OPINION

by Professor Dr. Vladimir Monov,

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ABOUT

documents and scientific papers submitted in a competition for the academic position of "associate professor"

<u>Field of higher education:</u> 4. Natural sciences, mathematics and informatics,
<u>Professional field:</u> 4.6 Informatics and computer sciences,
<u>Specialty:</u> Informatics,

announced in the State Gazette No. 97 of 15.11.2024 for the needs of the "Modeling and Optimization" Department at the Institute of Information and Communication Technologies-BAS with the only candidate Assist. Prof. Dr. Kristina Ivanova Dineva.

By order No. 9 of 10.01.2025 of the Director of IICT-BAS, I am included in the scientific jury for the announced competition for the academic position of "associate professor". By a decision of the scientific jury at a meeting held on 16.01.2025, my participation in the work of the jury was determined by the preparation of an opinion on the submitted materials. Documents for participation in the competition were submitted by the only candidate, Dr. Kristina Dineva, Assistant Professor in the "Modeling and Optimization" Department of IICT. As a member of the Scientific Jury, I have received the following materials of the candidate:

1. Curriculum vitae in European format;
2. Copy of diploma for the educational and scientific degree "doctor";
3. Certificate of work experience;
4. List of scientific publications for participation in the competition;
5. List of citations;
6. Abstracts of scientific publications for participation in the competition in Bulgarian and English.
7. Copies of scientific publications for participation in the competition;
8. Reference for fulfillment of the minimum requirements of IICT-BAS;
9. Reference for fulfillment of the minimum requirements of NACID.
10. Reference for the original scientific and applied scientific contributions;
11. Declaration that there is no legally established plagiarism in the scientific works;
12. Certificate of participation in projects.
13. Certificates for awards and diplomas received.

General characteristics of the submitted materials

According to the submitted materials, Assist. Prof. Dr. Kristina Dineva has acquired the educational and scientific degree "doctor" in Informatics, as evidenced by diploma No. 001323 dated 05.01.2021, issued by the Bulgarian Academy of Sciences for a defended dissertation on the topic "Integration of Heterogeneous Data from Distributed IoT Devices". From 2020 to the present, she has successively held the positions of "assistant" and "assistant professor" at IICT-BAS, where she has a total work experience of 5 years. The attached references for fulfilling the minimum national requirements and the requirements of IICT-BAS for holding the academic position of "associate professor" show that the requirements for all groups of indicators A, B, Г, Д and E are met and exceeded. A signed declaration of originality of the results in the scientific works is attached. For the assessment of the candidate by additional indicators according to Art. 57a para. (2) of PPZRASRB, copies of diplomas for awards received in scientific research activities and certificates for professional qualification have been submitted. All materials submitted by Dr. Dineva have been prepared in accordance with the ZRASRB, PPZRASRB, as well as with the Regulations on the specific conditions for acquiring scientific degrees and occupying academic positions at IICT-BAS.

Evaluation of scientific works

For participation in the competition under indicator B4 "Habilitation work", 3 publications with IF in WoS and SJR in Scopus were submitted, two of which are in quartile Q1 and one in quartile Q2 of WoS. The publications are co-authored, and in two of them the candidate is the first author. Under indicator D7 "Scientific publications in issues that are referenced and indexed in world-known databases of scientific information", 14 publications were submitted which are referenced and indexed in WoS and/or Scopus. One of them is in an edition with IF in quartile Q1 of WoS and 10 of the publications are in editions with SJR in Scopus. All publications are in English and do not repeat those for acquiring the educational and scientific degree "doctor". In essence, the candidate's works are of a scientific and scientifically applied nature, in the field of informatics and relate to the development and application of methods for collecting, processing, analyzing and evaluating data through the use of modern computer technologies. The results obtained have been published in highly prestigious publications, which testifiy to their high appreciation and international recognition. The scientific papers submitted for the competition undoubtedly show that the candidate Assist. Prof. Dr. Kristina Dineva, possesses in-depth knowledge, accumulated experience and significant achievements in her research activities.

Evaluation of Citations

The presented list of citations includes a total of 258 citations of 22 of the candidate's works. The noted citations are in works by national and foreign authors for the period 2018-2024. The majority of the citations are in prestigious publications that are indexed and referenced in the scientific information databases Scopus and Web of Science. The cited author's works are also in well-known scientific journals, reports at international conferences, Springer publications, etc. The presented data on the noted citations show that the candidate's scientific results have aroused wide interest and have been used in the works of both national and foreign scientists in the field of informatics and computer technologies.

Scientific and scientific-applied contributions

I accept and positively evaluate the contributions indicated in the attached reference of the candidate. They can be defined as scientific and scientific-applied and relate to the following areas of research.

- *Cloud technologies and infrastructures.* Effective approaches have been developed for integrating data from IoT devices, building a cloud infrastructure for collecting, processing and visualizing data in real time, using machine learning models for analyzing large volumes of data. The results obtained have been applied and tested in the field of intelligent animal husbandry for organizing animal monitoring, yield forecasting and environmental monitoring.

- *Machine learning and artificial intelligence.* Advanced and improved versions of machine learning algorithms have been proposed to increase their accuracy and optimization of multilayer perceptrons for time series prediction. An artificial neural network model (LSTM neural network) has been applied in the field of animal husbandry with high efficiency achieved in monitoring and analyzing animal behavior.

- *Methods and tools for data collection, analysis and processing.* Architectures have been developed for building of multisensor systems with IoT devices for integrating heterogeneous data from various sensors and communication modules, providing the opportunity for modeling and analyzing processes in real time. The proposed solutions have applicability in the animal husbandry sector by improving efficiency and increasing the accessibility of innovative technologies in this area.

The attached reference for contributions has been prepared in detail, outlining both scientific and scientifically applied contributions. All of them are reflected in the published scientific papers and can be assessed as significant and internationally recognized achievements in the candidate's work.

General characteristics of the candidate's activities

The candidate's materials demonstrate active scientific and research work and contain original scientific and scientifically applied results in the field of informatics and computer technologies. As an Assist. Prof. at IICT-BAS, Dr. Dineva actively participates in the implementation of projects at the Scientific Research Fund and the work in national scientific programs "Security and Defense" and "Intelligent Animal Husbandry". She has presented a number of reports at national and international scientific forums. Important candidate's contributions are achieved in the development and implementation of information and computer technologies in the field of modern animal husbandry. The certificates attached to the competition documentation testify to the acquired professional qualifications and research experience. For her overall activity, Dr. Dineva was awarded the "Prof. Marin Drinov" Young Scientist Award in 2021, as well as the IICT-BAS Award for Excellent Scientific Achievements in 2019 in the "Doctoral Students" category.

Remarks and Recommendations

I have no substantive remarks on the materials submitted for the competition. Given the results achieved so far, my recommendation to the candidate is to continue scientific and research activities with the preparation and publication of independent publications in prestigious national and international journals.

CONCLUSION

The materials of the competition and the candidate's results presented in them satisfy the requirements of the ZRASRB, the Regulations for its implementation, as well as the Regulations on the specific conditions for acquiring scientific degrees and occupying academic positions at IICT. My assessment of the overall activity of the candidate is positive.

I strongly recommend that the esteemed Scientific Jury vote on a proposal to the Scientific Council of the IICT-BAS for the election of Assistant Professor Dr. Kristina Dineva to the academic position of "associate professor" in Professional Direction: 4.6 Informatics and Computer Science, Specialty: Informatics, for the needs of the "Modeling and Optimization" Department in IICT-BAS.

Sofia,

04.03.2025

На основание

ЗЗЛД