REVIEW

on a competition for the academic position of "Associate Professor" in the field of higher education 5. Technical Sciences, professional field 5.1. "Mechanical Engineering", scientific specialty "Robots and Manipulators" (Applications of Service Robotics and Control Systems with Elements of Artificial Intelligence), announced in the "State Gazette", issue 61 of 29.07.2025, p. 214 - for the needs of the "RiMIS" laboratory.

candidate: Georgi Tsvetanov Angelov, M.Sc. Dr.

Reviewer: Prof. Dr. Eng. Nikola Vichev Kolev, Doctor of Sciences, member of the jury, in accordance with Order No. 81/30.09.2025 of the Director of the Institute of Robotics at the Bulgarian Academy of Sciences.

1. General information and biographical data

The candidate for the competition, Dr. Georgi Angelov, was born in 1977 and graduated from a master's degree in engineering physics at the Faculty of Physics of Sofia University "Kliment Ohridski". He worked from 2001 to 2017 as a manager of private companies (DND2000 EOOD, Pixay and Robotik) with a field of activity in engineering and information technologies, and then as an assistant and chief assistant at the Institute of Robotics at the Bulgarian Academy of Sciences.

In 2018, Dr. Eng. Angelov defended his dissertation on the topic "Research, modeling and implementation of software systems for control and communication of service mobile robots in the TCP/IP network environment" and received the educational and scientific degree "doctor".

Since 2019, Dr. Angelov has been the head of the National Laboratory of Robotics and Artificial Intelligence at the Institute of Robotics. His total work experience in the specialty is 24 years, having qualified in: robotics and mechatronics, as well as engineering physics.

He has participated in 13 innovation projects - 3 international and 3 national scientific projects under the Bulgarian National Science Foundation, participation in 2 National Centers of Competence.

The remaining 5 projects that implement innovations are in private companies, of which Dr. Angelov is the manager. All projects implemented and managed by him are for the needs of management in practice.

In 2008, he and the team led by him received a gold medal from the International Technical Fair in Plovdiv for a series of megapixel IP cameras for video surveillance.

Dr. Angelov is the only candidate and submitted his documents for the competition within the legal deadline.

2. General description of the submitted materials

The candidate in the competition for the academic position of "associate professor" Dr. Angelov has submitted the following materials: an application to the Director of the Institute; a CV; copies of a diploma for the educational and scientific degree of "doctor", a monographic work in English "Modern Applied Service Robotics" - published in 2025, a list of 10 systematized scientific publications in publications that are referenced and indexed in world-renowned databases, as well as 14 - published in non-refereed journals with scientific review, lists of scientific works;

separate copies of scientific publications for participation in the competition; author's reference for citations of his works; author's reference for scientific and scientific-applied contributions; reference for participation in scientific and educational projects; a certificate of compliance of the candidate's materials with the minimum requirements for candidates for the academic position of "associate professor", according to the Appendix from the BAS PURZAD.

3. **General characteristics of the candidate's research and applied scientific activity**

The candidate in the competition Georgi Angelov has worked in the field of engineering and robotics throughout his working life. He has submitted for review 24 scientific papers outside the publications on the dissertation and one monograph, published in 2025.

He has submitted 10 publications, referenced in the world's evaluation systems, on the topic "Developments in service robotics and in control systems with elements of artificial intelligence (Robotized systems for health training and biometries)". The achieved results and scientific contributions in these publications, as a participant and leader of scientific projects, are the result of Dr. Angelov's work in the research projects implemented at the Institute of Robotics with the active participation of the candidate in the competition. The development and application of robotic technologies in medicine and biology determine their increasingly widespread application. These technologies play a key role in the improvement of robots for medical purposes, in helping people with various mobility limitations.

Improving accuracy and functionality is essential for increasing the efficiency of robotic systems and is an element of the research activity of the candidate in the competition. In each of the ten articles by Dr. Angelov, various tasks are solved for the application of service robotics in education, the use of green hydrogen power supply technologies in mobile service robots - operating in field conditions and in remote locations without mains power supply, for the creation of a collaborative service robot powered by a hydrogen fuel cell, robots in healthcare and in serving people with disabilities.

In other of his publications, the provision of digital accessibility for training students - their various needs - sensory support, knowledge search through the use of robots, etc. such. In his other publications, there are solutions for ensuring autonomous operation of mobile service robots with battery power, robots to assist people with disabilities and when using technologies in special education.

A place is allocated in the publications for assessing the ability to transport substances through biological membranes and for assessing changes in their transport capabilities by creating model lipid membranes on a glass-carbon electrode (GC) and studying their impedance.

The method of spectro-impedance assessment finds application in immunology and medicine, for creating fast and precise bio-sensors. One of the examples of such a specialized application is the created educational service robots BEBOT and MAXIBOT in the field of STEM education and social pedagogy, as well as in the automated computer-controlled electrochemical impedance spectrometer with

application in the study of bilayer phospholipid membranes (Publications: D.7.9; D.7.10).

The created robots have a modular architecture and open access, which makes them flexible in configuration and with the possibility of upgrading and adapting. This achieves a significant increase in the accuracy and quality of the data necessary for the functioning of the robots, which is essential for the reliable operation of service robotic systems in their various applications (Monography; Publications G7.4; G7.8; G8.12).

Other innovations in which Dr. Angelov is a participant are related to the creation of a transport and logistics robot "Spartak" with a main mission to optimize systems in logistics by organizing reliable movement of goods (Publications: G7.3; G8.5).

Thus, Dr. Georgi Angelov has fulfilled the requirement of Art.29(1), item 3 of the Regulations, by presenting 1 monograph and 10 internationally refereed publications, indexed in the global Scopus and WoS evaluation systems.

Separately, the candidate has presented a list of 14 publications in non-refereed journals with scientific review, which are in the field of applications of service robotics, in the field of education and healthcare.

A number of the articles are aimed at effective user interfaces necessary for people and for their medical care, such as voice-controlled interfaces with application in medical institutions, etc.

Dr. Angelov pays serious attention to the creation of service robots for security and for maintaining security in the working environment, as well as the security of service robots for medical purposes (Publications: D.8.3, 4 and the Monograph).

In the management of the energy systems of mobile service robots, the main place is given to the efficiency, functionality, reliability and duration of work, which parameters are pursued by the creators of this type of robots (Publications: G 8.4,5, 6, 7, 8).

Dr. Angelov has made efforts to co-author collaborative service robots for educational purposes with the ability to help people in disadvantaged situations with requirements for high ethics and assistance of social workers and psychologists (Publications: G.8. 9,10,11,12, 13 and 14).

Dr. Angelov's scientific works have been published in journals: "Compte Rendus de l' Academie Bulgare des sciences", in the scientific publications of international conferences "Proceedings of the IEEE", "Electronics", etc.

The list of citations under the procedure includes 7 citations of the candidate's publications by scientists from the country and abroad.

The complex nature of the developments with which the candidate participated in the competition required him to work in a team and therefore his works are mainly collective (one publication is independent and in five he is the first author).

The scientometric report on the candidate's activities in the competition shows that with a minimum requirement of 400 points for an associate professor in the Institute of Robotics of the Bulgarian Academy of Sciences, Dr. Angelov has exceeded the required minimum points for all positions (a total of 455 points).

The review of the candidate's documents shows that the procedural and legal requirements arising from the Law on the Administration of Robotics and the Administration of Robotics (Art. 29, para. 1), the Regulations thereto (Art. 60) and the Regulations on the

terms and conditions for holding academic positions at the Institute of Robotics of the Bulgarian Academy of Sciences have been complied with.

4. Main scientific and applied scientific contributions

I will present the candidate's contributions to the competition, which are of a scientific and applied scientific nature, in a systematized manner. All 10 scientific papers are in scientific journals with an impact factor or Scopus, referenced and indexed in the global evaluation system.

Scientific contributions

1. A model was created and a practical software system for controlling service robots for training was implemented. A model was implemented and a software system for controlling service robots was created, specially developed for the needs of the educational process. A methodology is proposed for building a software framework in which students can directly train without the need for additional applied software (Publications: G7.5, G7.7, Monograph);

2. A model was created and a practical user interface for controlling service robots for training was implemented. A practical user interface for controlling service robots with an integrated web-based programming editor has been developed, which is tailored to the specific requirements of the educational process with the ability to easily switch between different operating modes, which allows programming basic and advanced functionalities of robotic systems in a web environment (Publications: G7.5, G7.7, G8.2, G8.12, Monograph)

Scientific and applied: contributions:

1.Cyber-physical systems for educational purposes have been created: Software components for a cyber-physical system including service robots for teachers and students in a network environment have been created, which is of particular importance because it introduces new models of learning - remote, interactive and based on real robots (Publications: G7.4, G7.5, G8.1, G8.9, G8.10, G8.14, Monograph);

2.A model of a charging system for the production and storage of green hydrogen has been created and ecological energy-sustainable systems in robotics have been developed. These systems are applicable to powering service robots, which solutions are aimed at sustainable energy provision through the use of green hydrogen as an energy carrier. The opportunity is created for robots to be ecological, autonomous and to function for a long time without the need for frequent recharging. (Publications: G7.1, G7.2, G7.8, G8.4, G8.13);

3.Interfaces for service robots with elements of artificial intelligence have been developed. A methodology for a user interface with voice control, which uses elements of artificial intelligence, has been created and tested, and a demonstration interface has been implemented based on the created methodology (Publications: G8.2, G8.3);

4.Participation in the creation of a new educational specialty in robotics Dr. Eng. G. Angelov in a team is among the initiators and implementers of the state educational standard (SES), curriculum, syllabus and examination program for the first specialty in Bulgaria "Robot Programmer". (Publications: Angelov, G., "Modern Applied Service Robotics" (Monograph, Robotic Publishing, 2025; Curriculum and syllabuses "Robot Programmer"), including examination program in the Ministry of Education and Science).

5. Significance of contributions to science and practice

The significance of the created models, devices and robotic systems is undeniable, because completed technical developments are offered, some of which have been implemented in practice and in social life in the implementation of scientific projects and contracts.

The works of the candidate in the competition are prepared qualitatively, with an extensive literary justification, analytical part and conclusion.

6. Critical notes and recommendations

1. The author's reference for the contributions with the publications is verbose.

7. Personal impressions and opinion of the reviewer

I do not know Dr. Angelov, but from the publications and the monograph I was impressed by the in-depth knowledge of the processes that he has studied to prove his theses.

I positively evaluate the results of the candidate's developments, included in the scientific publications and the monograph with which the candidate participates in the competition, as well as the knowledge and experience gained at the Institute of Robotics at the Bulgarian Academy of Sciences. I note that the candidate in the competition has no proven plagiarism in scientific works (Art. 24. para. 5 of the Law on the Protection of Scientific and Technological Development of the Republic of Bulgaria).

I have no joint publications with Dr. Angelov and am not a person related to him within the meaning of paragraph 1, item 5 of the Additional Provisions of the Law on the Protection of Scientific and Technological Development of the Republic of Bulgaria.

8. CONCLUSION

Based on the familiarization with the materials presented by the candidate in the competition (biography, scientific works, participation in projects and contracts, their significance, the scientific and scientific-applied contributions contained in them), I find it reasonable to propose to the Scientific Jury to make a positive decision on the election of Dr. Georgi Tsvetanov Angelov as "Associate Professor", and to propose to the Scientific Council of the Institute of Robotics that he be elected to occupy the academic position of "Associate Professor" in professional field 5.1. Mechanical Engineering (Applications of Service Robotics and Control Systems with Elements of Artificial Intelligence) in the "RiMIS" section, NLRII laboratory of the Institute of Robotics at the Bulgarian Academy of Sciences.

Sofia Reviewer:
20.10.2025.

Prof. Dr. Eng. Nikola V. Kolev, D.Sc.