFN and RBF neural network, can't be justified.

The literature review of this article has been improved by adding the related references in the last five years, including the information why the study of RBF and TFFN is justified. Please find the additional paragraph of our paper as follows.

The purpose of this research is to compare the performance of artificial neural networks namely radial basis function (RBF) and three-layered feed-forward neural network (TFFN) to estimate the maximum power of different photovoltaic modules based on Silicon crystal technology. In other researches, the RBF and TFFN are still popular and fundamental methods either as a single method or a hybrid method amongst the artificial neural network methods in solving the uncertainty factors in prediction the engineering parameters. The radial basis function has been used to avoid the uncertainty factors regarding the scheduling operation in prediction the output power of photovoltaic generation systems [7]. Similarly, the RBF network has been utilized to determine the most influencing factor of climate inputs, such as the solar intensity on module surface and rising temperature on backside surface in order to predict the daily energy generation of photovoltaic systems [8]. Also, the RBF neural network has been effectively applied to tracking the optimal power point for the efficient energy production and improved efficiency performance of photovoltaic panels [9]. Meanwhile, the combination of particle swarm optimization and feed-forward neural network has been implemented to determine the optimal amount of bioenergy for the improved performance of microgrid systems [10]. Likewise, the scheme of training process in feed-forward neural network is improved with particle swarm optimization method in order to achieve high accuracy performance, optimal model topology and computation effort reduction in photovoltaic system application [11].

Following the previous literatures, the performance investigation of these two artificial neural networks is important in addition to diversification methods based on artificial intelligence and to recommend any type of artificial neural network structures for specific application based on the consideration of simple structure, flexibility of training process and the level of accuracy during training and validation process. In our study, the electrical characteristics of photovoltaic module based on Silicon crystalline technologies are basically the same where they have a negative voltage-temperature coefficient. This behavior tends to produce the output power of PV module drops significantly. Therefore, the comparison performance of artificial neural network method can be used in another part of the integrated research applications based on engineering measurements of estimation, prediction and control.

[7] Shota Ogawa, Hiroyuki Mori, 'Integration of Deep Boltzmann Machine and Generalized Radial Basis Function Network for Photovoltaic Generation Output Forecasting', IFAC-Papers Online, Vol. 53, Issue 2, pp. 12163-12168, 2020

[8] Amit Kumar Yadav, Vikrant Sharma, Hasmat Malik, S.S.Chandel, 'Daily array yield prediction of grid-interactive photovoltaic plant using relief attribute evaluator based Radial Basis Function Neural Network', Renewable and Sustainable Energy Reviews, Vol. 81, Part 2, pp. 2115-2127, January 2018

[9] Surabhi Chandra, Prerna Gaur, Diwaker Pathak, 'Radial basis function neural network based maximum power point tracking for photovoltaic brushless DC motor connected water pumping system', Computers & Electrical Engineering, Vol. 86, September 2020

[10] Cristian Chiñas-Palacios, Carlos Vargas-Salgado, Jesus Aguila-Leon, Elias Hurtado-Pérez, ' A cascade hybrid PSO feed-forward neural network model of a biomass gasification plant for covering the energy demand in an AC microgrid', Energy Conversion and Management, Vol. 232, March 2021

[11] Sadeq D.Al-Majidi, Maysam F.Abbod, Hamed S.Al-Raweshidy, 'A particle swarm optimisation-trained feedforward neural network for predicting the maximum power point of a photovoltaic array', Engineering Applications of Artificial Intelligence. Vol. 92, June 2020

4) In the end of the Introduction, the organization of this paper is recommended to be summarized to make the structure clear.

It has been added the structure of our article at the end of Section 1: The article is organized as follows. The importance of comparison performance of RBF and TFFN has been shown in this section 1. In Section 2, the technical specification of PV modules is presented. Section 3 provides the information of RBF and TFFN neural network modelling. Following in Section 4, the simulation results and discussion are presented. Finally, Section 5 shows the conclusion of this study.

5) From Section 3, we know RBF and TFFN basically have the same structure as shown in Figure 1; however, it is mentioned that there appear some differences between the two, which are not clearly shown in the figure.

The Figure 1 has been modified in order to show the consistency explanation and to distinguish the difference between the two structures of artificial neural networks.

6) It is suggested to improve the resolution of figures, and due to black-and-white print, curves in different colors should be improved to be more differentiated.

The quality of figures has been improved to make the curve can be distinguished and to make it clear when printed in black and white.

7) Future study included in simulation results and discussion should be shortened and combined into the Conclusion part.

The future study has been elaborated in the Conclusion part in order to shorten the article.

8) No recently published references are cited; therefore, it is suggested to cite up-to-date references from mainstream journals, for example, the paper titled “Integration of Solar Tracker and Maximum Power Point Tracking for Improving Photovoltaic (PV) System Efficiency” in International Journal of Innovative Computing, Information and Control, vol.16, no.2, pp.429-443, DOI: 10.24507/ijicic.16.02.429, 2020.

The literature review of this article has been improved by adding the related references in the last five years including the recommended article.

9) There are several ill-formed expressions existing in the manuscript, which need further improvement, such as "By using artificial neural network methods, no need any internal

knowledge of systems", "The advantages thin-film photovoltaic module is the reduces production costs of multi/mono crystalline technology" and "The consequence of this approach where the same weight value every time the training process is never repeated".

Thank you for this beneficial comment to improve the quality of our paper. The language problems have been properly checked and corrected.
