

REVIEW

by Eng. Borislav Hristov Milenkov PhD

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of a dissertation for the award of the educational and scientific degree "**doctor**"

by: field of higher education : **5. Technical sciences;**

professional field : **5.2. "Electrical engineering, electronics and automation";**

doctoral program: "**Electronization (by industries and groups of scientific specialties)**";

Author : M.Eng. Angel Hristov Chekichev

Topic: "DISTANCE LABORATORY IN ELECTRONIC MEASUREMENT TECHNIQUES "

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

1. General description of the materials presented

By order No. PD-22-1398 of 16. 07. 2026 of the rector of Plovdiv University "Paisiy Hilendarski" (PU), I have been appointed as a member of the scientific jury for ensuring a procedure for the defense of a dissertation on the topic "**REMOTE LABORATORY IN ELECTRONIC MEASUREMENT TECHNOLOGY**" for the acquisition of the educational and scientific degree "**doctor**" in: field of higher education **5. Technical sciences** , professional field **5. 2. "Electrical Engineering, Electronics and Automation"** , doctoral program "**Electronization (by branches and groups of scientific specialties)**". The author of the dissertation is **M.Eng. Angel Hristov Chekichev** - doctoral student in independent training, at the department "**Electricity and Communications**" , with scientific supervisor **Prof. Dr. Eng. Rumen Kostadinov Popov** from Plovdiv University "Paisiy Hilendarski".

The set of materials on paper presented by **M.Eng. Angel Hristov Chekichev** **is** in accordance with Art. 36. (1) of the Regulations for the Development of the Academic Staff of the University of Sofia, and includes the following documents:

- a request to the rector of the University of Plovdiv to open a procedure for defending a dissertation;
- CV in European format;
- minutes from the department council, related to reporting the readiness to open a procedure and preliminary discussion of a dissertation;

- 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 (only for doctoral students enrolled by 04.05.2018) .

The doctoral student has submitted 6 (six) full-text articles publications, and in the reference – 5 (five). The article "THE ARTIFICIAL INTELLIGENCE AND VIRTUAL LABORATORIES IN THE TRAINING OF STUDENTS IN ENGINEERING EDUCATION" is not in his list.

2. Brief biographical data about the doctoral student

The doctoral student in 2009 acquired the "Professional Bachelor" qualification, after which he obtained the "Master" qualification in three specialties: "Communication Equipment and Technologies" (TU - Varna, 2012), "Physics Education in Secondary School" (PU "P. Hilendarski", 2021) and engineer in "Eco-technological Systems in Industry" (PU "P. Hilendarski", 2024) .

He gained professional experience as a teacher at the Ivan Vazov Elementary School in Smolyan and as a "Computer Analyst, Software Support" at the Department of Electrical Power Engineering and Communications.

Currently, he holds the academic position of "Assistant" in the same department.

3. Relevance of the topic and appropriateness of the set goals and objectives

The past wave of the COVID-19 epidemic has set the task of acquiring practical skills in the training of engineers. The development Information and communication technologies provide an opportunity to solve this task.

On the other hand, access to expensive equipment and stands is often an overwhelming task for Universities. The relevance of the dissertation work stems from the need to improve the quality of education in disciplines with a pronounced practical focus and from the need to ensure equal access to these resources.

The goal set in this dissertation, as well as the tasks for its achievement, are correctly formulated.

4. Knowing the problem

The dissertation begins with an introduction, a list of abbreviations used, five chapters and 7 (seven) appendices.

Chapter one is entitled "Overview of Systems and Tools for Building Virtual Laboratories". It cites 126 literary sources. Of these, 76 are in Latin, 22 in Cyrillic, and 26 sources from the Internet. All reflect problems addressed in the dissertation.

This shows good knowledge of the problem and is a prerequisite for completing the assigned tasks.

Some of the articles in the dissertation, attached by the doctoral student, were used in the literature review, which can be qualified as an auto-citation.

5. Research methodology

The dissertation is 232 pages long, including 142 figures, 6 tables, organized into an introduction, 5 chapters, general conclusions, scientific and applied contributions, a list of symbols and abbreviations used, a list of the author's publications, and seven appendices.

In the first chapter, based on the literature review, an analysis of the basic principles related to remote and virtual learning is made. laboratories, the systems and tools used for their construction, as an innovative tool for modernizing engineering education. Based on this analysis, the goal was formulated: design, implementation and testing of tools and methods for remote conducting of laboratory exercises in the discipline "Electronic Measurement Techniques".

6. Characteristics and evaluation of the dissertation work

The dissertation is well structured methodologically.

After the literature review, in Chapter Two, different types of filters are examined (Active filters, Chebyshev filter , bandpass filter and peak detector). The chapter ends with conclusions and in conclusion, the developed methodology for building a remote laboratory environment, supported by an analytical and practical-applied approach.

Chapter three of the dissertation is the actual design of a remote laboratory, in which the main analog modules discussed in chapter two are modeled and analyzed.

The fourth chapter of the dissertation presents the results of the conducted experimental studies and their validation. The main goal of the studies is to confirm the effectiveness of the proposed methodologies developed in Chapter 2, to verify the functioning of the hardware solutions described in Chapter 3, as well as to analyze the obtained results using the used measuring equipment and the means for process management and control.

Chapter five of the dissertation is dedicated to conclusions and contributions.

7. Contributions and significance of the development for science and practice

The doctoral student has formulated a total of 10 (ten) contributions, divided into scientific and applied.

In my opinion, scientific and applied contribution No. 3 "A formalized approach has been developed for managing and configuring measurement processes in a LabVIEW environment ..." is of an applied nature.

I accept the remaining contributions, from both groups, and believe that they reflect the stated goal of the dissertation, as well as the tasks to achieve it.

8. Assessment of dissertation publications

The publications attached to the documents reflect the results achieved in the development of the dissertation . As of September 9, I have not found any citations to these articles.

Publications can be classified by type :

- Scientific conference reports 4 (four);
- Articles in scientific papers 2 (two).

Four of the articles are in English, and the two published in scientific papers are in Bulgarian, and the doctoral student is an independent author.

In scientific conference reports, the doctoral student is a co-author with his supervisor and team. Here, he is the first author.

9. Personal participation of the doctoral student

I believe that the doctorate independently conducted the experiments described in the dissertation, the formulated contributions and obtained results are his personal merit.

10. Autor's abstract

The abstract is presented in Bulgarian and English, in accordance with the requirements of the Law on the Protection of the Rights of Persons with Disabilities, Art. 4, para. 13.

It reflects the main results achieved in the dissertation. The designations of the formulas, figures and tables coincide with those in the dissertation work.

11. Critical remarks and recommendations

12. Personal impressions

I know the doctoral student briefly - from the time when he was a student for the acquisition of the "Professional Bachelor" qualification. From the review of the presented materials, I can say that for this period (from 2009 to the present), he has accumulated both engineering and pedagogical experience . All this is the basis for the creation of the "**REMOTE LABORATORY OF ELECTRONIC MEASUREMENT TECHNIQUES** " and the writing of this dissertation.

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

My recommendation to the doctoral student and as a guideline for future work is to develop methods for simultaneous access to the virtual laboratory on different topics at the same time. This will allow more exercises to be conducted by the students at the same time and will bring them closer to how they proceed in a real laboratory.

CONCLUSION

The dissertation work ***contains applied scientific and applied results that represent an original contribution to science*** and **meet all** the requirements of the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB), the Regulations for the Implementation of the ADSRB and the relevant Regulations of the Paisii Hilendarski University.

The dissertation shows that the doctoral student , **M.Eng. Angel Hristov Chekichev possesses** in-depth theoretical knowledge and professional skills in the scientific specialty "**Electronization (by branches and groups of scientific specialties)**" , **demonstrating** qualities and skills for independent conduct of scientific research.

In view of the above, I confidently give my ***positive assessment*** of the research conducted, presented by the above-reviewed dissertation, abstract, achieved results and contributions, and ***I propose to the esteemed scientific jury yes awarded the educational and scientific degree "Doctor"*** to **Mag. Eng. Angel Hristov Chekichev** in the field of higher education **5. Technical sciences** , professional field **5.2. " Electrical engineering, electronics and automation"** , doctoral program "**Electronization (by industries and groups of scientific specialties)**".

September 11 , 2026

Reviewer :.....

(signature)

Assoc. Prof. Eng. Borislav Milenkov PhD