



## REVIEW

by **Academician Vassil Sgurev**

from the Bulgarian Academy of Sciences,

on the Competition for the academic position "**Associate Professor**",

under the Scientific Field 5. Technical sciences,

the Professional Area 5.1. Mechanical Engineering,

for the needs of the Robotic and Mechatronic Intelligent Systems Department

of the Institute of Robotics "Saint Apostle and Gospeller Mathew",

at the Bulgarian Academy of Sciences,

announced in Darjaven Vestnik No. 39 of 13.05.2025

with a participant – **Assist. Prof. Veronica Ivanova Atanasova-Georgieva, PhD**

In accordance with Order No. 75 from 16.07.2025 of the Director of the Institute of Robotics at the Bulgarian Academy of Sciences, I have been appointed as a member of the Scientific Jury of the competition for occupation of the academic position "Associate Professor" in the Scientific Field 5. Technical sciences, the Professional Area 5.1. Mechanical Engineering, Scientific Specialty "Elements and devices of automation and computing" ("Robotic devices with application in medicine"), for the needs of the Robotic and Mechatronic Intelligent Systems Department of the Institute of Robotics "Saint Apostle and Gospeller Mathew", at the Bulgarian Academy of Sciences, announced in Darjaven Vestnik No. 39 of 13.05.2025, with the sole participant in the competition - Assistant Professor Veronica Ivanova Atanasova-Georgieva, PhD.

## **I. General information about the applicant**

Veronika Ivanova Atanasova-Georgieva was born on July 28, 1975 in Sofia. She obtained her Master's degree in 2000, majoring in Industrial Management and specialization in Industrial Engineering, from the Faculty of Economics of the Technical University of Sofia. In 2020, she was awarded the PhD degree after defending her PhD thesis on the topic "Laparoscopic Executive Instruments for Robots" from the Institute of Robotics at the Bulgarian Academy of Sciences.

Her scientific career began in 2004, as a researcher at the Central Laboratory of Mechatronics and Instrumentation at the Bulgarian Academy of Sciences. During the period 2011-2017, she held the academic position of "Assistant Professor" at the Institute of Systems Engineering and Robotics, and since 2017, she has held the same academic position at the Institute of Robotics at the Bulgarian Academy of Sciences.

## **II. General characteristics of the submitted documents and works**

As a member of the Scientific Jury I have received the following documents:

1. Order No. 75 of 16.07.2025 of the Director of the Institute of Robotics at the Bulgarian Academy of Sciences.
2. Application for participation in the competition from Assistant Professor Veronika Ivanova Atanasova-Georgieva.
3. European Curriculum Vitae.
4. Copy of the diploma for the acquired PhD degree.
5. List of scientific publications that do not repeat those submitted for the acquisition of the PhD degree.
6. List of inventions and other scientific and applied results.
7. List of noted citations.
8. Summaries of scientific publications - in Bulgarian and English.
9. Copies of all scientific publications for participation in the competition.



10. Certificate of fulfillment of the minimum national requirements for occupying the academic position "Associate Professor" by groups of indicators according to the Law on the State of the Republic of Bulgaria 2b, para.2 and 3 for the scientific field.

11. Reference to the original scientific and applied scientific contributions of the candidate.

12. Declaration that I have no proven plagiarism in the scientific works submitted for participation in the competition in accordance with the statutory procedure.

13. Declaration (Appendix 1) and Declaration (Appendix 2), completed by the candidate according to the requirements of the Internal Rules for the Development of the Academic Staff of the IR-BAS.

14. Document for payment of the IR-BAS fee by bank transfer.

15. Other evidentiary materials and documents for the competition.

In accordance with the requirements of the Development of Academic Staff Act in the Republic of Bulgaria and the specific requirements in the Act's Institutional Regulation, the candidates for occupying the academic position of "Associate Professor" must meet the following conditions, regulated in Art. 24. (1):

1. Have acquired an educational and scientific PhD degree;

2. Have held for at least two years the academic position of Assistant Professor;

3. Have submitted published monographs or equivalent publications in specialized scientific publications that do not repeat the ones submitted for the PhD degree;

4. To comply with the minimum national requirements under Art. 2b, # 2 and # 3, respectively, of the requirements of art. 2b, # 5;

5. Not to have plagiarism in the scientific publications proven by the legislation order.

### **III. General characteristics of the applicant's scientific and applied activities**

The candidate works in a very promising and current scientific field, which is a guarantee for achieving good results, with guaranteed publicity among the world scientific community. According to the submitted references, Assistant Professor Veronika Ivanova Atanasova-Georgieva participated in the competition with eleven publications, referenced and indexed in the world databases Scopus and/or WoS, which are presented as equivalent to the monographic work on the topic "Robotic devices with application in medicine", with one utility model "System for analysis and control of the mechanical properties of biological tissues with application in laparoscopic operations", one book based on a PhD thesis, six publications referenced and indexed in world-renowned databases with scientific information and sixteen publications in non-refereed journals with scientific review or in edited collective volumes.

The publications submitted were not used in the procedures for obtaining the PhD degree and the scientific position of "Assistant Professor".

The works presented to the candidate in the competition are original and I do not know the presence of plagiarism.

The results obtained in the publications presented for the competition are entirely in the field of the competition.

I accept the author's reference for the contributions in the works with which Assistant Professor Veronika Ivanova Atanasova-Georgieva participated in the competition, the results being scientific, scientifically applied and applied.

Scientific and applied contributions can be systematized by:

1. A system for analyzing and controlling the mechanical properties of biological tissues has been developed for application in laparoscopic surgeries, introducing the parameter "relaxation time", characterizing the internal structure of the tissue (its elasticity and viscosity).



2. An architecture of a multifunctional operator control station based on the low-level programming language Tcl/Tk is proposed, consisting of: a communication block, an interface block, a block for additional signal processing, a block for training and simulations, a database, a block with a knowledge base and a graphical interface with video signal capabilities.

3. A mobile application for virtual and augmented reality has been developed as an upgrade to the proposed operator station with application in minimally invasive surgery, for the purposes of training medical students.

4. A model-based approach has been developed for designing the architecture of a software system based on the multifunctional operator process control station.

5. The technological components, hardware implementation and software solution of a multifunctional platform for training in minimally invasive surgery are proposed.

6. A solution has been proposed for ECG monitoring of patients, to which an application has been added for victims of disasters and accidents.

7. A system for collecting data in healthcare is proposed with the introduction of an electronic chip card carrying information about the patient's condition.

8. An algorithm for designing laparoscopic robotic performing instruments has been developed.

9. A device for surgical robots in local tumor therapy has been developed, consisting of a diagnostic device, which is upgraded with a UHF generator that generates a programmed frequency, forms the necessary radio signal and feeds it to an emitter for conducting radiotherapy.

The citation report presented by Assistant Professor Veronika Ivanova Atanasova-Georgieva shows a number of 24 citations. I agree that this number is at the time of submission of the competition documents and no new citations have been included.

According to submitted references, Assistant Professor Veronika Ivanova Atanasova-Georgieva was a member of the team of international and national research projects.

Assistant Professor Veronika Ivanova Atanasova-Georgieva is the winner of the "Award for original scientific work of a young scientist" from the Exhibition "Ikuo Hirayama's Silk Road - Crossroads of Cultures in a Promise of Peace", which took place in Sofia on November 10, 2011 and was an invited lecturer at the Technical University - Sofia.

According to the information presented by Assistant Professor Veronika Ivanova Atanasova-Georgieva, for meeting the minimum requirements of the Development of Academic Staff Act in the Republic of Bulgaria and of the Institute of Robotics at the Bulgarian Academy of Sciences, she fulfills the minimum requirements for indicators A, C, D, E and F in the Scientific Field 5. Technical Sciences, the Professional Area 5.1 Mechanical Engineering.

#### **IV. Notes and recommendations**

Based on the materials submitted for review for the competition by Assistant Professor Veronika Ivanova Atanasova-Georgieva, the following notes and recommendations can be made:

1. The candidate for the competition should focus her attention on more modern methods - including methods from the arsenal of artificial intelligence.
2. It would be good if the proposed and used formal methods were also evaluated from the point of view of their computational complexity.

#### **V. Personal impressions of the candidate**

I know the candidate for this competition, Assistant Professor Veronika Ivanova Atanasova-Georgieva, and I believe that she is a well-rounded researcher with the necessary knowledge and skills.



## VI. Conclusion

In conclusion, I agree that the requirements of the Law for the Development of Academic Staff Act in the Republic of Bulgaria and the specific requirements in the Act's Institutional Regulations for its implementation, the Rules for the conditions and the order for acquiring academic degrees and for the occupation of academic positions in the Bulgarian Academy of Sciences, and the Rules for the specific conditions for acquisition of academic degrees and occupation of academic positions in the Institute of Robotics at the Bulgarian Academy of Sciences are accomplished. After getting acquainted with the materials submitted by the applicant for the competition, I give my positive estimation about the choice of Assistant Professor Veronika Ivanova Atanasova-Georgieva in the competition for the academic position of "Associate Professor" for the needs of the Robotic and Mechatronic Intelligent Systems Department of the Institute of Robotics at the Bulgarian Academy of Sciences, in the Scientific Field 5. Technical sciences, the Professional Area 5.1. Mechanical Engineering, Scientific Specialty "Elements and devices of automation and computing".

I propose that the Scientific Jury unanimously vote for a proposal to the Scientific Council of the Institute of Robotics at the Bulgarian Academy of Sciences, to elect Assistant Professor Veronika Ivanova Atanasova-Georgieva for the academic position of "Associate Professor" in the Scientific Field 5. Technical sciences, the Professional Area 5.1. Mechanical Engineering, Scientific Specialty "Elements and devices of automation and computing" ("Robotic devices with application in medicine").

15.08.2025

Sofia

Signature: . . . . .

/~~acad.~~ Vassil Sgurev/