

O P I N I O N

of prof. dr. Nikolay Dimitrov Madzharov – Technical University of Gabrovo

regarding the submitted materials so as to participate in a competition for holding the academic position of **associated professor**

in the area of higher education: **5. Technical Sciences,**

professional trend: **5.2. Electrical Engineering, Electronics and Automation,**

scientific subject: **Electric Power Supply and Equipment (Electronic devices in power generation)**

Senior assist. prof. Hristo Todorov Ibrishimov is participating in the competition for associated professor, published in the Official Gazette, issue 68/31.07.2020 and on the website of TU-Gabrovo, for the needs of the Department of Electric Power Supply and Equipment at the Faculty of Electrical Engineering and Electronics, Technical University of Gabrovo.

1. OVERVIEW OF THE CONTENT AND RESULTS OF THE WORKS SUBMITTED

The scientific works submitted by senior assist. prof. PhD Hristo Ibrishimov so that he can participate in the competition for holding the position of an associated professor could be summarized in the following main trends:

1.1. Habilitation work – 10 scientific publications in journals refereed and indexed in world-renowned data bases providing scientific information [B1 – B10]

1.2. Development of a device for contactless recognition of substances, materials, mixtures and their characteristics

That thematic group covers publications [B.4.2], [B.4.3], [Г.8.1], [Г.8.], [Г.8.5], [Г.8.6], [Г.8.7], [Г.8.8], which present the application of an ultrasonic method for contactless recognition of substances and their physical characteristics. An ultrasonic signal reflected by the object is used as a database source. A development of a device for generating, forming, emitting and receiving an ultrasonic signal with parameters set in advance is presented [B.4.2]. Based on that, procedures of attribute classifiers for alcohol percentage [B.4.3], for stages of milk coagulation [Г.8.4], for recognition of the amount of dry matter in carbonated beverages [Г.8.8], for recognition of plastics [Г.8.5, Г.8.7] have been synthesized. In addition, a system for output control of the vacuum when packaging bulk products [Г.8.6] and an artificial neural network analyzing the hardness of steel pieces [Г.8.1] have been developed.

1.3. Computer-assisted modelling of processes, phenomena, devices and systems

This thematic area covers interactive computer models of processes, devices and systems of different technological purposes. The synthesis and analysis are based on an abstract model where specific properties and conditions limiting the media building them are set. Models for modelling the electromagnetic and thermal field of induction heating devices have been developed [B.4.1], [B.4.5], [B.4.8] and [Г.7.1]. A methodology for defining the equivalent parameters of the inductor-piece system in multi-unit inductors for volumetric heating has been developed [Г.7.2]. On the basis of the algorithm and computer models been developed, the following has been implemented: modernization and adaptation of systems for controlling power sources of induction heating [Г.8.2], [Г.8.3], [Г.8.18], electromagnetic analysis of contactless transmitters of low capacity [B.4.9], modelling of LED lighting and secondary lenses of different purposes for street, indoor and outdoor lighting have been developed [B.4.6], [B.4.7], [Г.7.3] and [Г.8.15].

1.4. Scientific-applied research and implementation related to the use of industrial LED lighting and virtual distance learning technologies at the Technical University of Gabrovo

The first trend is linked to investigating the photometric colorimetric characteristics, the temperature modes and lighting parameters of LED lighting [B.4.4], [B.4.10] and [Г.8.13]. On that basis an electricity audit of existing lighting networks in the town of Gabrovo, town of Pavlikeni and urban areas in the Municipality of Pavlikeni has been implemented [Г.8.12], [Г.8.14]. The developments related to distance learning refer to the participation of the author in the introduction of an e-learning system and virtual library into the teaching process at the Technical University of Gabrovo and studying the training possibilities of the target groups and blended learning in the master degree course of Automotive Electronics [Г.8.9], [Г.8.11].

2. General characteristic of the Candidate's performance

2.1. Teaching practice

The Candidate for the academic position of an associated professor, senior assist. Prof. PhD Hristo Ibrishimov, was appointed as an assist. prof. at the Department of Electric Power Supply and Equipment at the Technical University of Gabrovo in 2014. He is a leading lecturer of 5 courses designed for part-time and full-time students following a bachelor degree course and he worked out study programmes for 3 of them. He submitted 2 teaching materials for the competition and all were reviewed. Their language and style are accurate and clear.

Over the last 5 years 18 students following a bachelor degree course and 17 students following a master degree course have successfully graduated under his supervision. He has actively taken part in the set-up of a new lab in Electronics.

The Candidate is an independent user of English and Russian, which allows him to keep track of the latest publications in his scientific field and to communicate with his colleagues abroad.

2.2. Scientific and scientific-applied activities

Senior assist. prof. PhD Hristo Ibrishimov reviewed 17 graduation theses and the following number of scientific papers delivered at international conferences - HiTech 2019 – 2 papers, ET'20 - 3 papers, UNITECH – 10 papers. He is a member of the Union of Scientists in Bulgaria.

There is a document verifying his participation in 5 scientific research projects: 2 of them under Operational Programmes, 1 national scientific research project and 2 university scientific research projects within the Scientific Research Fund where he was a project leader.

2.3. Implementation activities

There isn't any information on the implementation of the Candidate's developments.

The assessment of the Candidate in the scientific community is related to the citations specified in his documents. There is a list of 8 citations, all of which are indexed. As result, his h-index is 1. Senior assist. prof. Hristo Ibrishimov has developments in manufacturing companies, reported in 7 publications at international indexed conferences and journals. On that basis I can conclude that the Candidate is an established researcher who has published his results in renowned scientific journals and proceedings in the area of the competition and has transferred his scientific achievements to practice.

Overall, taking into account the submitted scientific publications, citations, published teaching materials and his participation in scientific research projects, the Candidate, senior assist. prof. Hristo T. Ibrishimov fully meets the minimum national requirements for holding the academic position of an associated professor in the area of Technical Sciences in higher education, stipulated in art. 26 of the Act on Development of the Academic Staff in the Republic of Bulgaria and the minimum requirements according to PPNSZAD of the Technical University of Gabrovo.

3. Contributions. Significance of contributions for science and practice

I think that the contributions of senior assist. prof. Hristo T. Ibrishimov are scientific-applied and applied. The first ones are related to the development of new methods, software algorithms and tools for studying new effects and achieving better characteristics and parameters of the systems developed.

The following could be referred to the scientific-applied contributions:

1. Developing a mathematical model of the process of volumetric induction heating of cylindrical pieces [B.4.1],[B.4.5], [B.4.8], [Г.7.1].
2. Developing a methodology for calculating the equivalent parameters of an inductor-piece system when the inductors are connected in series [Г.7.2], [Г.8.2], [Г.8.3], [Г.8.18].
3. Developing a specialized applied software in LabVIEW environment for processing signals from ultrasonic sensors so as to develop automated classifiers for recognizing alcohol percentage, for stages of milk coagulation, for recognizing the amount of dry matter in carbonated beverages for recognizing plastics and for applying an artificial neural network as a classifier of hardness of steel pieces [Г.8.4], [Г.8.8], [Г.8.5], [Г.8.7], [Г.8.6], [Г.8.1].

Applied contributions:

1. Developing a device for generating, forming, emitting and receiving an ultrasonic signal with parameters set in advance [B.4.2], [B.4.3].
2. Synthesizing and developing models of a high-frequency transformer, a system for inductive energy transfer of low capacity and a model for investigating the operating temperature of industrial lighting [B.4.9].
3. Developing parts of a methodology for interactive designing of secondary optic lenses for LED lighting and building a 3D model of an optic system of indoor LED lighting. [B.4.6], [B.4.7], [Г.7.3] и [Г.8.15].

4. Evaluation of the personal contribution of the Candidate

I believe that the contributions are personally made by the Candidate. This is demonstrated by the submitted 31 publications, where he is an independent author of 5 publications and he is the first co-author of 2 publications.

5. Critical comments and recommendations

I don't have any serious remarks and recommendations in relations to the materials submitted. I would just like to point out the following:

- the teaching materials are not included in the list of publications related to the competition;
- the formulated contributions are not summarized as scientific-applied and applied;
- there are not any documents regarding the Candidate's implementations and undoubtedly there are such, especially those linked to the topic of ultrasonic technology and induction heating;
- I would recommend that the Candidate should spend more time on implementing his scientific-applied results in business in his future career development.

6. Personal impression

I have known senior assist. prof. PhD Hristo Ibrishimov since 2003 as an undergraduate and postgraduate student at the Department of Electronics, then as a programmer at the University ICT Centre, and finally as a lecturer at the Department of Electric Power Supply and Equipment. He was the initiator of setting up a lab in Electronics. He is noted for his independence, initiative and diligence.

7. Conclusion

Taking into account the above mentioned, I propose senior assist. prof. Hristo Todorov Ibrishimov to be selected as an associate professor in the area of higher education: 5. Technical Sciences, professional trend: 5.2. Electrical Engineering, Electronics and Automation, scientific subject: Electric Power Supply and Equipment (Electronic devices in power generation)

07.12.2020

Member of the jury: /signature/

/ prof. dr. Nikolay Dimitrov Madzharov/