

OPINION

from Assoc. Prof. Metodi Georgiev Traykov, PhD

Department of Informatics, New Bulgarian University,

for obtaining the educational and scientific degree "Doctor of Philosophy",

professional field 5.3. Communication and computer technology

with candidate Genka Ivanova Slavova-Torres

By order № 179/01.07.2026 r. of the Director of the Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (IICT-BAS), I was appointed a member of the scientific jury for the defense of Genka Ivanova Slavova-Torres, a doctoral candidate in the field of higher education 5. *Technical Sciences*, professional field 5.3. Communication and computer technology. The dissertation topic is “Methods and approaches for optimizing write operations in storage area networks”.

As a member of the scientific jury, I have received all required documents (in digital form) that concern the procedure for the defense of the dissertation work of Genka Ivanova Slavova-Torres (a full-time PhD student at Institute of Information and Communication Technologies – Bulgarian Academy of Sciences, IICT-BAS), according to the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria (DASRBA), the Regulations on the implementation of the DASRBA, and the procedure for acquiring scientific degrees and holding academic positions at the Bulgarian Academy of Sciences (BAS). Genka Ivanova Slavova-Torres is deducted with the right to defend by order of the Director of IICT-BAS № 331/22.12.2025 r.

Genka Ivanova Slavova-Torres's main research interests are computer networks and, more specifically, modern network environments for data storage.

The dissertation titled "Methods and approaches for optimizing write operations in storage area networks", developed by Genka Ivanova Slavova-Torres, presents, in a complete form, the results of in-depth research in the area of network environments for data storage (Storage Area Networks – SAN). The dissertation consists of 6 chapters, a conclusion, a list of scientific contributions, a bibliography, and appendices, totaling 147 pages. The dissertation includes 24 figures, 16 tables, and 1 appendix. References include 61 sources in English.

The introduction describes the aims and objectives, relevance, and applicability of the technological framework presented in the dissertation.

1. Significance of the researched problem in scientific and scientific-applied terms.

The dissertation work under consideration on the topic "Methods and approaches for optimizing write operations in storage area networks", hereinafter referred to as "thesis" in the Opinion, is dedicated to creating a tool for precise and timely assessment of Storage Area Network

is clearly formulated and justified: to develop and validate a system model of write operation behavior in a SAN environment that accounts for interactions among the layers of the write path, enables identification of the factors determining final latency, and supports the formulation of principles and guidelines for optimizing write operations under different load modes.

To achieve this goal, Genka has set himself several tasks:

- To analyze the architectural characteristics of modern SAN environments and the factors influencing the behavior of write operations;
- To develop a conceptual system-level model of the write path, describing the write process as an interaction among the host system, the transport layer, I/O queues, and the storage subsystem;
- To develop an analytical model for interpreting latency behavior;
- To define appropriate metrics for latency analysis;
- To design an experimental methodology for the controlled investigation of write operations under different workload conditions;
- To develop a framework for optimizing write operations in SAN environments based on analyses of the results.

The tasks set by Genka go beyond the usual work of standard research; they are necessary to achieve the goal and serious enough for the thesis topic.

3. Correspondence between the chosen methodology and the research methodology and the aim and tasks of the dissertation work.

To prepare for implementing the tasks set in the thesis, the PhD student conducted thorough research on publications related to the topic. The bibliographic references include 61 titles. My review shows that all the titles I checked are properly cited in the thesis text. Not only that, but the content of each cited work has been evaluated for the adequacy of using the relevant results to meet the aim and the formulated tasks. This shows that the PhD student is very well acquainted with modern scientific achievements in the field of the thesis and has carefully selected the most suitable approaches for her research. This detailed analysis of the sources will be invaluable to any researcher undertaking further work on the subject.

4. Scientific and scientific-applied contributions of the dissertation work.

I accept the PhD student's claims of scientific contributions presented by the PhD student as admissible and leave them for detailed assessment by the reviewers.

5. Evaluation of the publications of the dissertation work: number, nature of the editions in which they were published.

The thesis results were published in 6 articles (4 self-contained and 2 co-authored with the

scientific supervisor). Four of the publications are in English (the self-contained publications), and two are in Bulgarian. Five publications appear in international conference proceedings (2025 International Conference Automatics and Informatics (ICAI), 33rd National Conference with International Participation "Telecom 2025", International Conference RAM 2022, 2023), and one appears in an international scientific journal (International Scientific Journal Security & Future). Publications [1, 2] (according to the numbering in the list of publications in the dissertation, in the abstract) are indexed in Scopus. If we accept the dissertation abstract as a type of publication, it accurately reflects the obtained results.

6. Citations by other authors, reviews in the scientific press, etc.

I am not aware of citations of the PhD student's work by other authors or of reviews in the scientific press. The presented materials give me reason to accept the obtained results as reliable.

7. Opinions, recommendations, and notes.

I have no critical notes regarding the results and evidence. Overall, the text is well-structured and richly illustrated with relevant images, graphics, and schemes. I recommend that the doctoral student continue her publication activity in indexed scientific journals, following the requirements in professional field 5.3 "Communication and computer technology".

Abstract of dissertation

The dissertation abstract consists of 35 pages. It was prepared in accordance with the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria (DASRBA) and the Regulations on the implementation of the DASRBA. Its content accurately and comprehensively reflects the thesis's results and contributions.

Conclusion:

The dissertation work presented by Genka Ivanova Slavova-Torres contains theoretical and practical results that constitute an original contribution to the scientific field under consideration and meet all the requirements of the DASRBA and the Regulations for the implementation of the DASRBA. The doctoral student possesses in-depth theoretical and practical knowledge and professional skills in her scientific field and demonstrates qualities and skills for independent scientific research. My evaluation of Genka Ivanova Slavova-Torres's dissertation work, dissertation abstract, scientific publications, and scientific contributions is **POSITIVE**.

The achieved results justify proposing the awarding of the educational and scientific degree "Doctor of Philosophy" to Genka Ivanova Slavova-Torres in the field of higher education 5. "Technical Sciences", professional field 5.3. "Communication and computer technology".