

OPINION

by Assoc. Prof. Dr. Eng. Vladimira Krasteva Ganchovska

Member of the Department of Computer Systems and Technologies at the University of Food Technology - Plovdiv

of a dissertation for the award of educational and scientific doctorate degree

in: field of higher education 5. Technical sciences

professional field 5.3 Communication and computer technology

Doctoral program Automation of areas of the intangible sphere (medicine, education, science, administrative activities, etc.)

Author: *M. Eng. Anatoliy Rosenov Parushev*

Topic: *AUTOMATION OF A LABORATORY FOR ECO-ENERGY TECHNOLOGIES.*

Scientific supervisor: *Prof. Dr. Eng. Rumen Kostadinov Popov.*

1. General presentation of the procedure and the doctoral student

The set of materials on paper presented by Anatoliy Rosenov Parushev is in accordance with Art. 36 (1) of the Regulations for the Development of the Academic Staff of the University of Plovdiv and includes the following documents:

- a request to the Rector of the University of Plovdiv to disclose the procedure for defending a dissertation;
- CV in European format;
- minutes from the department council, related to reporting the readiness to open the procedure and preliminary discussion of the dissertation work;
- dissertation;
- abstract;
- a list of scientific publications on the topic of the dissertation;
- copies of scientific publications;
- declaration of originality and authenticity of the attached documents;
- a certificate of compliance with the specific requirements of the respective faculty.

M. Eng. Anatoliy Rosenov Parushev was born on 31.08.1997. In 2020, he obtained the "bachelor's" qualification in the specialty "Computer and Communication Systems" at Plovdiv University "Paisii Hilendarski". In 2021, he obtained the "master's" qualification in the specialty "Information Security" at the same university. On 01.03.2021, the candidate was enrolled as a full-time doctoral student at the Department of "ELECTRONICS, COMMUNICATIONS AND INFORMATION TECHNOLOGIES" of Plovdiv University "Paisii Hilendarski", and from 01.03.2025 he was discharged with the right to defend by order No. RD-22-598 of 28.02.2025.

2. Relevance of the topic

The doctoral student's dissertation examines the topic of implementing modern, automated and remotely accessible laboratory solutions to support the transition to green energy and modern education in the context of rapid digitalization. Such solutions support the modernization of education, especially in hybrid and distance learning environments, by ensuring equal access to real equipment.

3. Knowing the problem

The overview part of the dissertation is 50 pages long. It includes 107 literary and 32 electronic sources, most of which are from the last 10 years. This shows the thorough preparation of the doctoral student on the topic and contemporary trends in solving the tasks of the dissertation.

4. Research methodology

I believe that the approaches chosen by the doctoral student for the development and construction of an automated laboratory stand with remote control capabilities, intended for the training and research of thermal processes, meet the defined tasks and the set goal.

5. Characterization and evaluation of the dissertation work and contributions

The dissertation has a volume of 224 pages. It is organized into an introduction; five chapters; a list of the author's publications related to the dissertation; bibliography and Appendices. The first chapter provides a literature review of laboratory automation tools in the field of eco-energy technologies. The second chapter examines the features, measurement methodologies and approaches to modernization of the SR1162E stand. An analysis of its functionalities is made and specific steps for its optimization and improvement are proposed. The development and implementation of the automated stand with remote access are described in the third chapter of the dissertation. The fourth chapter examines the validation of the developed automated laboratory system and its applicability. The fifth chapter draws conclusions and contributions to the dissertation. The doctoral student has defined 8 contributions, 3 of which are defined as scientific and applied, and the rest as applied. I believe that the defined contributions reflect the results achieved and are directly related to the set goals and objectives.

6. Assessment of the doctoral student's publications and personal contribution

The doctoral candidate has attached 6 publications in English to the dissertation, in three of which he is the first author. The publications correspond to the topic of the dissertation and reflect the results obtained. The scientometric indicators related to the submitted publications meet the minimum national requirements for acquiring the Educational and Scientific Degree "Doctor".

7. Autor's abstract

The abstract submitted for review is in two versions – one in Bulgarian and one in English. The volume of the abstract is 32 pages and meets all the regulatory requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDACRB), the Regulations for the Implementation of the LDACRB and the relevant Regulations of the University of Paisiy

Hilendarski. The defined goal and objectives, summaries of all chapters of the dissertation, the main experiments and the results obtained are included. The main conclusions for each of the points and the defined contributions are presented. A list of publications related to the dissertation work is also attached.

8. Recommendations for future use of the dissertation contributions and results

I recommend that, in order to increase the accuracy and reproducibility of measurements during remote work, automated data processing algorithms, including filtering and statistical analysis, be developed. In the future, the developed methodologies can be applied in a broader context – for example, in the study of heat exchange processes in other fluids or to expand the experimental base with additional modules – for example, for hygrometric measurements, for air quality analysis or for acoustic studies of air flow.

CONCLUSION

The dissertation work of Anatoliy Rosenov Parushev fully complies with the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of ZRASRB and the relevant Regulations of the PAISIY KHILENDARSKY PU.

Based on the results obtained in the dissertation work, **I give my positive assessment. I propose to the esteemed scientific jury to award the educational and scientific degree "doctor" to Anatoliy Rosenov Parushev** in the field of higher education 5. Technical sciences, professional field 5.3 Communication and computer technology, doctoral program Automation of areas of the intangible sphere (medicine, education, science, administrative activities, etc.).

18.11.2025 г.

Prepared the opinion:

/Assoc. Prof. Vladimira Ganchovska /