

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: **4. Natural Sciences, Mathematics and Informatics**,
the Professional Area: **4.6. Informatics and Computer Sciences**,
the Scientific Specialty: **01.01.12. Informatics**

Author of the PhD Thesis: **Atanas Petrov Ouzounov**

PhD Thesis Title: **Speech detection in speaker recognition systems**

In accordance with Order No. 55 from 09.03.2020 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 **Atanas Petrov Ouzounov** for awarding the educational and scientific degree “Doctor of Philosophy” (PhD).

As a member of the Scientific Jury I have received:

1. Order No. 55 from 09.03.2020 of the Director of the Institute of Information and Communication Technologies.
2. Dissertation for the educational and scientific degree PhD.
3. Abstract of the dissertation for the educational and scientific degree PhD.
4. Copies of the publications included in the PhD thesis.
5. Reference to the noted citations of the publications included in the PhD thesis.

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 164 pages. Its structure includes introduction, five chapters, the PhD thesis scientific contributions, a request for originality, a list of 151 cited sources.

The aim of the PhD thesis is to create robust marks designed for speech detection algorithms and their study in the context of speakers recognition from a voice signal recorded over a telephone channel.

To accomplish this, the following tasks have been set:

1. Definition of robust marks intended for speech detection based on the properties of the spectral autocorrelation function and the spectrum of group delay and the study of their characteristics.

2. Develop an approach for determining the boundary points of a voice message, including an algorithm for calculating adaptive thresholds and a deterministic finite state machine.

3. Development of algorithms for determining boundary points and experimental study of their effectiveness using the marks proposed in the thesis for verification of fixed-phrase speakers.

4. Development of algorithms for detection of speech segments and experimental study of their effectiveness using the marks suggested in the dissertation with the text-independent speakers identification.

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 papers. 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. 25 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 40 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, so I should note that all remarks made by me during the preliminary discussion of the PhD thesis are reflected in its final version.

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 **Atanas Petrov Ouzounov** in the Scientific Field: **4. Natural Sciences, Mathematics and Informatics**, the Professional Area: **4.6. Informatics and Computer Sciences**, the Scientific Specialty: **01.01.12. Informatics**.

06.04.2020

Sofia

Signature:



/Prof. Lyubka Doukovska, PhD, DSc/