

REVIEW

by Prof. Dr. Sotir Nikolov Sotirov,
University "Prof. Dr. Asen Zlatarov" – Burgas

on the materials submitted for the competition

for the academic position of "Associate Professor"

in the professional field 5.3 Communication and Computer Technology

Candidate : Assistant Professor Dr. Eng. Hristo Stefanov Kilifarev

Field of higher education: 5. Technical Sciences

Professional field: 5.3 Communication and Computer Technology

Specialty: "Computer Systems, Complexes, and Networks" (Circuitry, Microprocessor Technology)

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1. Brief Biographical Information

Hristo Kilifarev was born on July 10, 1976, in Gabrovo. He completed his Master's degree in "Computer Systems and Technologies" at the Technical University of Gabrovo in 2002 and defended his Ph.D. in the same field in 2017. His career has been primarily linked to the Technical University of Gabrovo, where he has served as an Assistant Professor in the Department of Computer Systems and Technology since 2018. He is fluent in English and Russian, and as a software engineer, he works with numerous platforms and programming languages.

2. General Description of the Submitted Materials

The candidate has provided numerous documents, including: the CV of Assistant Professor Dr. Eng. Hristo Kilifarev, containing detailed information on his education, professional experience, scientific, and teaching activities; a document containing summaries of his scientific work after defending his Ph.D., organized into thematic areas such as the design of automated systems, video management in online education, and contactless material examination; an author's report outlining his scientific and applied contributions, including developed methods and applied solutions in various industrial fields; a list of known citations of his scientific publications in international scientific journals, reflecting the recognition of his contributions in scientific literature; a list of disciplines taught by Assistant Professor Kilifarev, covering basic and specialized courses in computer science and multimedia technologies, as well as information on his development of curricula, emphasizing his contribution to the educational process and his

methodological role; a list of students he has supervised or reviewed, along with his participation in thesis defense committees, highlighting his role in supporting students' research efforts.

According to the submitted documents, Assistant Professor Dr. Hristo Kilifarev enters the competition with:

- Total publications: 33
- Solo publications: 7
- Articles in refereed and indexed databases (Scopus): 1
- Articles in non-refereed journals: 3
- Articles in non-refereed journals in Bulgaria: 2
- Articles in non-refereed journals abroad: 1
- Publications with impact factor (WoS): 1
- Reports in refereed and indexed databases (Scopus): 10
- Reports in non-refereed journals: 19
- Reports at international conferences in Bulgaria: 15
- Reports at international conferences abroad: 3
- Reports at national conferences in Bulgaria: 1
- Published textbook: 1
- Published teaching manual: 1

3. Impact of the Candidate's Scientific Publications in Literature (Known Citations)

The publications of Assistant Professor Dr. Eng. Hristo Kilifarev have been cited a total of 8 times in scientific journals indexed in Scopus and Web of Science. Key areas of citation include:

1. Monitoring Devices and Ultrasonic Research – His developments in monitoring metal fragments in food and ultrasonic devices for material research have been cited in 4 works.
2. Contactless Ultrasonic Recognition – His studies on ultrasonic recognition of explosives and materials have been cited in 2 publications.
3. Weather Forecasting with Embedded Systems – His work on short-term weather forecasting has been cited in 2 publications, highlighting its practical application and effectiveness.

My review of SCOPUS indicates the candidate has 13 documents, 8 citations excluding self-citations, and an h-index of 1.

4. General Overview of the Candidate's Activities

4.1. Educational and Pedagogical Activity (Work with Students and Doctoral Students)

Assistant Professor Dr. Eng. Hristo Kilifarev has a varied and active contribution to teaching in the field of computer systems and technology. He conducts lectures and exercises in courses such as "Computer Graphics," "Multimedia Systems," "Embedded Systems Programming," and "Artificial Intelligence." He has developed curricula for bachelor's and master's programs covering courses such as "Computer Graphics Systems," "Computer Periphery," and "Modeling and Visualization of Objects." In addition, he has supervised over 50 undergraduate and graduate students and reviewed numerous theses in computer technology. He actively participates in thesis defense committees, supporting students through their final stages of study.

4.2. Scientific and Applied Research Activity

The scientific and applied research activity of Assistant Professor Dr. Eng. Hristo Kilifarev spans multiple areas:

1. Design and Development of Automated Systems – covering hardware and software solutions for microcontrollers used for monitoring and automation in sectors such as greenhouse production and the food industry.
2. Video Management in Online Education – the Hydra platform was developed for video optimization and management in online settings, facilitating the educational process at TU-Gabrovo.
3. Contactless Examination of Environments and Materials – includes ultrasonic technologies for non-destructive testing, classification, and material identification using microcontrollers and signal processing algorithms.
4. Weather Forecasting with Microcontrollers – focuses on short-term meteorological forecasting systems that use microcontrollers to collect and process data.
5. Big Data Optimization for E-Commerce – aimed at using big data for analysis and optimization in electronic commerce.
6. Research in the Field of Electric Vehicles – includes simulations and analyses related to braking systems and batteries for electric vehicles.

4.3. Implementation Activity

The implementation activity of Assistant Professor Dr. Eng. Hristo Kilifarev, as reflected in his scientific contributions, consists of the following practical applications and developments:

1. Ultrasonic Apparatus for Contactless Material Recognition – including applications in the field of explosives and metals, achieving high classification and identification results.
2. Specialized Microcontroller Systems – developing automated systems for greenhouse production and food product monitoring, as well as prototypes for various industrial and laboratory applications.

3. Models and Devices for Movement Measurement and Weather Forecasting – developing measurement systems and anemometers, with an algorithm for short-term weather forecasting implemented through an autonomous device.

4. Video Management System for Online Education – implemented in a university setting, optimizing access and management of educational video recordings.

5. Home Meat Dryer with Arduino Microcontroller – automating the drying process in a closed chamber, allowing controlled temperature and humidity for home-processed foods.

These activities demonstrate the successful application of scientific developments in various industrial and educational environments, supporting the implementation of modern technologies and solutions.

4.4. Contributions (Scientific, Applied, Practical)

The candidate has provided the following summary of contributions:

Scientific Contributions

- A method for remote (contactless) study and recognition of environments and materials through analysis of reflected ultrasonic waves was proposed and implemented. A spectral model based on wavelet transformation was developed.

- A methodology for contactless recognition and classification of materials and environments was developed.

- An approach to recognize and classify materials using artificial neural networks was created.

Applied Contributions

- A method for the recognition of explosives (Ammonite, Ammonite V, and TNT) was developed and tested, achieving a classification error rate of 0%.

- A method for metal recognition was developed and tested, including aluminum, stainless steel, brass, cast iron, copper, and structural steel, achieving a classification error rate of 0%.

- A model was proposed for determining the boundary distances of the working area of parallel ultrasonic sensors.

5. Evaluation of the Candidate's Personal Contribution

The evaluation highlights Assistant Professor Dr. Hristo Kilifarev's significant individual contribution to research projects and publications. He has 12 solo articles covering fields related to automated systems, contactless material recognition, and ultrasonic research.

