OPINION

by assoc. prof. eng. Boyan Angelov Dochev PhD Technical University – Sofia, Plovdiv Branch

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

field of higher education 5. Technical Sciences

professional field 5.1 Mechanical Engineering

doctoral program "Methods for controlling and testing materials, products and equipment" at the

Department of Mechanical Engineering and Transport of the Faculty of Physics and Technology of

Plovdiv University "Paisii Hilendarski"

Author: master of engineering Nikolay Asenov Toshev Topic: "Research on active safety systems in automobiles"

Scientific Supervisors:

Assoc. Prof. Kaneta Ilieva Paskaleva PhD	Plovdiv University "Paisii Hilendarski"
Prof. Dr. Georgi Atanasov Mishev	Plovdiv University "Paisii Hilendarski'

1. General presentation of the procedure and the PhD student

Ву order № РД-22-1060 dated 09.05.2025 of the Rector of Plovdiv University "Paisii Hilendarski", I have been appointed a member of the scientific jury for ensuring a procedure for the defense of a dissertation on the topic "Research on active safety systems in cars" for the acquisition of the educational and scientific degree "doctor" in the field of higher education 5. Technical sciences, professional field 5.1 Mechanical engineering, doctoral program "Methods for controlling and testing materials, products and equipment" at the Department of "Mechanical Engineering and Transport" of the Faculty of Physics and Technology of Plovdiv University "Paisii Hilendarski". The author of the dissertation is m. eng. Nikolay Asenov Toshev - a PhD student in full-time education at the Department of "Mechanical Engineering and Transport" with scientific supervisors Assoc. Prof. Kaneta Ilieva Paskaleva PhD and Prof. Dr. Georgi Atanasov Mishev from the Plovdiv University "Paisii Hilendarski".

The set of materials on paper submitted by m. eng. Nikolay Asenov Toshev is in accordance with Art. 36 (1) of the Regulations for the Development of the Academic Staff of Plovdiv University "Paisii Hilendarski" and includes the following documents: a request to the Rector of Plovdiv University "Paisii Hilendarski" for the opening of the procedure for the defense of a dissertation; a curriculum vitae in European format; a report from the department council reporting the readiness to open the procedure and with a preliminary discussion of the dissertation; dissertation; abstract; a list of scientific publications on the topic of the dissertation; copies of the scientific publications; a declaration of originality and authenticity of the attached documents; a certificate of compliance with the minimum national requirements. The PhD student has attached four publications.

2. Actuality of the topic

Reducing road accidents, as well as improving the safety of all road users, is an extremely relevant problem not only in our country, but also worldwide. Of particular importance for solving this problem are the anti-lock braking system (ABS) and the automatic emergency braking system (AEB), which are the subject of research in this dissertation. Despite the proven effectiveness of ABS and AEB, there are a number of unresolved issues related to their functioning under various road and climatic conditions. The growing requirements for safer transport and the prospects for the

development of autonomous technologies in the automotive industry make the research and results of the presented dissertation relevant.

3. Knowledge of the problem

The detailed literature review of the problem, the critical analysis of modern achievements and the precisely formulated goals and objectives of the dissertation give me reason to note that the doctoral student knows the issue under consideration very well. This statement is also based on the fact that the doctoral student used 135 literary sources, of which 2 are in Cyrillic and 133 in Latin. All cited publications are after 2010. This shows that the PhD student is familiar with the most modern developments and research on the treated problem.

4. Research methodology

The research methodology in the dissertation includes: experimental research of the factors influencing traffic safety with activated and deactivated ABS/AEB systems; the object of research is real transport vehicles; modern measuring equipment was used. Statistical and mathematical models were used in processing the obtained results.

5. Characterization and evaluation of the dissertation work and contributions

The dissertation covers extensive experimental research on active safety systems of automobiles, which are structured in four chapters, conclusion, contributions and two applications. The obtained experimental results are processed accurately, analyzed thoroughly and the conclusions drawn after each chapter are reliable. On these conclusions, the scientific-applied and applied contributions of the dissertation are correctly formulated.

6. Assessment of the PhD student's publications and personal contributions

The PhD student has presented 4 scientific publications, of which: 1 in an edition with an impact factor (Scopus); 2 in international conferences; 1 in a national scientific collection. Two of them are independent and two in co-authorship, with him in first place. This gives me reason to claim that the personal contributions of the doctoral student are undeniable. All publications reflect the results and contributions of the dissertation work.

7. Abstract

The abstract is prepared accurately and accurately, reflects all achieved results, analyses and contributions from the research. It meets the generally accepted requirements for preparing such material.

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

I have no significant comments on the presented dissertation. It is not clear how exactly the cars were selected for conducting the experiments – there is no justification.

I believe that the doctoral student should continue his research in this direction, to obtain additional results and conclusions that can be used to significantly reduce traffic accidents.

CONCLUSION

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

The dissertation shows that the PhD student, m. eng. Nikolay Asenov Toshev, possesses indepth theoretical knowledge and professional skills in the field of active safety systems in the car. He possesses in-depth theoretical knowledge and demonstrates qualities and skills for independent conduct of scientific research. Due to the above, I confidently give my positive assessment of the conducted research, presented by the above-reviewed dissertation, abstract, achieved results and contributions, and I propose to the scientific jury to award the educational and scientific degree "doctor" to m. eng. Nikolay Asenov Toshev in the field of higher education: 5. Technical Sciences, professional field 5.1 Mechanical Engineering, doctoral program "Methods for controlling and testing materials, products and equipment".

11. 06. 2025г.

Prepared the opinion:

assoc. prof. eng. Boyan Dochev PhD