

OPINION

by **Prof. Lyubka Doukovska, PhD, DSc**
from the Institute of Information and Communication Technologies,
at the Bulgarian Academy of Sciences,
on the Thesis for awarding educational and scientific degree PhD,
under the Scientific Field 5. Technical sciences,
the Professional Area 5.2. Electrical engineering, Electronic and Automation,
the Scientific Specialty 02.21.07. Automation, Information and Control Systems

Author of the PhD Thesis: **Nikola Nikolaev Sabotinkov**

PhD Thesis Title: **Investigation and management of protection systems for
underground transport**

In accordance with Order No. 175 from 18.07.2019 of the Director of the Institute of Information and Communication Technologies, I have been appointed as a member of the Scientific Jury regarding the PhD thesis of **Nikola Nikolaev Sabotinkov** for awarding the educational and scientific degree “Doctor of Philosophy” (PhD).

In order to form the final evaluation of the PhD thesis, the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* are implemented the specific requirements in the Act’s Institutional Regulation shall be taken into consideration, where the respective norms are:

1. Pursuant to Art. 6 (3) of the *Development of Academic Staff Act in the Republic of Bulgaria*, PhD thesis should contain scientific or scientific-applied results, which represent an original contribution in science. The PhD thesis must indicate that the candidate has in-depth theoretical knowledge of the relevant specialty and ability for independent research.

2. According to Art. 27 (2) of the specific requirements in the Act’s Institutional Regulation, PhD thesis should be presented in a form and volume corresponding to the specific requirements of the primary unit. The PhD thesis should contain: a cover page;

content; introduction; exhibition; conclusion - a summary of the results obtained with a declaration of originality; bibliography.

The PhD thesis consists of 111 pages. Its structure includes introduction, five chapters, the PhD thesis scientific contributions, a list of 50 cited sources, a list of the publications based on the PhD thesis and a request for originality.

The aim of the PhD thesis is to study and optimize various innovative approaches for management of security systems in underground urban transport, in order to improving the air quality and passenger's safety.

To accomplish this, the following tasks have been set:

1. To review, analyze and systematize the factors affecting safety and security in underground rail transport.
2. Investigate the concentration of fine dust particles in the subway.
3. Investigate existing solutions to reduce fine dust particles concentration and improve underground rail safety.
4. To optimize the ventilation in the subway and tunnels.
5. To propose innovative approaches with the use of up-to-date underground rail security systems.
6. To present experimental results and simulation modelling with new security systems.
7. The results obtained should be analyzed.

I find that the aim and the problems formulated reflect the topicality and significance of the presented dissertation work, as well as the possibility to apply the results obtained in the engineering practice.

The submitted list of publications contains six articles. The data presented in this way give me reason to conclude that the study was done on its own and was provided with the necessary publicity. No data citations are provided.

I accept that the contributions so formulated could be considered to have scientific and common application. This separation would allow detailing the results obtained in accordance with the specificity of their significance. Such defined contributions can be defined as enriching the existing scientific field with new knowledge.

The PhD abstract has a volume of 42 pages. It faithfully reflects the essence and content of the PhD thesis, including the purpose, subject, object and tasks of PhD thesis research and the ways of their realization.

In order to form the final evaluation of the PhD thesis, the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* and its Implementation Rules are to be taken into account, according to which I have the following remarks and recommendations:

1. The content of the dissertation does not meet the requirements of Art. 27 (2) of the *Development of Academic Staff Act in the Republic of Bulgaria*. The PhD thesis should contain a conclusion - summary of the obtained results and end with a bibliography.
2. The list of the references doesn't comply with the requirements for bibliography.
3. There are no directions for future work, based on the results of the PhD thesis.
4. The PhD student should direct his efforts to increase his contributions to reputable international publications.

In conclusion, I accept that the requirements of the *Development of Academic Staff Act in the Republic of Bulgaria* and the specific requirements in the Act's Institutional Regulation are fulfilled. After my introduction to the dissertation thesis and its publications, an analysis of their significance and the contributions they make, I give my positive assessment and I recommend to the Honorable Jury to award the educational and scientific degree PhD to **Nikola Nikolaev Sabotinkov** in the Scientific Specialty 02.21.07 Automation, Information and Control Systems.

26.08.2019

Sofia

Signature:

**NOT FOR
PUBLIC RELEASE**

/Prof. Lyubka Doukovska, PhD, DSc/