

OPINION

**by Dr. Stoyan Nikolov Cheresarov,
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of the materials submitted for participation in the competition
for occupying the academic position of **“Professor”**
at University of Plovdiv Paisii Hilendarski

in the field of higher education: 4. Natural Sciences, Mathematics and Informatics
professional field: 4.6. Informatics and Computer Science (Artificial Intelligence)

In the competition for the academic position of “Professor”, announced in the State Gazette, issue 98 of November 19, 2024, and on the official website of University of Plovdiv Paisii Hilendarski, for the needs of the Department of Computer Informatics at the Faculty of Mathematics and Informatics, the sole candidate is Associate Professor Dr. Stanka Ivanova Hadzhikoleva from the Department of Computer Informatics at University of Plovdiv Paisii Hilendarski.

1. General Overview of the Procedure and the Candidate

By Order № RD22-443 dated February 18, 2025, issued by the Rector of University of Plovdiv Paisii Hilendarski (PU), I was appointed as a member of the academic jury for the competition for the academic position of Professor at PU, in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional field: 4.6. Informatics and Computer Science (Artificial Intelligence), announced for the needs of the Department of Computer Informatics at the Faculty of Mathematics and Informatics.

For participation in the announced competition has submitted documents one candidate - Assoc. Prof. Stanka Ivanova Hadzhikoleva.

The set of materials submitted by Assoc. Prof. Hadzhikoleva on electronic media is in accordance with the Regulations for the Development of the Academic Staff of PU.

For participation in the competition, Assoc. Prof. Hadzhikoleva has submitted a total of 30 scientific publications and 1 textbook. Of these, 25 are indexed in SCOPUS and/or Web of Science. Seven (7) of the publications are in scientific journals with an impact factor (IF), and twelve (12) have an impact rank (SJR). All scientific works have been published after obtaining the academic position of "Associate Professor" and are accepted for review. A complete list of scientific publications has been submitted, along with copies of the works for participation in the competition, reports verifying compliance with the minimum national requirements and the additional faculty requirements of the Faculty of Mathematics and Informatics (FMI), a declaration of originality and authenticity of the submitted documents, annotations of the materials and a self-evaluation of contributions under Article 76 of the Regulations for the Development of the Academic Staff of PU (in Bulgarian and in a foreign language), an extended habilitation report on scientific contributions, a list of identified citations, documents related to teaching and research activity, as well as documents certifying work experience, acquired Master's degree, PhD degree, and certificate for the academic position of "Associate Professor".

Assoc. Prof. Hadzhikoleva obtained a Master's degree in Mathematics, with a specialization in Informatics and a teaching qualification, from University of Plovdiv Paisii Hilendarski in 2000. In 2013, she was awarded the doctoral degree (PhD) in the professional field 4.6. Informatics and

Computer Science. At the beginning of her career, she worked as a teacher of Informatics, Information Technologies, and Computerized Accounting, as a system software support specialist, and later as a managing partner in a software development company. Since 2002, she has been employed at University of Plovdiv Paisii Hilendarski as an Assistant and Senior Assistant, and since 2016 she has held the academic position of Associate Professor. Between 2014 and 2024, she has also delivered lectures at other universities, including the University of Agribusiness and Rural Development – Plovdiv, the Academy of Music, Dance and Fine Arts – Plovdiv, Burgas Free University, the Technical University – Plovdiv Branch, and Trakia University – Stara Zagora.

I have direct observations of the work of Assoc. Prof. Dr. Stanka Hadzhikoleva both within the Faculty and in various academic forums and initiatives. She stands out with her serious attitude toward her responsibilities, collegiality, and high professional ethics. Noteworthy is her active role in supporting students and young faculty members, as well as her willingness to participate in scientific and organizational activities.

2. General Overview of the Candidate's Activities

During the period 2016–2025, in which Assoc. Prof. Hadzhikoleva has held the academic position of "Associate Professor", she has delivered lectures in the following compulsory courses: Databases, Introduction to Cloud Technologies, Software Technologies 2, and Mobile Applications. She has developed new elective courses and has taught classes in Intelligent Data Analysis with Orange, Graph Databases with Neo4j, Introduction to Big Data and Cloud Computing, Business Process Modeling, Structuring and Presenting Scientific Papers, and Structuring and Presenting Theses and Scientific Papers. She has developed numerous electronic learning resources and courses. In co-authorship with colleagues from the Faculty of Mathematics and Informatics, two textbooks have been published: Fundamentals of Programming with Java (2016) and Introduction to Databases (2023).

The candidate is actively involved in extracurricular academic activities. Between 2016 and 2024, twelve students have successfully completed their Bachelor's degrees under her supervision. She is the academic advisor of seven PhD students, two of whom have successfully defended their doctoral dissertations. She has also served as an academic mentor to more than 40 students who have completed practical training in business organizations.

Assoc. Prof. Hadzhikoleva has participated in numerous research projects. She is the project leader of four university scientific and educational projects involving more than 60 students, PhD candidates, and young researchers. The aim of these projects is to develop scientific competencies among students and PhD candidates and to stimulate the growth of their creative and scientific potential for conducting high-quality research.

The candidate's overall scholarly output includes 118 scientific works (2 monographs, 2 books, and 114 articles published in journals and conference proceedings) and 2 textbooks. A review of Assoc. Prof. Hadzhikoleva's profiles in scientometric databases shows that she has 50 indexed documents in SCOPUS, 136 citations, and an H-index of 5; in Web of Science, she has 25 indexed documents, 61 citations, and an H-index of 4.

The materials submitted for participation in the competition significantly exceed the minimum requirements. For example, in Group B, 279 points have been reported, with a minimum requirement of 100 points; in Group G – 612 points reported, with a requirement of 200 points; in Group D – 608 points reported, with a requirement of 100 points; and in Group E – 190 points reported, with a requirement of 100 points. With regard to the additional requirements of the Faculty of Mathematics and Informatics for holding the academic position of "Professor" – 30 publications have been submitted, while the minimum requirement is at least 25; of these, 29 are published in journals or proceedings of international conferences, with a minimum requirement of 15 such publications; 15

publications are in journals, with the minimum being at least 10 journal publications; one textbook has been submitted, meeting the requirement of at least one textbook or teaching aid; and a list of 76 known citations has been provided, exceeding the minimum requirement of at least 20 citations.

The scientific works submitted for participation in the competition fall into three areas: Education and Artificial Intelligence (AI), Artificial Intelligence Models, and Neural Networks – Architectures and Research.

The main scientific contributions include: determining upper bounds for the number of hidden layers and the number of neurons in them for approximating artificial neural networks; a model for interpolating missing parts of surfaces; an algorithm for improving the accuracy of extrapolation using neural networks by generating additional training data; a model of a system for electricity consumption forecasting; a conceptual model of an instance of a pedagogical pattern; a formal model of the assessment process of learners; an approach and model for automated comprehensive assessment of higher-order thinking skills; and a model for hierarchical multicomponent assessment based on Bloom's taxonomy. Among the scientific-applied contributions are: developed neural network models for multifactor electricity consumption forecasting; a methodology for designing educational games using ChatGPT; a model of a cloud-based application for automated test creation and management using generative artificial intelligence; a conceptual framework for an e-learning software system based on pedagogical patterns; models for quality assurance in higher education; and instructional models – for developing higher-order thinking skills, for fostering scientific competencies, and more. Applied contributions include developed prototypes of artificial intelligence applications – for test modeling and management, for storing and analyzing information on bioactive peptides, for predicting order fulfillment times in the textile industry, as well as educational games created using generative artificial intelligence. Various empirical experiments have been conducted that are of significance for teaching activities.

Based on the submitted materials, including co-authorship with other colleagues and students, it can be concluded that the candidate has a significant personal contribution to the scientific developments. The thematic consistency and long-term work in the selected research areas indicate the active role of Assoc. Prof. Hadzhikoleva in generating ideas, developing methodologies and models, as well as in their experimental validation and publication. Some of the publications are co-authored with students and PhD candidates, which further confirms her leading role as a researcher and scientific supervisor.

3. Critical Remarks and Recommendations

I have no significant substantive or formal remarks regarding the submitted scientific works and materials. I would recommend that Assoc. Prof. Hadzhikoleva continue her active work in the field of artificial intelligence, with a focus on the development of innovative educational applications and the enhancement of assessment models in education. It is also advisable to increase publication activity in journals with a high impact factor and to continue the good practices of involving students and PhD candidates in research activities.

CONCLUSION

The documents and materials submitted by Assoc. Prof. Hadzhikoleva meet all the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), the Regulations for the Implementation of the LDASRB, and the relevant regulations of University of Plovdiv Paisii Hilendarski. The candidate's works contain original scientific and applied contributions that have received international recognition, with a representative portion

published in journals and scientific collections issued by international academic publishers. Her theoretical developments have practical applicability, with some directly oriented toward educational work. The scientific and teaching qualifications of Assoc. Prof. Hadzhikoleva are beyond doubt.

The results achieved by Assoc. Prof. Hadzhikoleva fully comply with the minimum national requirements and the additional requirements of the Faculty of Mathematics and Informatics, adopted in accordance with the Regulations of PU for the implementation of the LDASRB.

After reviewing the materials and scientific works submitted for the competition, and analyzing their significance as well as the scientific, scientific-applied, and applied contributions they contain, I find it justified to give my **positive evaluation** and to recommend that the Scientific Jury prepare a report-proposal to the Faculty Council of the Faculty of Mathematics and Informatics for the election of Assoc. Prof. Dr. Stanka Ivanova Hadzhikoleva to the academic position of Professor at University of Plovdiv Paisii Hilendarski, in the field of higher education: 4. Natural Sciences, Mathematics and Informatics, professional field: 4.6. Informatics and Computer Science (Artificial Intelligence).

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Prepared by:

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