O P I N I O N

Authored by Prof. D.Sc. Dimitar Andonov Dichev of Technical University – Gabrovo (TUG) concerning materials submitted for participation in competition for awarding the academic position of "Associate professor" in Field of Higher Education - 5. Technical Sciences, Professional Field - 5.1. Machine Engineering, scientific major "Electronic (Analog and Digital) Measuring Transducers and Instruments"
Candidate: Chief assistant professor Borislav Atanasov Georgiev, PhD

1. Information about the competition

The competition for the academic position of Associate Professor at Technical University of Gabrovo was announced in the State Gazette, issue No. 48 of June 13, 2025, and on the official website of the University, for the needs of the Department of Mechanical and Precision Engineering, which is part of the Faculty of Mechanical and Precision Engineering.

2. Information about the candidate

Only one candidate is participating in the announced competition - Chief Assistant Professor Dr. Eng. Borislav Atanasov Georgiev, a full-time lecturer at the Department of Mechanical and Precision Engineering (MPE). The candidate has fully complied with the quantitative and qualitative requirements stipulated in the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), in the section "Conditions and Procedures for Occupying the Academic Position of Associate Professor."

Chief Assistant Professor Dr. Eng. Borislav Georgiev holds a Master's degree in Technical Sciences, specializing in Mechanical and Precision Engineering, and a PhD in Hydraulic and Pneumatic Actuating Systems, obtained after successfully defending a dissertation entitled "Investigation and Optimization of the Dynamics of an Electrohydraulic Servo System."

Dr. Georgiev began his academic and teaching career in 2018 at the Technical University of Gabrovo under a full-time employment contract. Prior to that, he worked as a Trade Organizer at Merkuriy Production and Packaging JSC - Gabrovo, Marketing Expert at Alfrida Peev Ltd. – Gabrovo, and Section Manager of TV, Audio and Electronics at Technomarket Europe. He has also worked at the cooperative Panda-Sofia – Gabrovo, where he was responsible for organizing the work process and staff training. At the beginning of his professional career, he was employed as a Ship Hull Repair Technician at Odessos Shiprepair Yard Ltd. - Varna. He is proficient in English and Russian. Dr. Georgiev participates in the competition with scientific works that do not duplicate the publications submitted for the acquisition of the educational and scientific degree "Doctor" and for the occupation of the academic position "Chief Assistant Professor."

3. Overview of the Content and Results of the Submitted Works

The scientific works submitted by the candidate for the competition can be classified into the following three main groups: habilitation work (monograph), scientific publications - articles in journals and papers presented at conferences, and a teaching manual. The analysis of the materials submitted by Dr. Georgiev shows that they meet and exceed, in quantitative terms, the corresponding minimum national requirements as defined in the Law for the Development of the Academic Staff in

the Republic of Bulgaria (LDASRB), its Implementing Regulations, and the Regulations of the Technical University of Gabrovo.

The habilitation work presents a comprehensive study on the application of adaptive methods for controlling the dynamics of electrohydraulic systems. The monograph, entitled "Adaptive Methods for Control of the Dynamics of Electrohydraulic Systems," begins with an extensive review of the development, structure, and application areas of electrohydraulic drives, emphasizing their advantages, limitations, and current trends toward energy efficiency and intelligent control. The author analyzes the main nonlinearities, external influences, and structural characteristics affecting the stability and accuracy of such systems, and proposes approaches for their compensation through adaptive and intelligent algorithms.

Special attention is given to the principles and algorithms of adaptive control, including recursive identification, Kalman filters, and hybrid models, which enable the dynamic adjustment of system parameters in real time. The monograph also examines the possibilities for integrating these methods into frequency-controlled electrohydraulic systems and evaluates their impact on stability, accuracy, and energy efficiency. Examples and comparative analyses are presented, demonstrating the practical applicability of the proposed solutions in industrial, robotic, and measurement systems.

The candidate for the position of Associate Professor has a substantial number of scientific publications, comprising 21 papers, which reflects his active and consistent engagement in research activities. His works have been published both in Bulgaria and abroad, with 11 of them indexed in prestigious databases such as Scopus and/or Web of Science. It is noteworthy that three of these articles are published in journals with an Impact Factor (IF) and/or a Scimago Journal Rank (SJR). These facts attest to the high quality and scientific value of his research. Dr. Eng. Georgiev's publications focus on the study and improvement of control and measurement methods in electrohydraulic and mechatronic systems. The main emphasis lies on the development of mathematical models of dynamic processes, the analysis of factors influencing accuracy, and the application of advanced algorithms such as the Kalman filter and the least squares method for adaptive parameter estimation. Several of his works address systems for measuring the angular orientation of moving objects, analyzing the errors in roll and pitch determination and proposing methods for their compensation. A significant part of his research is dedicated to the optimization and adaptive control of electrohydraulic drives, aimed at improving stability, energy efficiency, and metrological accuracy. His studies follow the complete research cycle - from modeling and simulation to experimental verification of the results.

The candidate for the position of Associate Professor takes an active part in research projects and joint publications, making a significant contribution to their implementation. In a considerable number of his works, he appears as the second or third author, which indicates his substantial involvement in experimental work, data analysis, and the execution of applied research tasks. At the same time, Dr. Georgiev has also demonstrated established leadership in research – in ten of his publications, he is the first author, which highlights his ability to formulate scientific ideas and lead their practical implementation.

I recommend that in his future work, Dr. Georgiev continues to expand his scientific activity by focusing on publications with leading authorship and international scope. This would contribute to a clearer distinction of his individual contribution and to the further strengthening of his scientific profile.

The teaching manual "Laboratory Exercises in Elements of Automation" is intended for students majoring in Mechatronics and covers both the theoretical foundations and practical aspects of the discipline. It includes laboratory exercises designed to facilitate the understanding of the operating principles, structure, and classification of Programmable Logic Controllers (PLCs). The

manual provides a smooth transition from the fundamental theoretical concepts to the practical implementation of control and automation tasks, thereby establishing a link between academic training and real engineering applications. The content is clearly structured, with good methodological consistency and high practical value for students' learning.

4. Impact of the Candidate's Scientific Publications on the Research Community

According to the reference provided by the candidate at the time of submission, Dr. Georgiev's publications have gained recognition within the international scientific community. As confirmation of this, it should be noted that out of a total of 19 citations of his publications, 11 are indexed in the internationally recognized databases Web of Science and Scopus, which demonstrates a favorable reception of his research results. Considering the thematic scope and the quality of his scientific work, an increase in citation rate can be reasonably expected, particularly with more active publishing in journals with international visibility.

5. General Characteristics of the Candidate's Professional Activity

5.1. Teaching and pedagogical activity

Chief Assistant Professor B. Georgiev is an established university lecturer. He began his teaching career in 2018 and has successfully progressed through all stages of his academic development, which logically and fully deservedly should continue with the awarding of the academic position of Associate Professor. In support of this statement, it should be noted that the Department of Mechanical and Precision Engineering at the Technical University of Gabrovo has highly evaluated his teaching competencies and entrusted him with delivering lecture courses in six disciplines at both the Bachelor's and Master's degree levels. It is beyond doubt that the depth, innovation, and competence demonstrated in his scientific works are clearly reflected in his teaching activity.

5.2. Scientific and Applied Research Activity

Dr. Eng. Borislav Georgiev demonstrates significant scientific and applied research achievements in the fields of measuring transducers and instruments, mechatronic systems, and electrohydraulic drives. His research focuses on the development and implementation of adaptive methods for control and parameter estimation in dynamic measurement systems, employing algorithms based on the Kalman filter and the least squares method. The obtained results have direct applications in the analysis of accuracy and stability of electrohydraulic systems, as well as in the improvement of measuring instruments used for determining the angular orientation and dynamic characteristics of moving objects.

His scientific and applied research activity includes participation in seven international, national, and university projects related to the development of intelligent measurement systems and adaptive control algorithms. Within these projects, Dr. Georgiev has contributed to the modeling, simulation analysis, and experimental verification of the proposed methods and technical solutions. Some of the results have been achieved in collaboration with leading research teams and presented at international conferences and peer-reviewed journals.

The scientific and applied research activity of the candidate is characterized by a clear focus on improving the accuracy and reliability of measurement systems, fully consistent with the thematic scope of the specialty "Electronic Measuring Transducers and Instruments."

5.3. Implementation Activity

Although no specific evidence of implementation activity has been presented, many of Dr. Georgiev's scientific developments have a direct practical orientation and potential for implementation in industrial and laboratory control and measurement systems.

6. Contributions. Significance of contributions for science and practice

The contributions presented in the author's reference are clearly formulated and properly structured in accordance with the commonly accepted methodological categories. They are well-justified and consistently argued, encompassing both scientific-applied and purely applied results.

The scientific-applied contributions reflect the development of new models, algorithms, and methodologies for adaptive estimation and control of dynamic processes in electrohydraulic and measurement systems. The applied contributions have a distinct engineering focus and are related to experimental implementations, metrological verification, and the development of calibration methodologies for angular orientation measurement systems.

The formulated contributions are methodologically sound, logically substantiated, and hold significance both for the advancement of scientific research in the field and for practical applications in modern measurement technologies.

7. Evaluation of candidate's personal contribution

In my opinion, the personal contribution of Dr. Borislav Georgiev to the results achieved through his teaching, scientific, and applied research activities is undeniable and significant. The presence of a substantial group of co-authors attests to the scope and importance of the researched topics, as well as to his ability to work effectively in a team on key scientific issues. It should be emphatically noted that the substantial scientific results, practical applications, and citations obtained are largely due to Dr. Georgiev's personal efforts, ideas, expertise, and organizational abilities.

8. Critical remarks and recommendations

The above-mentioned merits of the materials submitted by the candidate clearly dominate my entirely positive assessment. The scientific works are distinguished by a clear concept, logical consistency, and convincingly argued results, which testify to the high professionalism and maturity demonstrated by Dr. Eng. Georgiev in his research activity.

The scientific and teaching experience accumulated by the candidate provides an excellent foundation for the development of textbooks and methodological materials in the field of electronic measuring transducers, sensors, and measurement systems. It is recommended that Dr. Georgiev continue to share his experience with young researchers and doctoral students, encouraging them to engage in active scientific and experimental work.

In addition, it would be beneficial for Dr. Georgiev to further develop his research by expanding the experimental base and deepening the connection between theoretical models and experimental results. Maintaining an active publication record in international journals with a high impact factor (IF) would further contribute to the strengthening of his scientific reputation and recognition within the research community.

9. Personal impressions

I have known Dr. Georgiev since he joined the department and have extremely positive impressions of his professional and personal qualities. He demonstrates a high level of responsibility, collegiality, and commitment to professional development, both in his teaching and research activities. He is distinguished by his integrity, consistency, and readiness for collaboration.

10. Conclusion

In view of the above, **I propose to the esteemed Academic Jury that Chief Assistant Professor Borislav Atanasov Georgiev, PhD, be awarded the academic position of "Associate Professor"** in:

higher education area - 5. Technical sciences,
professional field - 5.1. Machine Engineering,

scientific major - Electronic (Analog and Digital) Measuring Transducers and Instruments

22.10.2025 г.

Prepared the opinion:
/Prof. Dimitar Dichev, D.Sc./