OPINION

in a competition for the academic position of "Associate Professor" at IMI-BAS in the professional field 4.6 "Informatics and Computer Science", specialty "Informatics" (Adaptive Educational Software Systems), with a candidate Desislava Dakova Vasileva PhD

Opinion by Prof. Radoslav D. Yoshinov, PhD

In connection with the procedure for a competition at IMI BAS for the academic position of "Associate Professor" announced in the State Gazette No. 63 of 10.07.2026 in: field of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and Computer Science, scientific specialty "Informatics" (Adaptive Educational Software Systems), and Order of the Director of IMI BAS No. 88/08.09.2026 and in accordance with Art. 4 of the Law on the Development of the Academic Staff in the Republic of Bulgaria, Decree No. 26 of February 19, 2019, the Regulations on the Specific Conditions for an Academic Position at IMI BAS, I have been appointed as a member of the scientific jury.

For participation in the competition for the academic position of **Associate Professor** in the professional field 4.6 "Informatics and Computer Science", specialty "Informatics" Dr. Desislava Dakova Vasileva has submitted documents.

As a member of the Scientific Jury, I have received:

1. Order of the Director of IMI BAS No. 88/08.09.2026;
2. Regulations on the terms and conditions for acquiring scientific degrees and for occupying academic positions at IMI BAS.
3. Copy of the diploma for Master of Mathematics from 28.06.2008;
4. Copy of the diploma for scientific and educational degree "Doctor" from 22.12.2011;
5. Creative autobiography;
6. Declaration of originality and authenticity;
7. List of all publications of Dr. Desislava Dakova Vasileva;
8. List of publications submitted for the competition by Dr. Desislava Dakova Vasileva;
9. Author's reference by Dr. Desislava Dakova Vasileva;
10. List of quotes by Dr. Desislava Dakova Vasileva;
11. Publications;
12. Additional documents

Note: all required documents for the competition were provided in electronic form.

I have been selected to write an opinion on the procedure at the first meeting of the scientific jury on 30.09.2026 The opinion was prepared in accordance with **the Law on the Development of the Academic Staff in the Republic of Bulgaria,** the Regulations for the Implementation of the Law on the Acquisition of Scientific Degrees and for Occupying Academic Positions at IMI BAS.

Table of compliance with the minimum requirements by groups of indicators for the academic position of "Associate Professor" according to the Law on Academic Studies and the Regulations of IMI-BAS and their implementation by the candidate Dr. Desislava Dakova Vasileva:

Indicator group	Points of the candidate	Minimum required points according to IMI-BAS
Indicator Group A	**50**	50
Group of indicators C	**130**	100
Indicator group D	**346**	220
Group of indicators E	**150**	70
Indicator Group F	**170**	20

All this proves that the candidate, Dr. Desislava Dakova Vassileva, fulfills and exceeds all the requirements of Art. 24 para 1 of the Law on the Elimination of Discrimination and Discrimination against Women, as well as all the requirements of with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Law on the Acquisition of Scientific Degrees and for Occupying Academic Positions at IMI BAS..

Brief biographical data about the candidate.

The candidate, Dr. Desislava Dakova Vasileva, holds a Master's degree in Mathematics from Sofia University "St. Kliment Ohridski" (1996 – 2002). In 2011 she defended her dissertation on "Adaptive Software Systems for E-Learning" and acquired the educational and scientific degree of "Doctor". She has more than two years of research activity in the specialty – as a research assistant at the Research Institute at Sofia University "St. Kliment Ohridski". St. Kliment Ohridski" (2008–2011), on research projects at the Research Institute at Sofia University (2015–2018) and as an R2 researcher at the Center of Excellence "Heritage BG" (2020–2021), thus satisfying the requirement of Art. 24, para. 1, item 2 of with the Law on the Development of the Academic Staff in the Republic of Bulgaria.

The scientometric profile of the candidate, Dr. Desislava Dakova Vassileva, has an h-index of 7 in Scopus, 5 in Web of Science and 13 in Google Scholar, which shows that she is an established scientist with international visibility.

General description of the submitted materials for the competition.

The candidate has provided a complete list of 59 publications, and for the competition - 22 scientific publications and two useful models.

The submitted materials by the candidate for the competition are as follows:

- 22 publications (+ 2 useful models);
- Publications in proceedings of international scientific conferences – presented 18.
- Scientific publications in journals – 4 are presented.

Of the 4 journal publications submitted, 3 are indexed in Web of Science and Scopus, of which 2 are IF (in Q1 and Q2), and one is in a journal indexed in MathSciNet. 18 of the publications are in proceedings of international scientific conferences, indexed in Web of Science, Scopus or ACM Digital Library, 11 of which are SJR.

For the purposes of the competition, the candidate submits a list of 73 proven citations without self-citations, of which 48 in journals indexed in Web of Science or Scopus, and 25 in peer-reviewed journals outside them. The total citation rate for her entire career, including self-citations, reaches 163 citations in Scopus and 519 in Google Scholar. For indicator group D, the candidate has 150 points with a minimum required 70;

Projects – evidence of participation in 12 research projects is presented, of which 5 international (FP6, FP7, Horizon 2020, Erasmus+) and 7 national; currently the candidate participates in the MOTIVATE project of the NSF.

The candidate is a member of the program committees of international scientific conferences and has presented papers at international scientific forums. She was a part-time assistant professor at the Faculty of Mathematics and Informatics of Sofia University in the disciplines "Modern Markup Languages", "Java Programming" and "XML Technologies and Semantic Web".

The submitted materials for the competition do not repeat others used in the procedures for acquiring the educational and scientific degree of "Doctor" and for occupying academic positions. I have not noticed plagiarism in the submitted materials.

Scientific results and contributions.

At the place of habilitation work (indicator group B), 4 leading publications (B1-B4) are presented, bringing 130 points (with a minimum of 100), among which there is an article in the prestigious journal Computers in Human Behavior with an impact factor of 4.306 (quartile Q1) and an article in Applied Sciences with an impact factor of 2.9 (quartile Q2).

The numbering of the publications cited below follows the "Reference on Original Scientific Contributions" enclosed by the applicant in its entirety.

According to their content, the scientific papers submitted for participation in the competition can be classified in the following scientific fields:

I. Adaptive education systems and e-learning

II. Adaptation according to the emotional state and recognition of behavioral patterns in educational games

III. Game Learning and Serious Educational Games

IV. Tools for measuring the emotional state of the user

In the field – I. Adaptive educational systems and e-learning. Part of the research in this field is a continuation of the work of the candidate on the doctoral dissertation.

This field includes 8 scientific publications numbered 1, 2, 3, 4, 5, 6, 7 and 14 of the materials submitted for the competition. They develop the conceptual model, the formal adaptive rules, the design methodology and the software architecture of an adaptive e-learning system (the ADOPTA platform), as well as the architecture of the APOGEE platform for the construction of educational video games.

In the direction – II. Adaptation according to the emotional state and recognition of behavioral patterns in educational games – includes 4 scientific publications numbered 8, 9, 10 and 11 of the materials submitted for the competition. The direction is dedicated to the dynamic adaptation of educational video games based on the emotional state of the player, assessed by electrodermal activity and facial expressions, and to the automatic recognition of patterns of the learning curve in real time.

By direction – III. Game training and serious educational games

It includes 10 scientific publications numbered 12, 13, 15, 16, 17, 18, 19, 20, 21 and 22 of the materials submitted for the competition. The direction covers game styles, requirements for platforms and tools for the construction and analysis of educational games, as well as the application of serious games with a labyrinth for cultural heritage, climate resilience, social education and technological entrepreneurship.

Under direction – IV. Tools for measuring the emotional state of the user

This strand covers the registered utility models No. 3234 U1 and No. 4406 U1. They propose electronic devices for measuring skin conductivity for assessing individual emotional arousal based on its absolute values, applicable to objectively measuring users' responses to learning and play.

In the four areas considered, the following main contributions can be outlined, which can be divided into approaches, models and methodologies:

Approaches are proposed for:

- separation of adaptive rules from business logic through formalization with predicate logic and implementation with Drools and SWRL, which allows change of adaptation at runtime without recompiling [1];
- adaptive assessment, combining adaptive tests with games, essays, projects, self-assessment, and mutual assessment according to Honey and Mumford's learning styles [5];
- dynamic adaptation of the difficulty of educational games according to the emotional state and performance of the player [8], [9];
- recognition of real-time learning curve patterns and adaptation of the game scenario through a programme component developed under the RAGE project of Horizon 2020 [10], [11];
- measuring and mitigating racial prejudice through a maze video game and personalized puzzles [15];
- cultural heritage education through serious maze video games [17], [18];
- raising awareness of the vulnerability and resilience of climate heritage through 3D video games designed according to the revised Bloom Taxonomy [19];
- training in entrepreneurship and strategic management through hierarchical 3D labyrinths with mini-games [21];

Models **of the following** have been created:

- a two-layer hierarchical model of an adaptive hypermedia system, extending the AHAM reference model, with three sub-models – learner, content and adaptation [2], [7];
- a lightweight semantic model of the learning content built on UML class diagrams as a basis for logical educational games [4];
- a family of four playing styles (Competitor, Dreamer, Logician, and Strategist) based on Kolb's theory, with a validated questionnaire of 40 statements [12];
- a formal descriptive model of an educational video game with a maze on the APOGEE platform [14];
- virtual players with an intelligent conversational agent and adaptive emotional behavior based on neural networks [20];

Methodologies **for the following are proposed**:

- constructing a graph of the narrative of an adaptive course and choosing the optimal working path through the scalar product of the vector of weights and vectors of the learning style [3], [7];
- experimental validation of adaptive delivery of learning content – in an experiment with 84 students, the adaptive group achieved an average score of 77.89% versus 67.14% in non-adaptive learning [6];
- automated construction of educational video games by non-programmers in three stages – design, validation and generation [13], [14], [17];
- analysis and visualization of learning and game data [16];
- assessment of educational effectiveness and game experience in serious games [18], [19];

- a systematic review using the PRISMA methodology of 246 publications on approaches to adaptation and personalization in educational video games [22].

I accept the contributions formulated in this way.

The presented materials reflect designed and implemented software platforms (ADOPTA and APOGEE), educational video games and tools for data analysis and visualization.

Under strand IV, two utility models are presented.

Critical Notes.

The very good organization and good quality of the candidate's materials, both in content and layout, is impressive. I noticed only some minor technical inconsistencies. This does not detract from the large volume of research, scientific and applied work of the candidate, which confirms her as a scientist.

The relatively high citation rate in indexed publications makes a pleasant impression. I accept the distribution of publications in the four thematic areas presented by the candidate, although they merge into each other and no clear boundary can be drawn between them. It would be good to show the influence of these publications on more than one strand, as can be seen from their reading. This would show the interaction of the presented thematic areas in their dynamics and would outline the topics of the competition more focused.

The submitted documents show that the candidate has already proven her ability to work in a team as a participant in international and national research projects.

Conclusion

The requirements, conditions and criteria of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations on the Terms and Conditions for Acquiring Scientific Degrees and Occupying Academic Positions at IMI BAS have been met and I give a categorically **positive conclusion** for the selection of Dr. Desislava Dakova Vassileva in a competition for Associate Professor in the professional field 4.6. "Informatics and Computer Science".

Expressing a positive opinion on the submitted materials, I propose to the esteemed Scientific Jury to unanimously vote on a proposal to the Scientific Council of IMI BAS to elect Dr. Desislava Dakova Vasileva for the academic position of Associate Professor in the professional field 4.6 "Informatics and Computer Science", specialty "Informatics".

21.10.2026 Prepared the opinion:

/prof. Dr. Radoslav Yoshinov/