Review

over dissertation paper for PhD graduation

Author of dissertation paper: mag. eng.Veneta Hristova Yosifova

Subject: „ Methods and means for observing the energy efficiency of buildings and constructions"

Discipline: 5. Technical sciences

Division: 5.2. Electronic, Electrical engineering and Automation

Scientific Area: 02.21.07 "Automated systems for information processing and management"

Supervisor: Prof. Dr. Eng. Dimitar Karastoyanov – IICT-BAC

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Dissertaton overview

The dissertation has 132 pages, containing five chapters, conclussion, scientifically-applied contributions, references, originality declaration and publications. 76 refferences are quoted: 7 from cyrilic, 42 from latin and 27 from internet. The dissertation is represented whithin 6 publications. The dissertation also includes figures, tables, mathematical equations presented whithin the chapters as follows:

№	Chapter number	Figures number	Tables number	Mathematical equations number
1	I	15	-	8
2	II	32	1	8
3	III	21	2	-
4	IV	13	-	-
5	V	2	-	-

1. Actuality of the problem solved in the dissertation in scientific and scientifically-applied matter.

The dissertation topic is related to contemporary and prespective field in non-destructive testing of constructions and materials, that provide the opportunity for discovering invisible defects and problems, which helps in their reparation and removal. The increasing of energy efficiency for buildings and facilities can be achieved with modern information and communication technologies, digitalisation, unique scientific infrastructure and different methods and means based on them.

This topic is very popular not only in the developed countries, but the whole world. The broad knowledge, theories, patents, models etc. highlights the need of deep understanding of the problem and the prespective of further developing and problem-solving.

2. Problem and literature understanding degree

Broad and detailed literature overview of the current European Union means, new innovative methods and thenologies for buildings and facilities energy efficiency reasearch is made. The presented work shows deep knowledge of the current topic, the actual problems and opportunities for their solving. Based on that, in the dessertation, a goal and few tasks are formulated.

3. Appropriateness between the goal and tasks and the achieved results

PhD student's analysis and conclusions based on the developed countries researches of the current methods and means for increasing buildings energy efficiency, give the opportunity for developing the subject and achieving the dissertation's desired tasks and goal. With innovative approach and tools, the modern testing of materials and constructions becomes useful for discovering invisible problems and defects, which made them repairable in time, without damage.

Based on the well-formulated, motivated and grounded goal and tasks, the student has developed the dissertation with scientific applications. The results show that the PhD student has choosed successfuly the apporach for achieving new results and scientifically-applied contributions.

The goal and tasks are formulated as follows:

Goal of the dissertaion

The goal of the dissertation is to observe the building's and facilities energy efficiency and to be suggested new methods and means for its increasing

Tasks of the dissertation

1. Overview, analysis and systematization of the main factors concerned building's energy efficiency;
2. Studying building's effect over climate changes;
3. Studying the current problems in building's energy efficiency;
4. To be proposed plan for energy efficiency increasing of typified office area in standard office building;
5. Conducting real experiments for testing and comparing modern heating methods and also discovering hidden defects in applied energy efficient solutions;
6. Analysis of the research results;

4. Brief analytical characterization and evaluation of the material's credibility.

The work is focused in real building's and constructions energy efficiency problems. An innovative approach and tools for determining climate factors and energy consumption impacts over buildings is presented; analysing existing methods and means for increasing building's energy efficiency, experiments for comparison between modern heating appliances, their heat loss and energy consumption optimisation; a model for incresing the energy

efficiency of typified module is suggested. The above work in the dissertation, gives a good impression with deep problem knowledge and ability of model creating. There is a match between theory and the experimental data. The presented commersialisation plan of the scientific applications is impressive.

The strusture of the dissertation work is as follows:

I. Overview, analysis and systematization of the main factors concerned building's energy efficiency
II. Existing means and methods for increasing energy efficiency
III. Innovative approaches for increasing energy efficiency of existing buildings and facilities
IV. Experiments; Conclusion
V. Scientific results commersialisation plan

5. Dissertation's science and scientificly applied contributions

I accept and appreciate PhD student's scientifically-applied contributions in her dissertation. They should be summed up as follows;

1. The problems in building's energy efficiency and and the state of modern scientific researches on this topic are analysed for determining the main factors that affect to the energy efficiency.
2. The influence over the climate changes and the energy consumption is observed.
3. The current methods and means for increasing building's energy efficiency are studied.
4. A model for increasing the energy efficiency of a typified office space in a typical office building is presented.
5. A real experiments for comparing the work of modern heating appliances are made. The results are described and analysed in addition to reduce the heat loss and energy consumption.
6. A real experiments for determining construction defects in solutions for energy efficiency. The results are described and analysed in addition to increase the energy efficiency.

6. Assessment of the degree of personal contribution of the PhD student in contributions.

I agree that the disseratation work and its contributions are personaly done by the PhD student in accordinance with her supervisor and his team members.

7. Assessment of the publications within the dissertation paper

In addition with the dissertation, the PhD student presented 6 publications, 4 of which are made entirely by herself — 3 in English and 1 on Bulgarian language; 1 including a team, on Eanglish, presented in a local international conference and one in 3rd place along with her supervisor at a international journal.

There are no student's applications for intelectual property patents and quoted references.

Overal dissertation publications are reflecting the initial topic and the main experimental results. Because of the publicatuons, the dissertaion results has been presented to the scientific comunity.

8. Real use of the dissertaion's results

The student has acomplished a wide spectrum of work, showing knowledge, deep understanding and competence. The work detailied describes the innovative approaches and instruments, informatic, digitalisation and automation processes and their management in the building construction sector in addition to research the most effective solutions for increasing existing building's energy efficiency and best practices in repairmnet works that lead to "green" buildings with zero energy consumption.

9. Asssesment of the autoreferate

The autoreferate contain 44 pages and significantly reflects dissertation's contents. It respond to the desired format and present the desired and accomplished goal and tasks, the experimental results, the main scientificly applied contributions and present the main accomplishments of the paper.

10. Notes, advices and comments

The dissertation work makes good impresion with deep topic knowledge, precision and desire for problem solving skills. The author has presented original scientifically-applied results, applied for increasing building's energy efficiency for existing and new buildings and facilities. This results reflect the desired goal and tasks in using innovative means, tools and tehnologies for reducing heat lossses and energy consumption. The examined field is actual and scientificaly prespective for further development. The presented paper is a finished scientific work.

I had some comments for the PhD student, which she had corrected.

I advise the PhD student to prepare more articles in international magazines and journals.

Conclusion

I know personaly the student mag. eng. Veneta Hristova Yosifova. I have direct observation from the begining of her studying and durring the whole dissertation preparation period, her partiscipation in scientific forums and international conferences. I know her supervisor prof. PhD. Dimitar Karastoyanov and his team from IICT-BAC very well. I have possitive evaluation for the PhD student and the team, which is backed by dissertation's results and scientific application.

In conclusion I would like to highlight that the author has done deep analysis of the problem, has evauated the outcome experimental results and has presented a detailed solution in new and prespective area.

All requirements of ЗРАСРБ, the application manual, and the special requirements for desrving a PhD title in IICT-BAC are fullfiled, based on the volume and the quality of the dissertation paper. Based on that I positively evaluate the paper and suggest that mag. eng. Veneta Hristova Yosifova should graduate with educational title " Doctor" in Discipline: 5. Technical sciences, Division: 5.2. Electronic, Electrical engineering and Automation, Scientific Area: 02.21.07 "Automated systems for information processing and management".

20.11.2018

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