

STATEMENT

from **assoc. prof. dr. Velizar Shalamanov**,
Institute of Information and Communication technologies – BAS,
for dissertation work for gaining educational and scientific degree “**doctor**” over
program: „Automated systems for information processing and management“,
professional division: 5.2. Electrical engineering, Electronic and Automation”,
educational area: 5. „Technical sciences”

Author of the dissertation: **Stefan Borisov Karastanev**
Dissertation title: “**Reengineering of industrial robots**”

With order № 233.30.9.2019 of the director of ICT-BAS, Sofia I am chosen to be a member of the scientific jury of the doctorant **Stefan Borisov Karastanev** for gaining educational and scientific title “doctor”. Supervisor of the dissertation work is **prof. d-r Dimitar Karastoyanov**. The PhD is a freelance student at ICT-BAS, Sofia.

For formulation the overall dissertation evaluation, the requirements of ЗРАСРБ and the manual of its application (ППЗ), as the main forms are:

1. According to art. 6 (3) from ЗРАСРБ „**the dissertation should include scientific or scientifically-applied results, that has original contribution to science. The dissertation must show , that the candidate has deep theoretical knowledge in the corresponding field and abilities for self scientific research**”
2. According to art. 27 (2) of ППЗ the dissertation has to be presented in form and volume according to the specific requirements of the primary unit. **Dissertation must include: main page, table of contents, introduction, prospect, conclusion – summary of the accomplished results and Originality declaration; references.**

I. Overall characteristics of the dissertation

The dissertation has 258 pages, structured in six chapters, contributions, list with publications, references with 87 sources, author’s publications over the dissertation (7 in total).

Introduction that represents the actuality, the matter, subject and the importance of the research and the used methodology is missing.

Each chapter is part of the work done and has its summary and conclusions over the gained results. The connection between the chapters is provided by the logic of the prospect and allows the gaining of overall insight of the scientific presentation.

The goal of the dissertation is defined on page 43 in chapter 1 (section 1.7) в първа глава (раздел 1.7.): „Reengineering of second-hand industrial universal robots (IUR) by renewing the mechanics, rebuilding the electronics and software, test of the robotic systems and embedding of new industrial applications”.

За постигането на поставената цел са дефинирани следните задачи:

1. Overview, analysis and systematization of mechatronic robotic systems;
2. Selection of an IUR type representative for reengineering;
3. Research of mechanics, electronics and software of IUR;
4. Developing of methodology for research of IUR;
5. Developing of concept for whole reengineering of IUR ;
6. Building, testing and verification of the modernized IUR.

I think that the desired goal and the formulated tasks resemble the actuality and the importance of the dissertation, that contains useful results connected with the development of new areas for re-using industrial robots.

In first chapter an overview, analysis and systematisation of the mechatronics robotic systems is made, which proves the actuality and the importance of the subject, the goal and the tasks are formulated.

The second chapter is dedicated on the investigation of the universal industrial robots (UIR) and identification of the main elements of reengineering - mechanics, electronics, programming.

The third chapter represents a methodology for research of UIR by the elements defined in the second chapter. The focus is over reengineering of robot KUKA KR-150, and the different researches are presented with the according conclusions.

Fourth chapter examines the construction of a modernized UIR. Fifth chapter includes the verification of the methodologies for reengineering of UIR.

Sixth chapter presents approach for optimisation and innovation of reengineering of industrial robots, as describe wireless management console, which has a patent application.

Instead of a conclusion the author present list of contributions by the model overview-analysis-modeling-synthesis-testing-verification with theoretical researchers for practical realisation.

Follows references, used in the course of the dissertation with good balance between books and journals, internet sources in Bulgarian, English and Russian language.

In the presented publication list are included 7 publications, incl. approved patent application. The qualities of the presented work are backed by their presence in reputable scientific publications and are included in the collections of specialized scientific conferences.

There isn't data for any quotations.

II.Evaluation of the scientifically-applied and application contributions

I accept the formulated contributions by the candidate, as they have scientifically-applied and application matter. The defined contributions can be defined as enriching the current scientific area with new knowledge.

III. Crucial notes and recommendations:

1. The dissertation content doesn't match the requirements of art 27 (2) from ППЗ. **The dissertation has to start with introduction and to ends with references.**
2. The list of references over the dissertation doesn't keep up with the requirements of full literature description.
3. The doctorant should focus his work over the increasing of his publication activity in popular international journals.

IV.Evaluation of the autoreferat

The autoreferat has 30 pages and resume in English. It corresponds with the essence of the dissertation, the subject, the object and the dissertation tasks and their realization. In structural matter it can be improved with the actuality, the importance and the subject, the research field. the used methodology along with the goal and tasks of the research.

V. Conclusion

Despite the notes, I accept that the requirements of (ЗРАСРБ) and the Manual of its application are kept. After acquaintance with the presented dissertation and its publications, analysis of their importance and their contributions, I give my positive assessment and recommend to the honored jury to award scientific and educational title "doctor" to Stefan Borisov karastanevda присъди образователната и научна степен „доктор” на г-н Стефан Борисов Карастанев in Professional division: 5.2. „Electrical engineering, Electronic and Automation“, Scientific discipline: „Automated systems for information processing and management“, Educational area 5. "Technical sciences"

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14.10.2019 Sofia

Jury member: assoc. prof. Velizar Shalamanov