

OPINION

by **Associate Professor Leoneed M. Kirilov, PhD**

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on the Thesis for awarding educational and scientific degree “Doctor of Philosophy” (PhD), under the Scientific field: 4. Natural Sciences, Mathematics and Informatics; the Professional area: 4.6. Informatics and Computer Sciences, the Doctoral program: Informatics

Author of the PhD Thesis: Georgi Evtimov Evtimov

PhD thesis title: Metaheuristic methods for reducing cutting tasks

According to the Order No. 252 from October 28, 2021 of the Director of the Institute of Information and Communication technologies – Bulgarian Academy of Sciences, I have been appointed as a member of the Scientific Jury regarding the PhD thesis of Georgi Evtimov Evtimov for awarding educational and scientific degree “Doctor of Philosophy” (PhD) in the Scientific field: 4. Natural Sciences, Mathematics and Informatics; the Professional area: 4.6. Informatics and Computer Sciences, the Doctoral program: Informatics.

At the first meeting of the Scientific Jury on November 9, 2021, it was decided that I would write an opinion on the dissertation.

As a member of the Scientific Jury I have received:

1. Text of the Thesis for awarding educational and scientific degree “Doctor of Philosophy”;
2. Abstract of the Thesis both in Bulgarian and English;
3. Full text of the articles attached to the dissertation as an integral part of it in accordance with the requirements of ZRASRB and the Regulations for its implementation - eight articles;
4. A reference for Georgi Evtimov Evtimov on fulfillment of the minimum requirements of the Institute of Information and Communication Technologies - BAS for awarding the educational and scientific degree "Doctor".
5. Order No. 345 from December 30, 2019 issued by IICT – BAS for withdrawing Georgi Evtimov Evtimov from part-time doctoral studies with right up for grant PhD degree when the Thesis is ready within a legal deadline.
6. Order No. 252 from October 28, 2021 issued by IICT – BAS for designation of Scientific Jury;

Scientific advisor of the PhD student is Prof. Stefka Fidanova.

The dissertation is written on 143 pages and it consists of 5 chapters: introductory chapter, three chapters where the scientific results are presented, final chapter, summary of contributions, list of publications attached to the dissertation, approbation of the results, declaration of originality, acknowledgments. The text is illustrated with 142 figures and 39 tables.

The objectives of the dissertation are formulated as follows:

- to find optimal cutting of one-dimensional elements with minimal material losses as a criterion;
- to find optimal cutting of two-dimensional elements with irregular shape according to the same criterion.

To achieve the goals, the following tasks are formulated:

1. Development of an algorithm for solving the problem of one-dimensional cutting;
2. Development of an algorithm for solving the problem of two-dimensional cutting of irregularly shaped elements;
3. Implementation of the proposed algorithms and their comparison with other existing methods for cutting on real construction tasks.

I consider that the so formulated goals and objectives accurately reflect the main ideas realized in the dissertation. The relevance and significance of the results obtained are well presented in the main text.

The contributions of the dissertation are both scientific: created algorithms for one-dimensional and two-dimensional cutting and research of their advantages over other approaches, and scientific-applied: creation of a software system in which the developed cutting algorithms are implemented. This system is already used successfully in construction practice.

A number of eight co-authored publications are attached to the dissertation, which reflect some of the scientific results. Five of them have been published in international publications with an impact rank. It can be concluded that the results obtained are recognized in scientific circles.

The abstract has a volume of 64 pages. I consider that it accurately reflects the content of the dissertation.

Conclusion

I accept that the requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its implementation, the Regulations on the terms and conditions for obtaining scientific degrees and holding academic positions at BAS and the Regulations on specific conditions for acquisition

of scientific degrees and for holding academic positions at the Institute of Information and Communication Technologies – BAS are met.

I give a positive assessment for the acquisition of the educational and scientific degree "Doctor" of Georgi Evtimov Evtimov.

I recommend to the esteemed Scientific Jury members to award the educational and scientific degree "Doctor" of Georgi Evtimov Evtimov in the scientific field: 4. Natural Sciences, Mathematics and Informatics, Professional field: 4.6 Informatics and Computer Science, doctoral program: Informatics.

January 5, 2022

Sofia



/Assoc. Prof. Leoneed M. Kirilov/