

# О P I N I O N

by **Acad. Kiril Lyubenov Boyanov, DSc**  
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about a thesis for awarding the educational and scientific degree “**Doctor of Philosophy**”  
in the Scientific field **5. Technical Sciences**,  
Professional area **5.3 Communications and Computer Engineering**,  
Scientific PhD specialty “**Computer Systems, Complexes, and Networks**”

PhD Thesis author: **Dipl. Eng. Edita Ananieva Djambazova**

PhD Thesis title: **Study of the Dependability Characteristics of a Fault-Tolerant  
Distributed Real-Time System with Adjustable Reliability**

Following the order №191 from 20.07.2023 of the Director of the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences, I have been appointed as a member of the Scientific Jury of the PhD Thesis defense of **Dipl. Eng. Edita Ananieva Djambazova** for the awarding of the educational and scientific degree “**Doctor of Philosophy**” (PhD). A scientific consultant of the PhD Thesis is Assoc. Prof. Rumen Andreev, PhD.

As a member of the Scientific Jury, I have been given the following documents:

1. The PhD Thesis for the acquisition of the educational and scientific degree “**Doctor of Philosophy**”.
2. The PhD Thesis abstract.

3. Copies of the publications included in the PhD Thesis.

4. Accompanying documents of the procedure for the defense of the PhD Thesis.

The survey of the above documents demonstrates that they completely conform to the requirements of the Development of the Academic Staff Act in the Republic of Bulgaria, the Regulation for its enforcement, and the Regulation for the conditions and the rules of acquisition of scientific degrees and holding academic positions in the IICT-BAS. All requirements of §3 of the Regulation for the specific conditions for the acquisition of scientific degrees and holding academic positions in the IICT-BAS are fulfilled.

The thesis demonstrates that the candidate has thorough theoretical knowledge about the respective specialty and capabilities for independent scientific research. Concerning the minimal credits in the Professional area 5.3 Communications and Computer Engineering, for awarding the educational and scientific degree “Doctor of Philosophy”, in the group of indicators A, the PhD student has the required number of 50 points and in the group of indicators G, the required points are 30 while the PhD student has 100 points.

The PhD Thesis contains 134 pages. Its structure includes an introduction, four chapters, a conclusion, a declaration of originality, a bibliography, and two appendices.

The goal of the PhD Thesis is to study the dependability characteristics of a fault-tolerant distributed real-time system with adjustable reliability proposed by the author by comparing them to the known similar systems and based on them to develop an approach (of adjustable reliability) to be used in dependable Real-time systems.

Several basic tasks are formulated in the PhD Thesis:

1. To carry out research, a survey, and a critical analysis and to synthesize a classification of the existing dependable distributed systems.

2. To propose a model and an architecture of a fault-tolerant distributed system with adjustable reliability corresponding to the requirements for high reliability.

3. To define a method for the study of the proposed model by the development of a tool realizing the method.

4. To design and carry out experiments for testing and analysis of the dependability characteristics of the proposed fault-tolerant system with reliability adjustment using the selected research approach and the realized software product.

The subject of the PhD Thesis is very topical, especially for a broad area of computer systems operating in Real-time. The increase of fault tolerance can be applied by hardware and software means and in the thesis basically hardware means are used. A clear contribution of the PhD student is the proposed model of a fault-tolerant distributed system with reliability adjustment, as well as the obtained results from the conducted simulation modeling.

The formulated tasks reflect the topicality and the significance of the presented dissertation and the possible implementation of the obtained results in the engineering practice.

In the presented list of publications regarding the PhD Thesis, five publications are included. One publication is in a journal, indicated as “accepted for publication” in the presented list, but it should be noted that it is already published in a journal with open access. Four of the publications are in proceedings of national and international conferences, one of which is indexed in Scopus. This shows that the research has received the necessary publicity.

The PhD Thesis abstract contains 49 pages. It correctly reflects the structure and contents of the PhD Thesis, as well as the main scientific and scientific and implementation results obtained in the PhD Thesis.

Some editorial remarks on the work and recommendations for the future research of the author can be made which do not decrease the significance of the results obtained.

## Conclusion

My opinion is that the requirements of the Development of the Academic Staff Act in the Republic of Bulgaria, the Regulation for its enforcement, and the Regulation for the conditions and the rules of acquisition of scientific degrees and holding academic positions in the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences are fulfilled.

I firmly recommend to the respected Scientific Jury to award the educational and scientific degree “Doctor of Philosophy” (PhD) to Dipl. Eng. Edita Ananieva Djambazova, in the Professional area 5.3 Communication and Computer Engineering, and Scientific PhD specialty “Computer Systems, Complexes, and Networks”.

07.09.2023

Sofia

Signature:

НА ОСНОВАНИЕ  
331Д

/Acad. Kiril Boyanov/