

O P I N I O N

On a dissertation work for the acquisition of an educational and scientific degree "doctor"

Author: Eng. Krasimir Georgiev Markov

Topic: "Intelligent methods for research and implementation of hardware solutions"

Field of higher education: 5. "Technical sciences"

Professional direction: 5.3. "Communication and computer technic",

Specialty: "Computer systems, complexes and networks".

Scientific supervisor: Prof. Dr. Sc. Lyubka Atanasova Dukovska

Jury member: Prof. Dr. Dimitar Karastoyanov

Reason: Order No. 328-1/06.12.2023 of the Director of IIKT-BAS

1. General characteristics of the dissertation work

The dissertation has a volume of 133 pages consisting of an Introduction, 3 Chapters, a Conclusion, Appendices, and a Bibliography of 108 sources. The list of publications on the topic of the dissertation consists of 6 publications.

2. Relevance of the problem developed in the dissertation in a scientific and scientific-applied sense.

The dissertation is dedicated to the design and development of technical means in distributed systems for wireless data collection, transmission, and management. Communication systems of this type are distinguished by:

- use of new communication technologies,
- use of intelligent methods and artificial intelligence,
- efficient information processing,
- high-speed data exchange,
- expanding the scope of the system.

The development and practical application of new technological solutions make the dissertation work relevant and useful.

3. Degree of knowledge of the state of the problem and creative interpretation of the literary material

In Chapter 1 of the dissertation, a literature review and in-depth analysis of methods for radio frequency identification of objects and wireless data communication in distributed systems is made. Chapter 2 explores and analyzes the possibilities for integrating intelligent methods and using artificial neural networks. In Chapter 3, Experimental results of the application of intelligent methods for research and implementation of hardware solutions are presented. A summary of the obtained results is given in the Conclusion.

4. Correspondence of the chosen research methodology and the set goal with the achieved results

The dissertation aims to research and implement hardware solutions using modern methods from the field of intelligent systems.

To achieve this goal, the following tasks have been formulated:

1. To carry out a critical analysis of the possibility of applying intelligent methods for research and implementation of hardware solutions and to analyze the possible connections and interactions between two technologies - radio frequency identification and neural networks.

2. To explore the ways of integrating these technologies to achieve intelligent and efficient solutions for the collection, processing, and management of information flows and to analyze the possibilities for the implementation of radio frequency identification and neural networks in distributed systems.
3. After analysis and synthesis, present original hardware solutions for collecting, processing, and managing information flows.

The requested results show that the doctoral student has successfully used the chosen research apparatus to achieve the goals of the dissertation and obtain new results of a scientific, applied, and practical nature.

5. Scientific and/or scientific-applied contributions of the dissertation work

I accept the contributions of the dissertation work, which are scientific-applied and can be grouped as follows:

1. A critical analysis of the possibility of applying intelligent methods for the analysis and implementation of hardware solutions has been carried out, and of the possible connections and interactions between two technologies - radio frequency identification and neural networks.
2. Ways to integrate these technologies have been investigated and the possibilities for the implementation of radio frequency identification and neural networks in distributed systems have been analyzed.
3. After analysis presents original hardware solutions for collecting, processing, and managing information flows.

6. Evaluation of the publications and personal contribution of the doctoral student

6 publications on the dissertation are presented, of which five are independent. The publications are in English. With the publications made, the results of the dissertation have become available to the scientific community on the subject.

7. Opinion, recommendations and remarks

I have no substantive critical comments on the dissertation and the presented results.

The use of the results in the National Scientific Program "Intelligent Plant Breeding" makes a good impression, Dog. No. D01-65/19.03.2021

Some stylistic and spelling errors do not detract from the contributions of the dissertation.

CONCLUSION

My assessment of the work and the obtained results in the dissertation is positive. All the requirements of the Law on the development of the academic staff in the Republic of Bulgaria, the Regulations for its implementation, as well as the specific conditions for acquiring scientific degrees at the Institute of Information and Communication Technologies, have been met. Based on this, I propose to the esteemed Scientific Jury to award to Eng. Krasimir Georgiev Markov the educational and scientific degree "doctor" in the field of higher education: 5. "Technical sciences", professional direction 5.3. "Communication and computer technic", Specialty "Computer systems, complexes and networks".

Sofia,
9/02/2024

Prepared the

