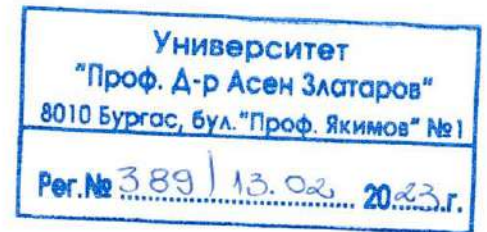


REVIEW



for Ivan Dimitrov Torlakov's dissertation on the subject
"Application of high-performance systems for modeling sustainable processes in Cohen-
Grosberg type neural networks"
for the acquisition of the educational and scientific degree "Doctor" in the doctoral
program "Computer systems and technologies", professional direction: 5.3. "Communication and
computer technology", scientific area 5. Technical sciences
by Prof. Sotir Sotirov from the University "Prof. Dr. Asen Zlatarov", Burgas

Pursuant to order UD No. 330 of 05.12.2022 of the rector of the University "Prof. Dr. Asen Zlatarov"- Burgas, Prof. Dr. Magdalena Mitkova, I am designated as a reviewer of
the dissertation work of Ivan Dimitrov Torlakov on the topic "Application of high-
performance systems for modeling sustainable processes in Cohen-Grosberg type neural
networks"

Brief biographical data

Ivan Dimitrov Torlakov was born on August 27, 1993. In 2016, OKS Bachelor at the Technical University of Sofia, Engineering and Pedagogical Faculty - Sliven, and in 2019. completed his master's degree at the University "Prof. Dr. Asen Zlatarov" Burgas. From 2017 to 2019, he was a web designer at Sliven Net OOD, and from 2019 he was a software application programmer at Sliven Net OOD.

Description

Ivan Torlakov's dissertation is 151 pages long and consists of an introduction, three chapters, a conclusion containing a description of the contributions in the dissertation, a list of publications on the dissertation, a bibliography with 123 titles, lists of figures, tables and algorithms, as well as applications.

The first chapter is called Neural Networks and contains: short history; models of the neural networks; description of artificial neural networks, concurrent neural networks, recurrent neural networks, selforganizing maps, Grossbeg maps Coen-Grossberg networks.

The second chapter is devoted to the following:

The fourth chapter is about algorithms and implementation of stability Coen – Grossberg neural networks.

Actuality

Neural networks, as one of the parts of artificial intelligence, is one of the fastest growing areas in science. They have the ability to perceive information, adapt it and reproduce it "assimilated". Neural networks are of many different types, each of which has its own advantages and disadvantages. They are mainly used for clustering, recognition and subsequently for prediction of individual values. All this makes not only the topic, but also the dissertation itself particularly relevant.

I will not dwell on a more detailed description of the dissertation work, but I will outline its essential features.

In my opinion, the dissertation is very well structured. There are theoretical descriptions that are very well argued and supported by literary sources. At times the description is set from different points of view.

The doctoral student has submitted 4 publications related to his dissertation, of which the last [4] is in print. All others [1], [2] and [3] are in publications referenced in scopus. Article [1] has an impact factor and the other three have an SJR factor.

Impressive is the fact that all 4 publications are co-authored with two professors who supervised his dissertation work.

According to the reference in scopus, the doctoral student has 5 citations.

The abstract correctly reflects the results obtained in the dissertation work.

In the dissertation there are tasks that I accept, but there are no contributions described in the text. Instead, there are similar answers to the tasks posted.

Conclusion

In conclusion, I can say that the topic and the dissertation work are relevant and that original results have been obtained. The dissertation fulfills the requirements of ZRAS and the Regulations for the terms and conditions for acquiring scientific degrees and holding academic positions at the University "Prof. Dr. Asen Zlatarov" - Burgas, I give my positive opinion and recommend the respected members of the Scientific Jury to vote for awarding Ivan

Dimitrov Torlakov the educational and scientific degree "Doctor" in the doctoral program "Computer Systems and Technologies", professional direction: 5.3. "Communication and computer technology", scientific area 5. Technical sciences

11.02.2023

Prepared the review :

Подпис заличен

Чл.2 от ЗЗЛД

(Prof. Dr. Sotir Sotirov)