

OPINION

by Prof. Desislava Ivanova Paneva-Marinova, PhD

Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences

for the competition for the academic position of “Professor”

in the field of higher education 4. Natural Sciences, Mathematics and Informatics,
professional field 4.6 Informatics and Computer Science, scientific specialty “Informatics” (Cognitive
Models and Artificial Intelligence for Multimodal Data)

at the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences

1. General overview of the procedure and the materials

The competition for the academic position of “Professor” was announced in the State Gazette, No. 54 of 12.06.2026, and on the website of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences. Documents for the competition were submitted by **a single candidate**: Assoc. Prof. Alexander Iliev Iliev, PhD of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences.

By Order No. 78 of 10.08.2026 of the Director of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI–BAS), I have been appointed a member of the scientific jury of the competition for the academic position of **“Professor” at IMI–BAS** in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 Informatics and Computer Science, scientific specialty “Informatics” (Cognitive Models and Artificial Intelligence for Multimodal Data), for the needs of the “Mathematical Linguistics” section at IMI–BAS.

This opinion has been prepared in accordance with the requirements of the Academic Staff Development in the Republic of Bulgaria Act (ASDRBA), the Rules for the Implementation of the ASDRBA (RI-ASDRBA) and the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Holding Academic Positions at IMI–BAS (IMI Regulations).

The set of materials submitted by Assoc. Prof. Alexander Iliev, PhD **is in compliance** with Art. 9, para. 1 of the IMI Regulations.

2. Candidacy data and compliance with the requirements

Assoc. Prof. Alexander Iliev, PhD completed higher education at the University of Mining and Geology “St. Ivan Rilski” - Sofia in 1996 with a qualification of Master of Science in Electrical Engineering. In 1996 he obtained a second specialty, “Multimedia Technologies”, from the Technical University – Sofia. Assoc. Prof. Alexander Iliev, PhD also received a master’s degree in sound engineering from the University of Miami, Florida, in 1999. He successfully defended a doctoral dissertation in 2009 at the University of Miami, Florida, Faculty of Electrical and Computer Engineering, on the topic: “Emotion Recognition Using Vocal and Prosodic Parameters”. He has presented a diploma for the educational and scientific degree “Doctor of Philosophy”, issued by the University of Miami, Florida, USA, on 17.12.2009, and diploma No.

000037 for the educational and scientific degree “Doctor” in Informatics, issued by the Institute of Mathematics and Informatics at BAS on 22.06.2015, whereby *he meets the conditions under Art. 29, para. 1, item 1 of the ASDRBA*.

As of 01.08.2026, Assoc. Prof. Alexander Iliev, PhD has 8 (eight) years and 8 (eight) months of work experience in the position of “Associate Professor” at IMI–BAS, whereby *he meets the conditions under Art. 29, para. 1, item 2 of the ASDRBA* (a certificate ref. No. 984/04.08.2026 from the Director of IMI–BAS, Corr. Member of BAS P. Boyvalenkov, is attached).

For participation in the competition, the candidate Assoc. Prof. Alexander, PhD Iliev has submitted: 1) two single-author monographs; 2) one book chapter; 3) 23 publications in scientific journals and in proceedings of international conferences. Of these, *18 have an impact factor (IF) in Web of Science and/or an impact rank (SJR) in Scopus, and 5 are indexed in Web of Science, Scopus and/or the ACM Digital Library*; 4) a utility model and 5) four textbooks. The submitted materials *are within the subject area of the competition and meet the minimum national requirements under Art. 2b, paras. 2, 3 and 5 of the ASDRBA*.

The analysis of the submitted documents shows:

- 1) Full compliance with the minimum national and additional requirements of BAS and IMI–BAS by groups of indicators, defined in the IMI Regulations, for holding the academic position of “Professor” in professional field 4.6, with *the number of points exceeding the minimum national requirements and the additional requirements of IMI–BAS by groups of indicators* (see the following table).

Group of indicators	Minimum requirements of the IMI Regulations	Minimum national requirements	Candidate's points by indicator
A	50 pts.	50 pts.	50 pts.
B: B4	100 pts.	100 pts.	130 pts.
G: G5, G7, G8 and G9	220 pts.	200 pts.	444 pts.
D: D11	140 pts.	100 pts.	186 pts.
E: E14, E15 and E19	150 pts.	100 pts.	280 pts.

- 2) Fulfilment of the requirement that candidates “have presented a published monograph or equivalent publications in specialized scientific journals that do not repeat those presented for obtaining the educational and scientific degree ‘Doctor’, the scientific degree ‘Doctor of Sciences’ and for holding the academic position of ‘Associate Professor’”, namely: *in the present procedure two monographs, one book chapter and 23 publications have been presented, which have not been used in previous procedures*. For the two monographs presented in the competition, the requirements of § 1, item 10 of the Additional Provisions of the ASDRBA have been met.
- 3) Fulfilment of the additional specific requirements of IMI–BAS for candidates for the academic position of “Professor”, pursuant to Art. 3 of the IMI Regulations: *the submitted documents fully meet these requirements* (see the following table).

Requirements for the publications submitted for the competition	Submitted by the candidate	Minimum required
Art. 3, Para. 2, Item 4 for Professional Field 4.6: Of the publications submitted for participation in a competition for the academic position of “Professor”, the candidate must have at least 12 publications in journals with an IF or SJR.	18 pcs.	12 pcs.
Art. 3, Para. 4: When applying for the academic position of “Professor”, at least half of the total number of publications required under Art. 3, Para. 1 and 2 must have been published or accepted for publication after the date of the last of the procedures for acquiring the educational and scientific degree “Doctor”, for acquiring the scientific degree “Doctor of Sciences”, or for holding an academic position.	25 pcs.	13 pcs.*

* The number is determined on the basis of the total of 26 scientific publications submitted by the candidate for the competition (including two monographs, one book chapter and 23 other publications).

- 4) Fulfilment of Art. 29, para. 1, item 6 of the ASDRBA: *no plagiarism has been proven in accordance with the procedure established by law or falsification of scientific data in the candidate’s scientific works.*

3. General characterization of the activities and achievements of the candidate, presented in the competition materials

The scientific works submitted for participation in the competition by Assoc. Prof. Alexander Iliev, PhD can be classified as follows: by type (monographs – 2, book chapters – 1, articles in refereed periodicals – 18; papers in proceedings of international conferences – 5, university textbooks – 4), by language in which they are written (in English – 30), by significance (*3 articles are in journals with an impact factor (IF) and impact rank (SJR), and 15 are in journals with an impact rank (SJR) only*), *1 scientific publication is in quartile Q1, 1 in quartile Q2 and 1 in quartile Q4 in Web of Science*, by number of co-authors (sole author - 9; with one co-author - 15; with two co-authors - 3; with four or more co-authors - 3). Assoc. Prof. Alexander Iliev, PhD is the first author in 14 scientific publications submitted for the competition.

The candidate links his research with project work for its practical implementation and use in practice, which is highly valued in contemporary research in the field of informatics. Participation in research and educational projects is presented – *5 international and 2 national projects* (a reference from Prof. Rumen Nikolov, PhD regarding the candidate’s participation in international research projects outside IMI–BAS is attached). It is essential to note the participation in *the development of utility model No. 5104 U1 / 29.08.2025 “Computer-implemented system for big data processing”, registered with the Patent Office of the Republic of Bulgaria*. Assoc. Prof. Alexander Iliev, PhD also declares participation in editorial boards of international scientific journals; he is a member of program committees and an organizer of scientific forums related to artificial intelligence, machine learning and digital ecosystems; he has participated in the Attestation Committee of IMI–BAS and other activities.

The contributions in the works submitted by Assoc. Prof. Alexander Iliev, PhD for participation in the competition can be classified into *three thematic areas*:

- 1) Research and development of methodologies and algorithms related to the automation of the processes for identifying the emotional charge in speech;
- 2) Scientific developments in the field of the development of intelligent (smart) ecosystems through the use of artificial intelligence (AI) and large language models (LLMs);
- 3) Research and creation of new models in the field of financial and pricing factors with direct applications in practice.

Key scientific contributions that can be noted are:

- New methods for detection, selection and recommendation of content through emotions in speech and text: a system for selecting media content by emotional cues, a hybrid recommendation system that solves the “cold start” problem, a regression model for predicting numerical intervals from text, classification of acoustic events [1, 7, 10, 11];
- Systematization and comparative analysis of methods for emotion recognition from speech [G];
- Cross-cultural analysis of emotions in speech (CNN, MFCC) for 3 and 4 languages and a context-independent system for sentiment extraction [3, 4, 8];
- A unified conceptual framework and a multi-criteria model for evaluating generative AI systems. An experimental methodology for comparing AI platforms on identical ML tasks [A, B];
- Conceptual models for multimedia automation (DSP + ML) in intelligent ecosystems and smart cities [5, 6]; A model for the secure use of RAG systems with protection of personal data [23];
- Methods and analyses for DeepFake detection (CNN, transfer learning with ResNet50, Explainable AI); systematization of DeepFake technologies and detection methods [17, 18, 19, 21];
- A framework for detecting and mitigating bias in code generated by LLMs [14].

The main *scientific-applied contributions* of the candidate are:

- A hybrid Big Data architecture model combining Lambda + Kappa approaches [16];
- SOA architecture for personalized access to digital cultural resources [2];
- An AI framework for the perception of autonomous vehicles, including object detection, semantic segmentation, pedestrian recognition and traffic sign classification [15];
- Models for predicting the risk of diabetes and stroke [22]; Models for predicting real estate and cryptocurrency prices [9, 20];
- An approach for predicting and limiting product returns by customers on online platforms [13];
- Educational frameworks in AI and machine learning, combining theory, mathematical models and experimental evaluation [C, D, E, F].

Significant *applied contributions* of the candidate that can be noted are:

- A system for detecting fake user reviews on the Amazon platform, aimed at increasing the reliability of ratings for products and sellers [12];
- A computer-implemented big data processing system registered as a utility model [H].

The significance of the candidate's research results is evidenced by their reflection in the works of other authors. In the present procedure, 31 citations of 10 scientific works of Assoc. Prof. Alexander Iliev, PhD are accepted, all in the world scientific databases (Scopus and/or Web of Science) and not used in another procedure.

The contributions and the scientific and scientific-applied activity characterize the candidate Assoc. Prof. Alexander Iliev, PhD as an established scientist with significant achievements, which give every reason to claim that he fully meets the notion of a leading researcher in the field of informatics and, in particular, in cognitive models and artificial intelligence for multimodal data.

Assoc. Prof. Alexander Iliev, PhD has presented information on teaching experience of more than twenty years in the United States of America and Germany. He is currently a professor and academic director of the master's program "Big Data and Artificial Intelligence" at SRH University of Applied Sciences (Germany). He teaches the following courses in the field of artificial intelligence: AI Use Cases, Python Programming for AI, Machine Learning. Since 2012 he has been a lead mentor at the University of California, Berkeley Extension, where he develops and teaches the following courses: Machine Learning, Deep Learning, Data Science, Python for Scientific Computing, TensorFlow and Applied Machine Learning. He has also taught at the University of Wisconsin, the University of Miami and others. For the needs of the students of the School of Technology and Architecture of SRH University of Applied Sciences, Assoc. Prof. Alexander Iliev, PhD has published four university textbooks, used in the master's program "Big Data and Artificial Intelligence" in the course "Machine Learning" (confirmation letters from Prof. Michael Hartmann, PhD Academic Director and Dean of the School of Technology and Architecture at SRH University of Applied Sciences, are attached). The candidate takes an active part in the academic growth of students and in improving the educational process. He has supervised a large number of master's theses. The teaching activity of Assoc. Prof. Alexander Iliev, PhD deserves a high evaluation.

4. Critical remarks and recommendations

I have no critical remarks regarding the materials submitted by the candidate for the competition. I take into account the fact that serious research in the scientific field in which Assoc. Prof. Alexander Iliev, PhD works is, as a rule, a collective endeavor, but I have no doubts about his contribution in the submitted materials. I recommend that Assoc. Prof. Alexander Iliev, PhD publish actively in journals with an impact factor and a high quartile.

CONCLUSION

The documents and materials submitted by Assoc. Prof. Alexander Iliev Iliev, PhD **meet all the requirements** of the Academic Staff Development in the Republic of Bulgaria Act (ASDRBA), the Rules for

the Implementation of the ASDRBA and the relevant Regulations of BAS and IMI–BAS. The research activity **fully corresponds** to the minimum national and additional requirements of the Institute of Mathematics and Informatics at BAS. **I give my positive evaluation** and **strongly recommend** that the Scientific Jury prepare a report-proposal to the Scientific Council of the Institute of Mathematics and Informatics at BAS for the election of Assoc. Prof. Alexander Iliev Iliev, PhD to the academic position of “Professor” at IMI–BAS in the field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 Informatics and Computer Science, scientific specialty “Informatics” (Cognitive Models and Artificial Intelligence for Multimodal Data).

15.10.2026

Opinion prepared by:

(Prof. Desislava Paneva-Marinova, PhD)