

OPINION

by Assoc. Prof. Katia Rasheva-Yordanova, PhD

University of Library Studies and Information Technologies

Regarding the dissertation of **GERGANA PETKOVA MATEEVA**
on the topic
**"MODELING AND OPTIMIZATION OF COMMUNICATION
STRATEGIES IN INFORMATION PROCESS MANAGEMENT"**

The present opinion has been prepared in accordance with Order No. 265 of 31.10.2025 issued by the Director of IICT-BAS, based on a decision of the Scientific Council of IICT (Protocol No. 8 of 29.10.2025), by which I was appointed as a member of the scientific jury for conducting the procedure for the defense of the dissertation titled **"MODELING AND OPTIMIZATION OF COMMUNICATION STRATEGIES IN INFORMATION PROCESS MANAGEMENT"** for awarding the educational and scientific degree **"Doctor"** in the doctoral program **"Informatics"**, professional field **4.6. "Informatics and Computer Science"**, submitted by **GERGANA PETKOVA MATEEVA**, under the supervision of **Prof. Tatiana Atanasova, PhD**.

I. General Description

The dissertation consists of 135 pages. Its structure includes an Introduction, three chapters, a Conclusion summarizing the obtained results, a list of publications related to the dissertation, a list of identified citations of these publications, a declaration of originality of the results, and a bibliography. The dissertation contains 48 figures, 9 tables, and 137 bibliographic sources. The attached list of publications includes 7 titles.

II. Relevance and Significance

The dissertation of Gergana Mateeva is dedicated to the development of models and methods for optimizing communication strategies in the management of information processes. The topic is highly relevant in the context of accelerated digital transformation and the dynamic development of

information and communication technologies (ICT), which directly influence the efficiency of organizational management.

Given the increasing complexity of information processes—encompassing the integration of IoT, cloud solutions, mobile technologies, and artificial intelligence—there is a growing need for new hybrid models that adapt communication strategies to limited resources and distributed environments. The dissertation addresses precisely this need. It proposes original optimization approaches, including a DNA-inspired modification of genetic algorithms and adaptive approximation of objective functions.

The relevance of the research stems from the importance of communication as a key competence for effective management of information processes. The developed methods and models can support managerial decision-making in a dynamic and often unpredictable digital environment.

III. Knowledge of the Research Problem

The conducted literature review, as well as the published results related to the dissertation topic, demonstrate that the doctoral candidate has a solid understanding of the nature of the researched problem. Additional evidence of this is the bibliography, which contains 137 cited sources.

IV. Analysis of the Candidate's Scientific Achievements

In evaluating the dissertation, the requirements of the Act for the Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and its implementing regulations are decisive. According to Art. 6 (3) of ADASRB, the dissertation must contain scientific or applied scientific results that represent an original contribution to science.

Based on the submitted declaration of originality, as well as on the publications related to the dissertation topic, it can be determined that the reported results are the author's own work.

The doctoral candidate has seven publications directly related to the dissertation topic, published in peer-reviewed scientific journals and presented at international scientific forums. One of these publications appears in a Q4-ranked journal, which demonstrates the visibility and academic quality of the

research. In six of the presented publications, the doctoral candidate is the first author.

The dissertation also reports citations identified in internationally indexed publications (Scopus, IEEE Xplore), which confirm the scientific significance and impact of the results. The independent citations in global scientometric databases demonstrate the required visibility and international recognition of the achieved contributions.

The contributions formulated in the dissertation can be classified as scientific and applied-scientific and can be summarized in three main directions:

- **Methodological improvement** – through the development of new approaches for enhancing the efficiency of genetic algorithms in networked environments, including a DNA-inspired modification and adaptive approximation of objective functions under resource constraints;
- **Architectural innovation** – through the creation of a flexible model for managing information flows and modeling communication strategies for distributed mobile and IoT environments;
- **Practical application** – through the validation of the proposed framework in a real cyber-physical system for smart agriculture, demonstrating its applicability and effectiveness.

These achievements align with the objectives set in the dissertation and demonstrate an original contribution to science by enriching the theoretical framework and providing practical solutions applicable to real communication and information processes

V. Abstract

The submitted abstract accurately reflects the contents of the dissertation and complies with the requirements of the ADASRB and its implementing regulations. It consists of 45 pages in Bulgarian and 48 pages in English.

VI. Critical Notes

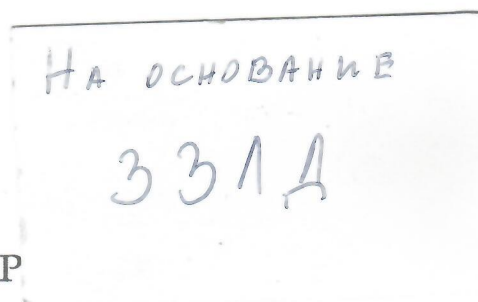
I have no substantial critical remarks. I noticed some stylistic inaccuracies and spelling errors in the dissertation, which do not diminish the significance of the achieved results.

VII. Conclusion

I consider that the requirements of the ADASRB, its implementing regulations, and the Rules for the Specific Conditions for Acquiring Scientific Degrees and Holding Academic Positions at IICT-BAS have been fulfilled. After reviewing the dissertation and its accompanying publications, and analyzing their significance and the contributions they contain, I confidently give my positive evaluation and recommend that the esteemed scientific jury award the educational and scientific degree "Doctor" to GERGANA PETKOVA MATEEVA in the professional field 4.6. "Informatics and Computer Science," doctoral program "Informatics."

Sofia

/Assoc. P



ra, PhD /