

ATTITUDE

on dissertation work for the acquisition of educational and scientific degree "doctor"
in a professional field: 4.6 Informatics and Computer Science

Author of the thesis: Georgi Evtimov Evtomov

Thesis title:

METAHEURISTICS METHODS FOR REDUCING CUTTING TASKS

Member of the Scientific Jury:

Assoc. Prof. PhD Desislava Ivanova

Technical University of Sofia

1. Relevance of the problem

The presented dissertation consists of 4 chapters, contributions, list of publications, approbation of the results, declaration of originality and bibliography. The dissertation has a total volume of 143 pages, 39 tables, 143 figures, 10 algorithms and 117 cited references. The main goal of the dissertation is optimal cutting of linear elements and two-dimensional elements with irregular shape with minimal waste. ***The scientific field is undoubtedly relevant and finds applications in various industrial applications.***

2. Degree of knowledge of the status of the problem and responsibility of the chosen research methodology and set goals and objectives

The first chapter reviews current research topics in the field of metaheuristic methods for solving cutting problems. The need to develop new algorithms and software for optimal cutting is motivated. ***The second chapter*** presents the basic definitions in computational geometry. ***In the third chapter*** a problem for one-dimensional (1D) cutting is formulated and solved. ***In the fourth chapter*** the problem of 2D cutting, finding a possible solution and the final solution with all the plates is formulated. In conclusion, a summary of the experimental results is presented.

Conclusion: Georgi Evtimov Evtimov shows a high level of knowledge in the scientific field, as the goals and tasks set in the dissertation fully correspond to the chosen research methodology.

3. Contributions

The contributions in the dissertation can be divided into scientific and applied:

SCIENTIFIC:

1. An algorithm for optimal cutting in one-dimensional space has been developed.
2. An algorithm for optimal cutting in two-dimensional space has been developed.
3. A method for two-dimensional cutting based on hybrid optimization has been developed.

APPLIED:

4. A software implementation of the algorithm for one-dimensional cutting has been made.
5. A software implementation of the two-dimensional cutting algorithm has been made.

4. Dissertation publications

Georgi Evtimov Evtimov has presented 7 publications related to the dissertation. All publications are presented at renowned scientific forums. Four of the publications are indexed in the global scientific database “Scopus”. In addition, citations of the dissertation's publications related to the dissertation have been noted. *The publications presented by Georgi Evtimov Evtimov fully cover the requirements for obtaining the educational and scientific degree „doctor“ in the professional field 4.6 Informatics and Computer Science.*

5. Opinion and recommendations

The dissertation is written at a high level. The abstract contains the basic information and accurately and clearly reflects the contributions to the dissertation.

Questions:

- ✓ In your opinion, what would be the challenges in parallelizing the proposed software solution for graphics accelerators? What would be the potential benefits?

6. Conclusion

The presented dissertation corresponds to the set of criteria and indicators for acquiring the educational and scientific degree "Doctor", according to the Law for development of the academic staff in the Republic of Bulgaria (ZRASRB), the Rules of BAS for scientific degrees and for holding academic positions at IICT-BAS.

I strongly recommend to the scientific jury to award Georgi Evtimov Evtimov the educational and scientific degree "Doctor" in the professional field 4.6 Informatics and Computer Science.

Date: 28.01.2022
Sofia, Bulgaria



Assoc. Prof. PhD Desislava Ivanova