

O P I N I O N

by Prof. Dr. Eng. Iliya Slavov Zhelezarov

regarding the materials submitted for participation in the competition for the academic position of Associate Professor in the field of higher education “Technical Sciences” professional field “Mechanical Engineering” specialty “Electronic (Analog and Digital) Measuring Transducers and Instruments”

In the competition for Associate Professor, announced in the State Gazette, issue 48/13.06.2025, and on the website of the Technical University of Gabrovo for the needs of the Department of Mechanical Engineering and Instrumentation at the Faculty of Mechanical Engineering and Instrumentation, the candidate is Dr. Borislav Atanasov Georgiev, Senior Assistant Professor at the same department and faculty of the Technical University of Gabrovo.

1. Review of the Submitted Works

For participation in the competition, Senior Assistant Dr. Borislav Georgiev has submitted all documents required under the Act for the Development of the Academic Staff in the Republic of Bulgaria, its regulations, and the Regulations for the Acquisition of Academic Degrees and Occupation of Academic Positions at the Technical University of Gabrovo. The submitted materials include the monograph “Adaptive Methods for Controlling the Dynamics of Electrohydraulic Systems,” published by the University Publishing House “Vasil Aprilov,” Gabrovo, 2025; 11 scientific publications indexed in internationally recognized scientific databases (Scopus and Web of Science), three of which possess IF and/or SJR metrics; 10 peer-reviewed publications in non-indexed journals or edited collective volumes and Laboratory Manual in Elements of Automation.

In 2020, the candidate defended his doctoral dissertation titled “Study and Optimization of the Dynamics of an Electrohydraulic Servo Drive System.”

The quantitative indicators required for the position of Associate Professor are fully satisfied. The significant number of citations -11 of which appear in indexed international databases attests to the impact and recognized quality of his research work.

2. General Overview of the Candidate's Activities

2.1. Teaching Activity

Borislav Georgiev began his teaching career as an Assistant Professor in the Department of “Mechanical Engineering and Instrumentation” at the Technical University of Gabrovo in 2018, and since 2020 has been a Senior Assistant Professor following the successful defense of his doctoral dissertation.

Senior Assistant Dr. Borislav Georgiev has delivered lectures in 6 academic disciplines and conducted practical classes in 9 disciplines in the “Bachelor” and “Master” degree programs. Most of the disciplines are related to the field of the competition—electronic measuring transducers and instruments (Elements of Automation, Sensors in Mechatronics, Diagnostics of Mechatronic Devices and Systems, Measuring Transducers, etc.).

He has participated in the development of 7 curricula for the disciplines he teaches. His teaching activity fully meets the requirements for occupying the academic position of “Associate Professor” at the Technical University of Gabrovo.

2.2. Research and Applied Scientific Activity

For participation in the competition, Senior Assistant Dr. Borislav Georgiev has submitted 1 monograph and 26 scientific publications (articles and conference papers), of which 11 are in indexed and referenced editions (1 with IF in Web of Science, and 2 with SJR in Scopus). Of the 26 publications, 4 are single-authored, and in 10 publications he is the first author, clearly demonstrating his ability to formulate and present scientific ideas and results.

The candidate has participated in 6 scientific projects, including 4 internal university projects at the Technical University of Gabrovo, as researcher R1 in project BG05M2OP001-1.002-0023 “Centre of Competence Intelligent Mechatronic, Eco- and Energy-saving Systems and Technologies” under the Operational Programme “Science and Education for Smart Growth” and as researcher R2 in project BG16RFPR002-1.014-0005 “Centre of Competence Intelligent Mechatronic, Eco- and Energy-saving Systems and Technologies” under the Operational Programme “Scientific Research, Innovation and Digitalisation for Smart Transformation”.

2.3. Implementation Activity

Although no direct documentation of implementation is included, Dr. Georgiev’s work within the Centre of Competence demonstrates his involvement in the introduction of calibration procedures for instruments measuring linear and angular quantities.

Many results of his teaching and research activities are incorporated into the training process and laboratory practice.

3. Contributions and Their Significance for Science and Practice

In the monograph “*Adaptive Methods for Control of the Dynamics of Electrohydraulic Systems*” and the publications related to the competition, Senior Assistant Dr. Borislav Georgiev presents the following scientific-applied and applied contributions Newly formulated theories and hypotheses: development of mathematical models describing the dynamics of electrohydraulic systems and the dynamic error in measuring the angular orientation of moving objects.

New essential results within existing scientific fields: development of algorithms for adaptive estimation of the covariance matrix Q in angular orientation measurement systems, algorithms for parameter and state estimation in electrohydraulic systems, determination of measurement channel dispersions, adaptive real-time estimation of measurement error covariance matrix R , an adaptive mechanism for compensating systematic errors, an algebraic approach to calculating hydraulic motor acceleration within a Kalman filter structure, an adaptive procedure for updating covariance matrices based on parameter derivatives, introduction of identification coefficients, and an integrated methodological framework combining regression relations, derivatives, and smoothing procedures.

New classifications, methods, technologies: development of an integrated method for measuring angular orientation of moving objects and a metrological methodology for dynamic accuracy assessment.

Confirmatory results: experimental verification of the measurement system and simulation validation of the developed models and algorithms in MATLAB/Simulink.

Applied contributions: development of procedures and experimental demonstrations related to dynamic calibration of measurement systems, creation of experimental setups, and laboratory testing of real electrohydraulic systems demonstrating the applicability and reliability of the developed algorithms.

4. Evaluation of the Candidate’s Personal Contribution

I accept that the contributions are the personal work of Senior Assistant Dr. Borislav Georgiev, as evidenced by the results of his research, published in reputable scientific journals and presented at national and international scientific forums.

5. Critical Remarks and Recommendations

I have no critical remarks regarding the materials submitted by Senior Assistant Dr. Borislav Georgiev. My evaluation is positive.

6. Personal Impressions

I am familiar with the scientific and teaching activities of Senior Assistant Dr. Borislav Georgiev as a colleague at the Department of Mechanical Engineering and Instrumentation. I am well acquainted with his publication activity and the very positive reception of his work by the scientific community in the field of the competition.

7. Conclusion

Based on the review of the submitted scientific works, their significance, and the scientific, scientific-applied, and applied contributions contained therein, I propose to the esteemed scientific jury that Dr. Eng. Borislav Atanasov Georgiev be elected to the academic position of “Associate Professor” in the field of higher education “Technical Sciences”, professional field “Mechanical Engineering”, specialty “Electronic (analog and digital) measuring transducers and instruments”.

Gabrovo, 7 November 2025

Member of the Scientific Jury:

Prof. Iliya Zhelezarov