

I. IDENTIFICATION DATA

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| Thesis name: | Analysis and investigation of the convergence of the Bezout coefficients search algorithm |
| Author's name: | Zhumaniezov Alisher |
| Type of thesis : | master |
| Faculty/Institute: | Faculty of Electrical Engineering (FEE) |
| Department: | Department of Computer Science |
| Thesis reviewer: | Kugurakov Vladimir Sergeevich |
| Reviewer's department: | Kazan Federal University, Institute of Computer Mathematics and Information Technologies, Department of Theoretical Cybernetics |

II. EVALUATION OF INDIVIDUAL CRITERIA

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| Assignment | challenging |
| <i>Evaluation of thesis difficulty of assignment.</i> | |
| In the master's thesis of Zhumaniezov A.R., the problem of optimizing the Bezout coefficients search algorithm is considered. The main idea of developing algorithms was to change the approach to choosing the next iteration. The main purpose of the thesis was to develop such algorithms and test their effectiveness in practice. | |
| Satisfaction of assignment | fulfilled |
| <i>Assess that handed thesis meets assignment. Present points of assignment that fell short or were extended. Try to assess importance, impact or cause of each shortcoming.</i> | |
| In the introduction, the author determines the object of the study, justifies the relevance of his work and gives the main provisions made for defense. In the first chapter, a brief review of the literature is given, a description of the basic algorithms considered in the paper and known schemes for optimizing the Euclidean algorithm, is given. For each algorithm presented, convergence estimates are derived and examples of work are shown. In the second chapter deep analyses of tasks and issues was provided. In the second chapter, a deep analysis of tasks and questions was presented. Also, various versions of the extended Euclidean algorithm were described, with included optimization schemes. For each algorithm presented, convergence estimates are derived and examples of work are shown. The last chapter gives a brief description of the structure of the program. Also, charts for visual comparison of the implementations are presented and conclusions about their work are drawn. The work as a whole is performed at a high level. Work is generally performed at a high level, but there are a number of remarks. As an estimate of convergence, the number of steps is presented, and what about the total time complexity? | |
| Method of conception | correct |
| <i>Assess that student has chosen correct approach or solution methods.</i> | |
| All the existing approaches to the solution have been studied. Each one is accompanied by a description of the algorithm, analysis of convergence and examples. For the implementation time performance are presented and conclusions are drawn about their effect on acceleration, advantages and drawbacks. | |
| Technical level | A - excellent. |
| <i>Assess level of thesis specialty, use of knowledge gained by study and by expert literature, use of sources and data gained by experience.</i> | |
| The task is hard and requires a lot of knowledge from number theory. | |
| Formal and language level, scope of thesis | A - excellent. |
| <i>Assess correctness of usage of formal notation. Assess typographical and language arrangement of thesis.</i> | |
| The text is well structured and quite well organized. The language level is above normal. Text of diploma thesis contains graphs for visual representation of results and examples for visual representation of algorithm work. | |

Selection of sources, citation correctness

B - very good.

Present your opinion to student's activity when obtaining and using study materials for thesis creation. Characterize selection of sources. Assess that student used all relevant sources. Verify that all used elements are correctly distinguished from own results and thoughts. Assess that citation ethics has not been breached and that all bibliographic citations are complete and in accordance with citation convention and standards.

The work contains various sources that cover the topic. The content shows that the author has studied in detail all the sources cited. Sources published recently show the significance of master's thesis today, although not all sources published recently.

Additional commentary and evaluation

Present your opinion to achieved primary goals of thesis, e.g. level of theoretical results, level and functionality of technical or software conception, publication performance, experimental dexterity etc.

Difficult and ambitious task was set. Judging by the results, it was completely solved and deserves an excellent evaluation. All the algorithms considered are detailed and based on the results obtained, the relevant conclusions are drawn. Considering these facts, the value of this work is excellent.

III. OVERALL EVALUATION, QUESTIONS FOR DEFENSE, CLASSIFICATION SUGGESTION

Questions for defense:

- *As an estimate of convergence, the number of steps is presented, and what about the total time complexity?*

I evaluate handed thesis with classification grade **A - excellent**.

Date: **4.6.2018**

Signature: