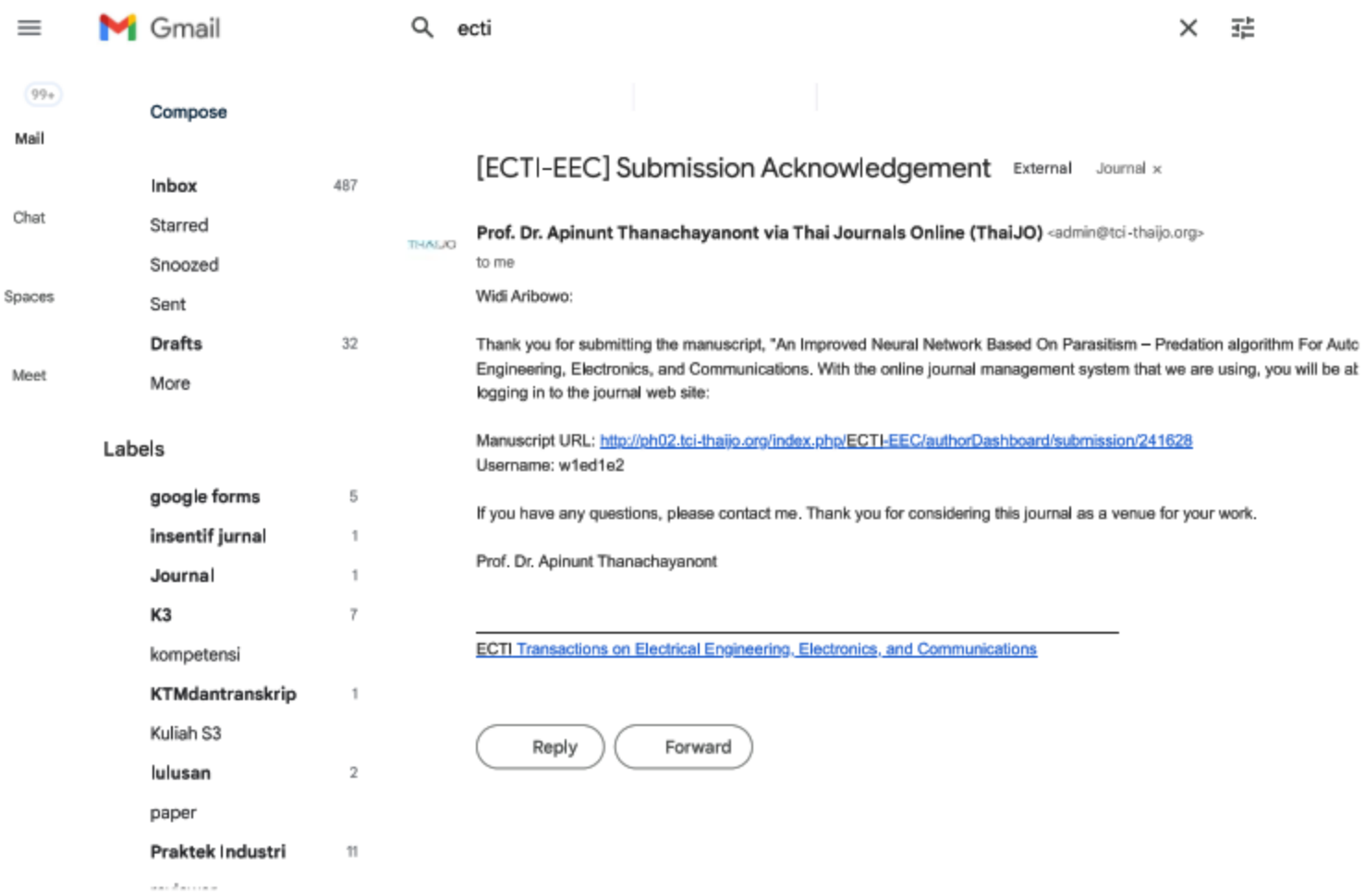
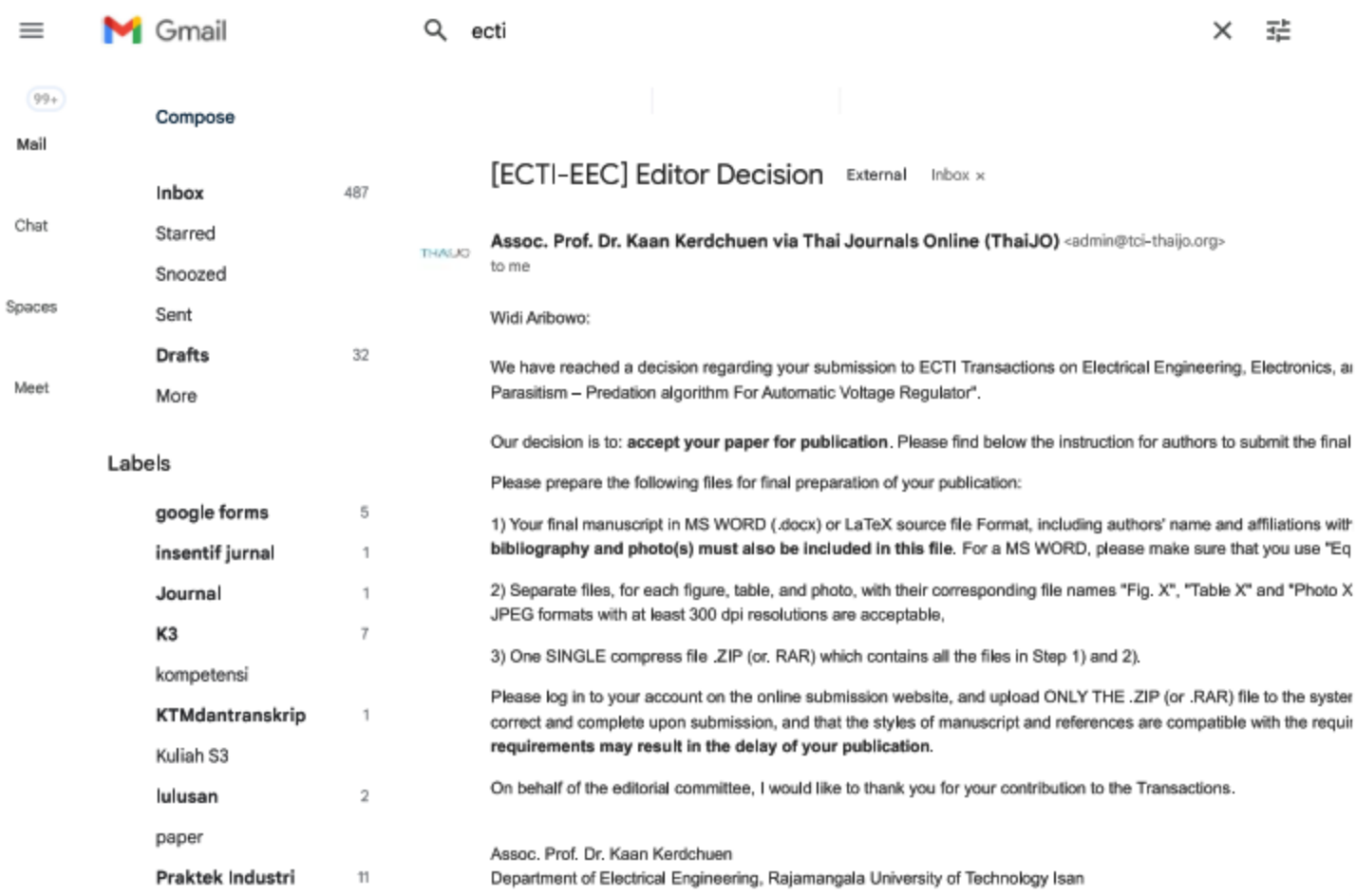
Bukt korespondensi Dan Peer Review

1. Email Pertama Submitted Paper



2. Email Review Tahap 1



Reviewer B:
Recommendation: See Comments

Comments to Authors (Mandatory)

(Please provide constructive and helpful feedback to guide the authors in understanding the shortcomings and indicate

- In abstract, the result of this work must be described briefly.
- Please improve Table 1.
- Please check spelling words.
- Future works as an integral part should be included in the Conclusions.

Reviewer C:
Recommendation: Accept Submission

Comments to Authors (Mandatory)

(Please provide constructive and helpful feedback to guide the authors in understanding the shortcomings and indicate

there are some word misspelling, check it out

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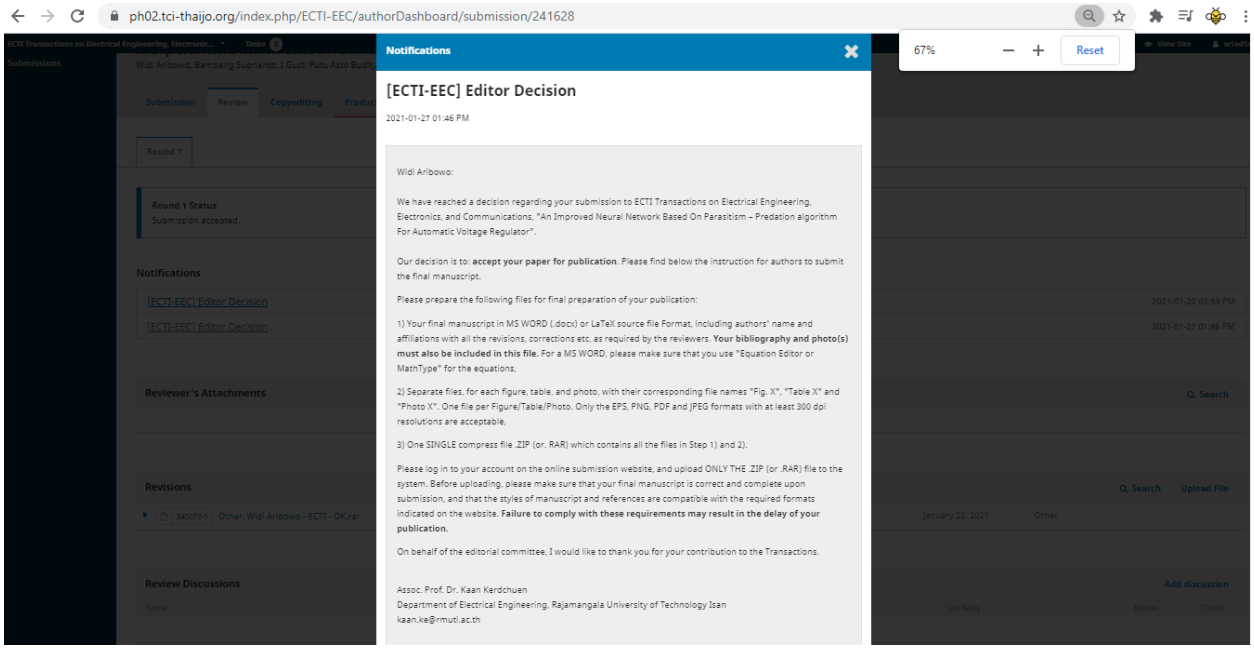
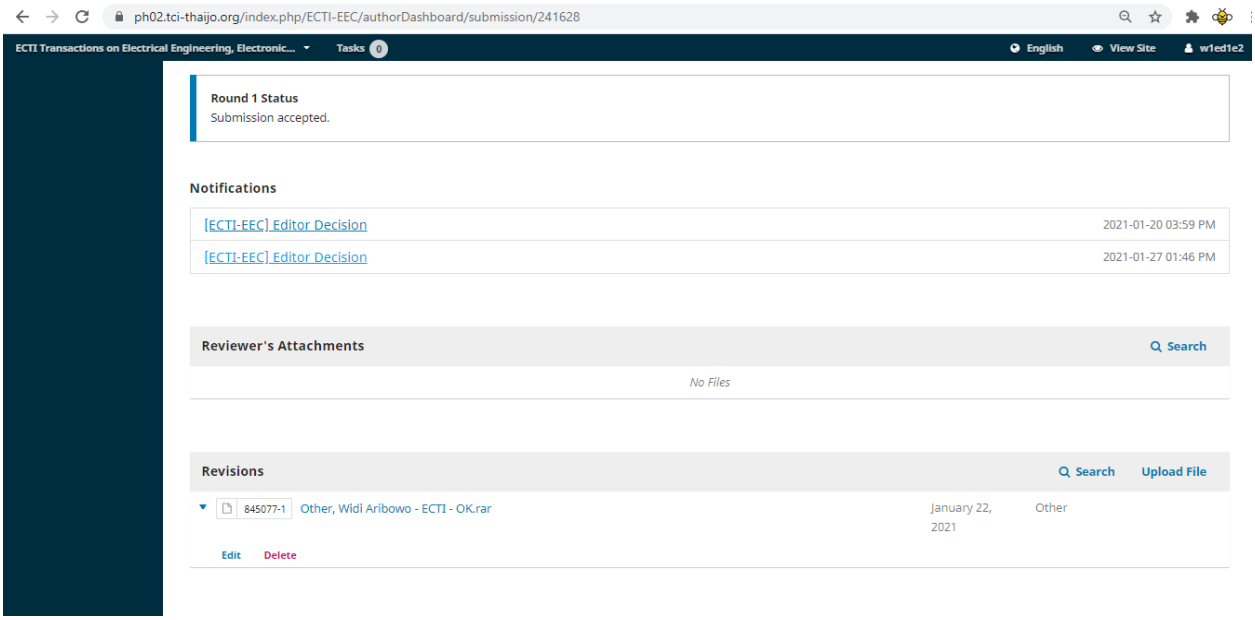
3. Hasil Review dan penerimaan artikel. Dan meminta menyesuaikan sesuai format untuk final manuscript



4. Pengiriman Final Manuscript



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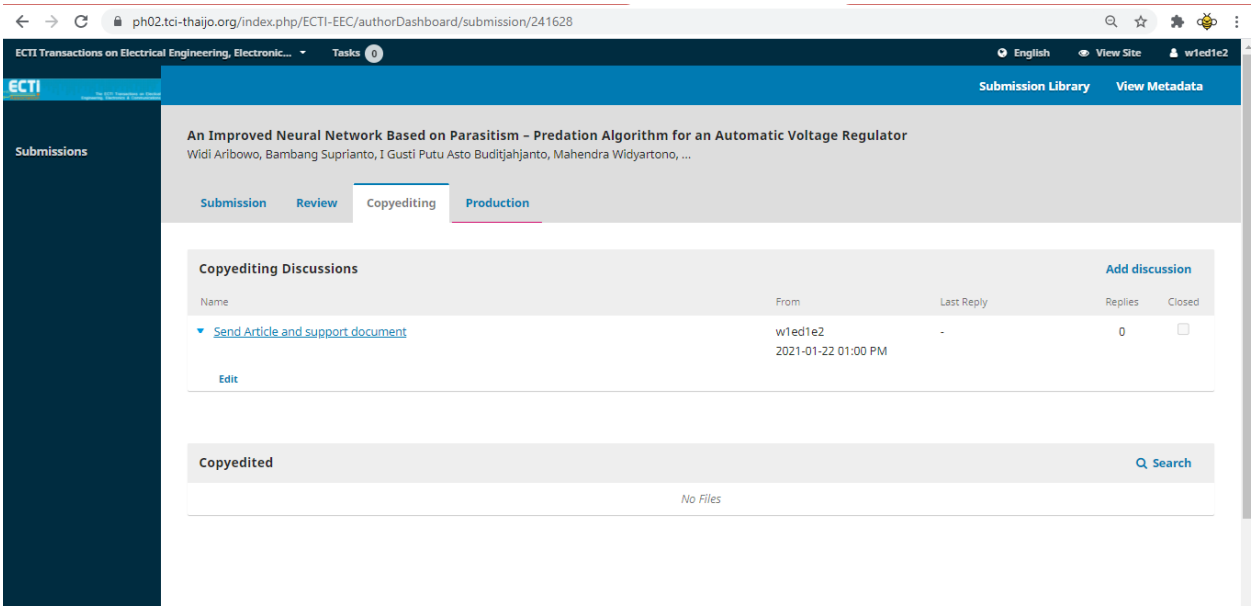
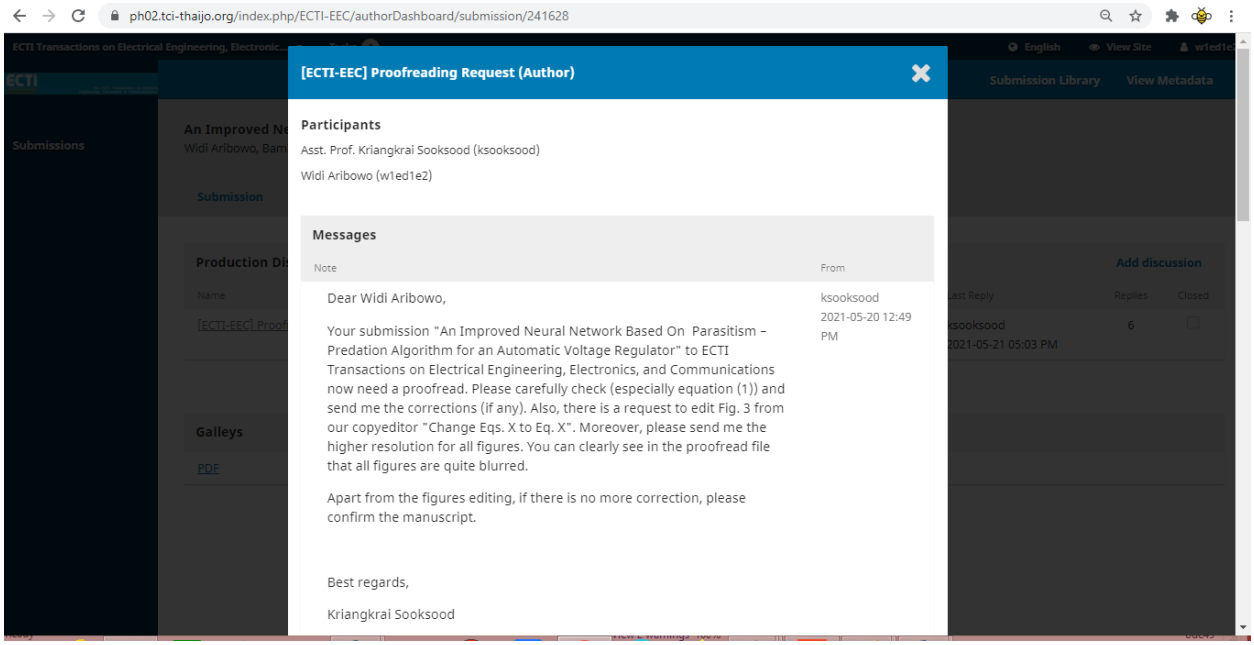


6. Proses **Production** dan proofreading dengan melakukan beberapa bagian yang menjadi catatan



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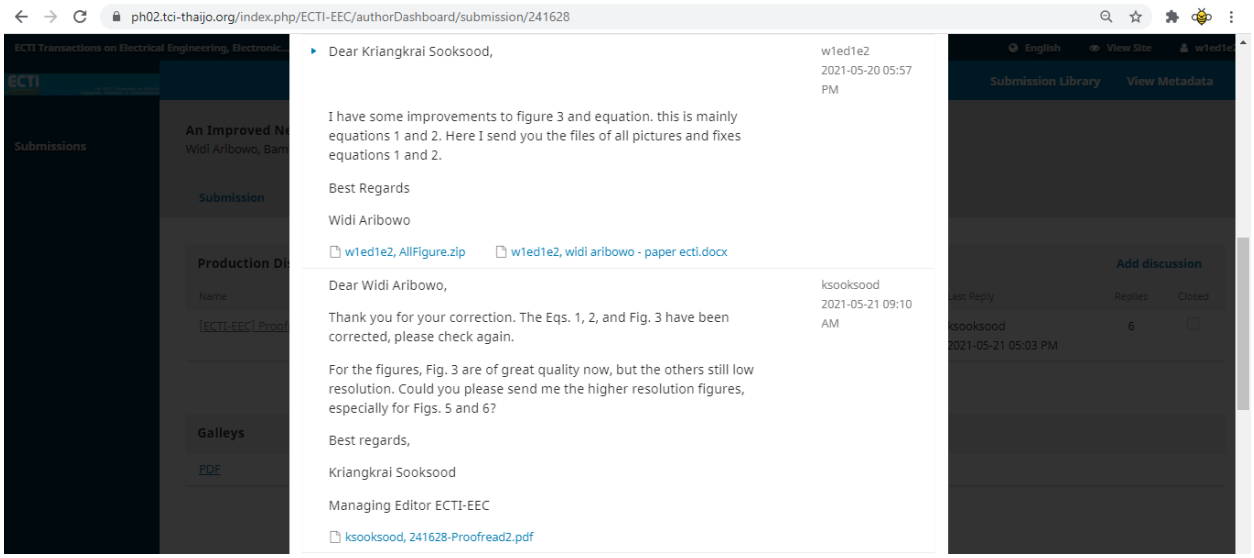

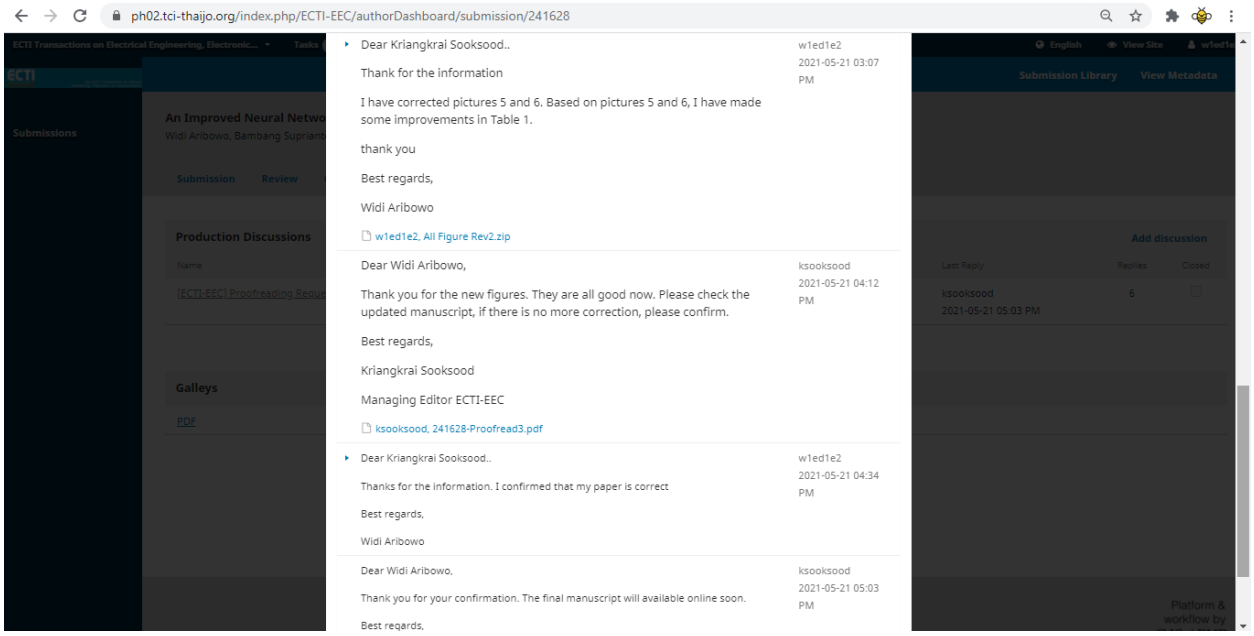

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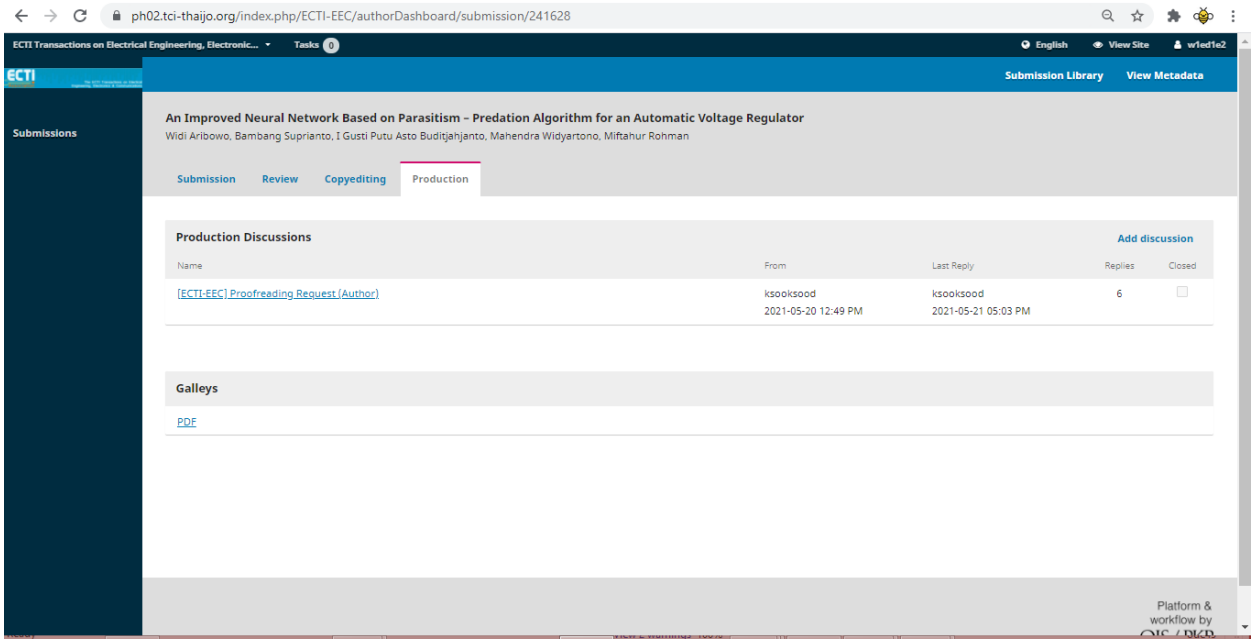

9. File PDF

An Improved Neural Network Based on the Parasitism – Predation Algorithm for an Automatic Voltage Regulator

Widi Aribowo†, **Bambang Suprianto**, **I Gusti Putu Asto Buditjahjanto**, **Mahendra Widyartono**, and **Miftahur Rohman**, Non-members

ABSTRACT

The parasitism – predation algorithm (PPA) is an optimization method that duplicates the interaction of mutualism between predators (cats), parasites (cuckoos), and hosts (crows). The study employs a combination of the PPA methods using the cascade-forward backpropagation neural network. This hybrid method employs an automatic voltage regulator (AVR) on a single machine system, with the performance measurement focusing on speed and the rotor angle. The performance of the proposed method is compared with the feed-forward backpropagation neural network (FFBNN), cascade-forward backpropagation neural network (CFBNN), Elman recurrent neural network (E-RNN), focused time-delay neural network (FTDNN), and distributed time-delay neural network (DTDNN). The results show that the proposed method exhibits the best speed and rotor angle performance. The PPA-CFBNN method has the ability to reduce the overshoot of the speed by 1.569% and the rotor angle by 0.724%.

Keywords: Parasitism – Predation Algorithm, PPA, Cascade-Forward Backpropagation Neural Network, Automatic Voltage Regulator, Neural Network, Elman Recurrent Neural Network

1. INTRODUCTION

Currently, electricity plays a strategic role in everyday life, influenced by every piece of equipment requiring electricity in homes, offices, companies, and factories [1]. The electrical power system is designed to operate at a set nominal value. Supply voltage experiencing a shift in behavior results in uncertain behavior and impacts the lifetime of equipment.

Irregular demand for loads that can change at any time, results in the performance of electrical power systems approaching unsafe limits. The electrical power system control is an important element in generation fulfillment. Besides, the burden also needs to increase in complexity. The generator can oscillate around a balanced state when disturbed such as load changes, turbine fluctuation, and other factors. This is extremely dangerous for the electrical system. Most synchronous generators are installed with an excitation system, controlled by an automatic voltage regulator (AVR) to maintain the dynamic stability and power quality of the power system. The AVR functions as the main controller of the excitation system and can maintain the generator terminal voltage under any conditions [3]. The basic foundation of the AVR system is stable and responsive to changes in load. An automatic AVR is a buffer for the output voltage at a pegged level under various conditions.

Complex power systems need good AVR performance. Various approaches to setting automatic voltage regulators are reported in the existing literature; the predominant two types being conventional and computational. The conventional approaches often used in the AVR arrangement are the Cohen-Coon and Zeiglar-Nicholas [4].

In conventional methods, the controller becomes a problem when adjusting the gain from light to severe conditions. This is because settings in one load condition may differ in others. Due to the complex and non-linear adjustment of the AVR, a soft computing algorithm is implemented in this study to adjust the parameter acquisition.

Several computational methods have started to be