O P I N I O N

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of the materials submitted for participation in the competition
for occupying the academic position "Associate Professor" in
field of higher education - 5. Technical sciences,
by professional direction - 5.3. Communication and computer technology,
specialty - "Computer systems, complexes and networks" (Schematic technology, Microprocessor technique)

In the competition for associate professor, announced in the State Gazette, no. 54/25.06.2024 and on the TU-Gabrovo website for the needs of the "Computer Systems and Technologies" department at the "Electrical Engineering and Electronics" faculty, as a candidate, Chief Assistant Professor eng. Hristo Stefanov Kilifarev, PhD.

1. Overview of content and results in the presented works

Ch. Assistant Professor eng. Hristo Stefanov Kilifarev, PhD, participated in the competition for associate professor with a total of 33 publications, 1 textbook on "Schematic technology" and 1 teaching aid - "Manual for laboratory exercises in microprocessor technique". The presented publications were published in English (17 items) and in Bulgarian (16 items).

The candidate's publications can be classified as follows:

- 11 scientific publications in publications that are referenced and indexed in world-renowned databases with scientific information (Scopus - 11, Web of Science - 1);
- 22 scientific publications in non-refereed peer-reviewed journals or in edited collective volumes;
- 7 independent, 26 co-authored, and in 6 of the publications the candidate is the first author;
- 1 publication with an impact factor.

The works presented can be attributed to 6 thematic areas. In the first, problems related to "Design and development of automated systems" are considered, and there are 7 publications on it. The software and hardware part in the development of an automated system for greenhouse cultivation of mushrooms [B.4.1, B.4.2], monitoring for metal fragments in food products [B.4.3, B.4.4], a dryer for processed meat for domestic purposes [G.8.6] are presented.

Publication [G.8.11] presents an express approach for firmware synthesis for microprocessor systems for small automation based on the 8-bit microcontroller C8051F120.

A schematic solution of a food identification system is presented in [G.8.18]. The system is designed for quality control and food identification using an ultrasonic non-contact method.

The second dedicated area is about "Specialized Platform for Video Management in Online Learning", on which the applicant has 1 publication [B.4.5]. The publication examines the design and implementation of the specialized educational platform Hydra Educational Platform (HEP) for the educational purposes of TU-Gabrovo.

In my opinion, the most important are the publications in the third direction - "Non-contact research of environments, materials and speed" with 17 publications. Publications [B.4.7, B.4.6, B.4.8, G.8.10, G.8.14, G.8.15, G.8.5, G.8.7, G.8.12, G.8.13] refer to the development and implementation of a method, methodology, hardware and software provision for its application for non-contact research and recognition of environments and materials by analyzing the reflected ultrasonic wave by means of image recognition methods. A spectral model based on wavelet transform was developed. In [G.7.1], a model is proposed for determining the boundary distances of the working area of parallel ultrasonic sensors.

The work [G.8.4] presents the development of a controller based on the Arduino platform for measuring wind speed and direction.

Works [G.8.16, G.8.17, G.8.19] present the approach and implementation of a device for measuring the distance to stationary objects using ultrasonic waves.

In [G.8.1, G.8.2] the approach and implementation of a device for measuring the speed of movement of objects using a microwave radar module are presented.

In the fourth area, attention is paid to the problems with "Design and Development of Microcontroller Based Local Short-Term Weather Forecasting Systems". They are based on monitoring of temperature, atmospheric pressure, air humidity, wind speed and direction. On this subject, the candidate has 4 publications [G.8.21, G.8.20, B.4.10, B.4.9].

The author's fifth area of interest is related to "Optimizing Big Data for E-Stores". The thematic direction includes 1 publication [G.8.3].

The sixth area is aimed at "Research in the field of electric vehicles" [G.8.8, G.8.9, G.8.22]. An approach for simulating the process of processing of noisy signals is proposed. A MATLAB model is created for the simulation study of an electromechanical brake and the main characteristics of different types of rechargeable batteries are described. A general diagram of a device that has functional capabilities to perform identification, charging and servicing of rechargeable batteries is presented.

2. General characteristics of the applicant's activity
2.1. Educational and pedagogical activity

From 2002 to 2017 Ch. Assistant Professor Hristo Stefanov Kilifarev, PhD, works in the department "Automation, information and control systems" at TU-Gabrovo, holding the academic positions of "assistant", "senior" and "chief assistant". From 2018 to the present, he is "chief assistant" in the "Computer systems and technologies" department.

Over the years, Hristo Kilifarev, PhD, has lectured for bachelor's degrees in the disciplines "Computer Graphics", "Multimedia Systems", "Programming of Embedded Systems", "Computer Peripherals", "Computer Graphics Systems", " Modeling and visualization of objects", Computer graphics III", "Web design and multimedia products", "Multimedia design and presentation" and for the master's degree - "Multimedia systems and Web design", "Computer graphics" and "Computer Peripherals".

As a teacher, he leads seminars and laboratory exercises in the disciplines "Schematic technology", "Computer graphics", "Multimedia systems", "Programming of embedded systems", "Microprocessor technique", "Artificial intelligence", "Computer peripherals", "Computer graphics systems", "Modeling and visualization of objects", "Computer graphics III", "Web design and multimedia products" and "Multimedia design and presentation" for the bachelor's degree and in the disciplines "Multimedia systems and Web-design", "Systems with artificial intelligence", "Computer Graphics", "Computer peripherals" and "Microprocessor technique" for the Master's degree.

Ch. Assistant Professor eng. Hristo Kilifarev, PhD, is the author of a textbook on "Schematic technology" (paper and electronic edition) and of a teaching aid - "Manual for Laboratory Exercises in Microprocessor Technique" (electronic edition).

To date, he has participated in the development of 49 curricula. For the period from 2017 to now Ch. Assistant Professor Hristo Kilifarev supervised a total of 59 graduate students, reviewed 27 theses and participated in thesis defense committees.

2.2. Scientific and scientific-applied activity

Ch. Assistant Professor Hristo Stefanov Kilifarev, PhD, participated in one external project under the operational program "Science and education for intelligent growth" and 5 internal scientific or educational projects at TU-Gabrovo. Ch. Assistant Professor Kilifarev also led one internal project at TU-Gabrovo.

2.3. Implementation activity

For educational purposes, the specialized educational platform Hydra Educational Platform (HEP) was designed and implemented at TU-Gabrovo, which serves to manage video recordings during online learning.

A controller for controlling the ultrasonic measuring head for a system for remote recognition, characterization and classification of substances, materials and states of mediums in real time has been developed and implemented.

On the guided disciplines Ch. Assistant Professor Hristo Kilifarev, PhD, has developed numerous laboratory exercises and stands.

3. Contributions. Significance of contributions to science and practice

In the self-assessment of contributions presented by the candidate are formulated 3 scientific, 7 scientific and applied and 9 applied contributions. I believe that the presented contributions accurately reflect the results obtained from Ch. Assistant Professor Kilifarev. I accept the contributions requested by Ch. Assistant Professor Hristo Stefanov Kilifarev, PhD, and I believe that they are completely sufficient for holding the academic position of "associate professor".

4. Evaluation of the candidate's personal contribution

After a thorough acquaintance with the presented works of Ch. Assistant Professor Kilifarev I am convinced that the results achieved from the research and development carried out were obtained entirely with his participation. With the presented works Kilifarev, PhD, demonstrates that he is an established scientist with in-depth knowledge and skills for research and teaching activities.

5. Critical notes and recommendations

I have no critical remarks, but I recommend that the candidate in the future should make an effort and develop research projects of which he is the leader with the possibility of implementation.

6. Personal impressions

I know Ch. Assistant Professor Hristo Stefanov Kilifarev, PhD, from our joint work on the project "Design and development of a device for non-contact ultrasonic study of materials intended for incorporation into automated production systems", financed by the competition "Development of the scientific infrastructure" - 2009 and I consider that, as a person with proven professional, technical and communicative qualities, he possesses the necessary skills and business qualities to fulfill the academic position of "associate professor". I believe that the presented information regarding the academic work and scientific production of the candidate meets the requirements for occupying the academic position "associate professor", according to the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for its Implementation, as well as the Regulations for the acquisition of scientific degrees and occupying academic positions at TU - Gabrovo.

7. Conclusion:

Bearing in mind the above, I propose Chief Assistant Professor Hristo Stefanov Kilifarev, PhD, <u>to be elected</u> as an "Associate Professor" in the field of higher education - 5. Technical sciences, professional direction - 5.3 Communication and computer technology, specialty - "Computer systems, complexes and networks" (Schematic technology, Microprocessor technique).

07.11.2024   Jury member: /signature/
                                                          /Assoc. Prof. eng. Nikolay Atanasov Shopov, PhD/