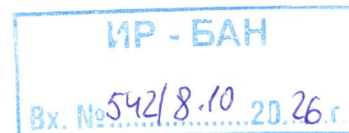


OPINION



for a competition for the academic position of "Professor"
professional field 5.1. Mechanical Engineering
specialty "Robots and manipulators"
published in the State Gazette № 51 /05.06.2026

Candidate: Assoc. Prof. PhD Eng. Nina Foteva Valchkova
Institute of Robotics BAS

Scientific Jury member: Prof. PhD Eng. Stiliyan Nikolov Nikolov
department ADPE at MEF of TU-Sofia

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

The candidate Assoc. Prof. PhD Eng. Nina Valchkova submitted a set of documents for participation in the competition, consisting of: habilitation thesis (monograph), 7 articles referenced and indexed in world-famous databases (Scopus); 10 publications in non-refereed peer-reviewed journals and additional materials related to his professional activity. All presented materials are in the field of the subject of the competition "Robots and manipulators".

Assoc. Prof. PhD Eng. Nina Valchkova has submitted a reference regarding fulfillment of the minimum requirements for the occupation of the academic position "Professor" in professional field 5.1. Mechanical engineering, defined in Law on the Development of the Academic Staff in the Republic of Bulgaria (ЗЗЗЗЗЗЗЗ), Rules for Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria (ПЗЗЗЗЗЗЗ), Rules of the Bulgarian Academy of Sciences (BAS) on the Conditions and Procedure for Acquiring Scientific Degrees and Holding Academic Positions and internal rules of Institute of Robotics (IR-BAS) regarding the development of the academic staff.

My assessment of the presented materials is:

Indicator A (50 / 50 points) - A diploma for ESD "Doctor" from IR-BAS №000281/09.10.2013 is presented. The candidate meets the minimum requirements for **indicator A**.

Indicator B (100 / 100 points) - A monograph is presented on the topic: "Metrology of Mobile Robots in Healthcare: Methods, Models, Evaluation, and Optimization of Mobile Collaborative Service Robots", published in 2026, by Prof. Marin Drinov Publishing House of the BAS Sofia with ISBN 978-619-245-613-9 The candidate fulfills the minimum requirements for **indicator B**.

Indicator Г (220,33 / 200 points) - Presented: 7 scientific publications, referenced and indexed in world-renowned scientific information databases (Scopus), 5 of them are with SJR; 10 publications in non-refereed peer-reviewed journals. All publications are in the field of the competition, in three of them the candidate is the only author. The candidate exceeds the minimum requirements for **indicator Г**.

Indicator Д (151 /100 points) - Twelve citations of the candidate's works in scientific publications, referenced and indexed in world-famous scientific information databases 8 citations in peer-reviewed monographs and edited volumes, and 21 citations in peer-reviewed, non-refereed journals are presented. I don't accept the following citations:

- 14 of the citations in the doctoral dissertation titled "Increasing the cognitive abilities of robots by optimizing their sensory system" by Vasil Georgiev Tsvetkov.
- citation in Ingrid Maritza Vedayana Tzunun Cifuentes , DISEÑO DE LA INVESTIGACIÓN OPTIMIZACIÓN DE LA GESTIÓN DE INVENTARIO DE INSUMOS DEPORTIVOS EN LA ASOCIACIÓN DEPARTAMENTAL DE NATACIÓN DE CHIMALTENANGO PARA

REDUCIR PÉRDIDAS DE EQUIPO, UNIVERSIDAD DE SAN CARLOS DE GUATEMALA - FACULTAD DE INGENIERÍA, GUATEMALA, JULIO DE 2025; <https://biblio.ingenieria.usac.edu.gt/protocolos/2025/TGP1878.pdf>

- citation in SATHIYA A., P VADIVELU, INDUSTRY 4.0 TECHNOLOGIES AND SUPPLY CHAIN RESILIENCE: INSIGHTS FROM LOGISTICS AND SUPPLY CHAIN PERSPECTIVES IN PENANG, Thesis Submitted to School Of Technology Management & Logistics Universiti Utara Malaysia, in Fulfillment of the Requirement for the Master of Science (Supply Chain), https://etd.uum.edu.my/11847/2/s831443_01.pdf;
- citation in Putnam, Rachael M. "Multi-Objective Generation of Pareto-Optimal Perception Architectures for Autonomous Robotic Systems." PhD diss., Massachusetts Institute of Technology, 2025;

Consequently, in my assessment, the points for this criterion total 151, rather than the 183 claimed by the candidate. Nevertheless, the candidate exceeds the minimum requirements for **indicator Д**.

Indicator E (234,53 / 150 points) – References are provided regarding leadership of and participation in international and national scientific or educational projects, as well as funding secured for projects led by the candidate. The candidate exceeds the minimum requirements for **indicator E**.

The submitted reference by groups of indicators A, B, Г, Д and E, as well as the materials to it, show that the candidate fulfills the minimum requirements of the 3PACPE.

2. Assessment of the candidate's pedagogical training and activity

The candidate, Assoc. Prof. Dr. Eng. Nina Valchkova, has supervised one doctoral student who has successfully defended their thesis. The topic of the defended dissertation falls within the scope of the announced competition.

3. Basic scientific and applied scientific contributions

The applicant has provided an author reference for the contributions, declaring "scientific", "scientific-applied" and "applied" contributions. All entries are in the field of the competition and in particular in the field of:

- *Proving with new means essential new aspects of already existing scientific fields, problems, theories, hypotheses*

The following have been developed: an original scientific concept and methodology for the systems design of autonomous mobile collaborative robots; scientific foundations for designing high-mobility robots for operation in unstructured and high-risk environments; and scientific models for the intelligent control of autonomous mobile robot energy subsystems.

- *Creation of new classifications, methods, constructions, technologies*

The following have been developed: mathematical models for determining and optimizing the geometric, kinematic, mass-inertia, and energy parameters of mobile platforms; original models for multi-sensor perception and information fusion in mobile robotic systems; and the scientific foundations for the metrological assurance, experimental verification, and digital modeling of mobile robotic systems.

- *Obtaining confirmatory facts*

The following have been developed: scientific models for autonomous medical robotic systems and intelligent field medical stations; original models and algorithms for the intelligent control of autonomous mobile collaborative robots; and digital models and virtual experimental environments for robotic systems.

The contributions are formulated on the basis of the applicant's independent work and his participation in collectives working on scientific research projects, according to the presented reference. They faithfully reflect what was achieved in the presented scientific publications for the competition.

4. Significance of contributions to science and practice

The scientific, scientific-applied and applied contributions contained in the candidate's works are essential for the development and enrichment of scientific research in the field of robotics. Some of the candidate's contributions are implemented in practice.

The presented citations of the candidate's publications show that they have received the necessary recognition at home and abroad.

I believe that the volume and quality of the candidate's scientific research and scientific-applied activity Assoc. Prof. Dr. Eng. Nina Valchkova fully meets the requirements of the 3PACPB and the regulation for its application.

The quantitative indicators of Rules of the BAS on the Conditions and Procedure for Acquiring Scientific Degrees and Holding Academic Positions and internal rules of IR-BAS regarding the development of the academic staff for occupying the academic position "professor" have been fulfilled.

5. Critical notes and recommendations

I don't have significant critical remarks to dispute the main scientific, scientific-applied and applied contributions of the candidate.

I believe that the 27 scientific, scientific-applied, and applied contributions claimed by the candidate could be further refined and summarized.

I recommend that the candidate publish the results of their research activities in journals ranked in the Q1 or Q2 quartiles.

CONCLUSION

In my opinion, all necessary documents and references have been submitted. All requirements for occupying the academic position "Professor" in professional field 5.1 Mechanical engineering, defined in 3PACPB, ППЗРАС have been met.

The scientific developments of the candidate are at a very good level and are dedicated to a current topic that fully corresponds to the field of the competition.

In the scientific works presented by the candidate, sufficient scientific, scientific-applied and applied contributions have been realized.

Based on my familiarity with the presented scientific works, their significance, the scientific, scientific-applied and applied contributions contained in them, I find it reasonable to propose Assoc. Prof. PhD Eng. Nina Foteva Valchkova` to take the academic position of "Professor" in professional field 5.1. "Mechanical Engineering", specialty "Robots and manipulators", at the Institute of Robotics - BAS.

Date: 05.10.2026
Sofia

MEMBER OF THE JURY:

/Prof. PhD Eng. Stiliyan Nikolov/