OPINION

in a competition for the academic position "Professor"
in professional field 4.6 "Informatics and Computer Science", specialty "Informatics"
with candidate Assoc. Prof. Dr. Tatyana Vladimirovna Atanasova
opinion written by:
Prof. Dr. Radoslav D. Yoshinov

In connection with the procedure for competition in IICT-BAS for the academic position 'professor' announced in the State Gazette, issue. 103 of 12.12.2023 by: field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.6. Informatics and Computer Science (Informatics) and Order of the Director of IICT-BAS 41/09.02.2024 and in accordance with Art. 4 of the Law on the Development of Academic Staff in the Republic of Bulgaria, Decree No 26 of 19 February 2019, the Regulations on the Specific Conditions for Academic Position at IICT-BAS I have been appointed as a member of the scientific jury. of the candidate Assoc. Prof. Dr. Tatyana Vladimirovna Atanasova.

Assoc. Prof . Dr. Tatyana Vladimirovna Atanasova from IICT-BAS has submitted documents to participate in the competition for the academic position "Professor" professionally 4.6 "Informatics and Computer Science".

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

1. Order of the Director of IICT-BAS - 41/09.02.2024;

2. Copy of the diploma for scientific and educational degree "Doctor" with number 27553 of 31.10.2001;

3. Certificate of work experience;

4. Creative autobiography;

5. Declaration of originality and authenticity;

6. List of all publications of Tatyana Vladimirovna Atanasova;

7. List of submitted for the competition publications of Tatyana Vladimirovna Atanasova;

8. Author's reference of Tatyana Vladimirovna Atanasova;

9. List of quotes of Tatyana Vladimirovna Atanasova;

10. Publishing;

11. Additional documents

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

I was selected to write an opinion under the procedure of the first meeting of the scientific jury.

According to the Law on the Development of Academic Staff in the Republic of Bulgaria of Art. 29(1)2, the Implementing Regulations of the Law on Academic Staff in the Republic of Bulgaria), the Regulations for the specific conditions for acquiring academic degrees and for occupying academic positions in IICT-BAS (updated on 26.10.2022), candidates for the academic position of "professor" must meet the following requirements:

1. comply with the relevant minimum national requirements and the additional requirements of the IICT;

2. to have acquired the PhD as for specialties of the regulated professions, it should be of the same specialty;

3. have held the academic position "Associate Professor" in a higher school or scientific organization for at least five academic years, or

4. not less than five years:

(a) have been lecturers, including part-time lecturers, or members of a research team at a higher education institution or scientific organisation, or

(b) have exercised artistic activity, or

(c) have been specialists in practice and have a proven track record in their field;

5. have submitted published monographic work and/or equivalent publications in specialized scientific journals (including their citations) or evidence of relevant artistic achievements in the field of arts;

6. have presented other original research works, publications, inventions and other scientific and applied scientific developments or artistic and creative achievements, which are evaluated in their totality;

7. there must be no plagiarism in scientific works proven by the statutory order.

The candidate Tatyana Atanasova holds the degree "Doctor" since 2001. According to the official note for work experience issued by IICT, the candidate Tatyana Atanasova has experience in the position of "Associate Professor" - 20 years and 9 months, and has acquired the educational and scientific degree "Doctor" more than 22 years ago.

Table showing compliance by points of the requirements of the RASRB

Minimum required points by groups of indicators for Acad. position "Professor" and their respective performance by the candidate Assoc. Prof. Dr. Tatyana Atanasova:

Reference of Assoc. Dr. Tatyana Atanasova for compliance with the National Minimum Requirements for acquiring the academic position "Professor" under 4.6. Informatics and Computer Science			
Group of indicators	Necessary points	indicators	point
A	50		50
		A1. Dissertation for awarding educational and scientific degree "Doctor" (50 pts.)	50
B	100		165
		C4. Habilitation - scientific publications in editions that are referenced and indexed in world-famous databases with scientific information (Web of Science and Scopus)	165
Г	200		483
		D7. Scientific publication in publications that are referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus), outside habilitation work	483
Д	100		536

		D11. Citations in scientific publications, monographs, collective volumes and patents, referenced and indexed in world-famous databases of scientific information (Web of Science and Scopus)		*536*
E	100			420
		E13. Leadership of a successfully defended PhD student		*200*
		E14. Participation in a national scientific or educational project		*30*
		E15. Participation in an international scientific or educational project		*40*
		E17. Ръководство на българския екип в международен научен или образователен проект		*150*
		ToTAL		1654

All this proves that the candidate Tatyana Atanasova fulfills (exceeds) all the requirements of art. 29(1)1 of the ZRASRB, as well as all the requirements of the Regulations for the specific conditions for acquiring scientific degrees and for occupying academic positions in IICT-BAS.

Brief biographical details of the candidate.

The candidate Tatyana Atanasova is a graduated engineer with honors from the Faculty of Automation and Computer Science of the Moscow Energy Institute (Technical University). She works at IICT-BAS on a basic employment contract as an associate professor in the Modeling and Optimization Department, of which she is the head.

The scientificmetric profile of the candidate, Assoc. Tatyana Atanasova has 608.6 Research Interest Score, 363 citations in Research Gate, (h-index 9), in Scopus there are 52 indexed documents, h-index 7, which shows that she is an established scientist with international visibility.

General description of the submitted materials for the competition.

The candidate Tatyana Atanasova has provided a complete list of over 160 publications and 20 scientific publications for the competition.

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

Presented: 3 of the publications are with IF and SJR in Web of Science and SCOPUS, 10 are with SJR); 11 are papers from international conferences (SCOPUS).

Evidence was presented for 366 citations;

He is a supervisor of 4 successfully defended PhD students.

Projects – evidence of participation in 4 national and 4 international projects is presented, as a sample of only in recent years.

The candidate is a participant in program and organizing committees of scientific events. She has had lecture activities in 2 higher education institutions.

The submitted materials for the competition do not repeat others used in the procedures for acquiring educational and scientific degree "Doctor" and for occupying the academic position of "Associate Professor". I have not noticed plagiarism in the submitted materials. I have not noticed the same materials being used in more than one competition.

Scientific results and contributions.

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

I. Methods and processes for collecting, analyzing, modeling and applying information - 16 scientific publications

II. Vulnerability assessment and protection of computer systems and data - 3 scientific publications;

III. Virtual and Augmented Reality (VR and AR) for training purposes – 1 scientific publication.

By direction - I. Methods and processes for collecting, analyzing, modeling and applying information.

This direction covers - Internet of Things (IoT), where a systematic presentation of data collection and exchange over the Internet is made [B4-3, G7-6, G7-10, G7-12, G7-14, G7-17], cloud computing - providing resources on demand and providing computer services over the Internet [B4-1, G7-2, B4-2, G7-5]; data analysis –

identification of patterns, trends from large data sets, data mining, predictive analysis, data visualization [G7-1, G7-11, G7-3, G7-15, G7-13, G7-7];

By direction - II. Vulnerability assessment and protection of computer systems and data

This strand covers the use of techniques for the protection of computer systems and data, as well as vulnerability assessment [G7-4, G7-8, G7-16].

By direction - III. Virtual and Augmented Reality (VR and AR) for training purposes

This direction covers the use of 3D visualization, virtual learning, virtual environments [G7-9] .

In the three directions considered, the following main contributions can be outlined, divided into two groups: scientific and applied science. Publications containing relevant contributions are indicated.

As scientific contributions can be listed

· A data-driven intelligent monitoring system for target parameters in cloud environments has been developed [B4-1];

· A multidimensional classification has been proposed [G7-1];

· A model of an extensible IoT architecture is proposed to work with different communication protocols [B4-2];

· A set of methods for collecting, organizing and grouping data from heterogeneous sources on the Internet according to predefined rules and user requirements has been developed [B4-2, B4-3, G7-6, G7-10, G7-12, G7-14];

· A cognitive approach to modelling human-computer interaction in a distributed information environment has been proposed [G7-7, G7-13].

The applicability of the developed models and methods has been demonstrated through the scientifically applied results:

· A scalable cloud architecture for an intelligent system with application in livestock breeding has been implemented [24, 26, 30, 31, 37, 40].

· A methodology for the implementation of a workflow when working with heterogeneous data has been developed on the example of a modular IoT system by applying several methods for processing heterogeneous data [G7-14].

· A solution for modeling and simulations of digital twins for smart agriculture in cloud environments has been developed [G7-2].

· Properties and established areas of application of machine learning methods enriched with the methods of the ensemble for reinforcement, arrangement and packaging [G7-11] are systematized. An application of regression analysis in modelling target variables in the predictive model [G7-4] has been evaluated.

· Methods for creating models in an open source machine learning software environment are explored and opportunities for finding hidden dependencies in the collected datasets are identified [G7-3].

· Security aspects of IoT devices and systems with possible breakthrough paths and countermeasures have been investigated and defined [G7-16].

· An approach that combines TSA and Blockchain technologies to ensure data traceability in an IoT system is proposed [G7-4]

· A correlation approach is proposed to identify indirect links between different types of incidents in a convergent information infrastructure with the introduction of artificial intelligence for IT operations (AIOps) [G7-8]

· A positive effect of the use of virtual and augmented reality technologies on the learning ability of STEM learners has been studied and established [G7-9].

· A composition of atomic functions in various IoT services in modeling information services with a view to providing QoS is proposed [G7-17].

The reviewer accepts such formulated contributions and their separation into some scientific and scientifically applied ones.

Lecture work, participation in scientific projects and organization of scientific forums

According to the attached reports, Assoc.Prof. Dr. Tatyana Atanasova has lectured at the Higher School of Telecommunications and Posts in the period 2010-2016 in the disciplines "Higher

Mathematics", "Mathematical Modeling", "Communication Chains", "Mathematical Methods in Economics" and "Engineering Mathematics 1", and at SWU "Neofit Rilski" - lectures in the academic year 2017-2018 in Bachelor's and Master's programs in the disciplines "Data Transmission and Computer Communications", "Digital Communications", "Next Generation Networks".

As Associate Professor and Head of the Modeling and Optimization Department, the applicant is a participant in international and national projects and programs.

Critical remarks.

The very good organization and good quality of the candidate's materials are impressive, both in terms of content and shaping. The reviewer noticed only some minor technical inconsistencies and spelling errors. All this does not diminish the large volume of research, scientific and scientific-practical work of the candidate, shaping him as an established scientist.

A pleasant impression is made by the relatively high citation in indexed publications. The reviewer accepts the distribution of publications under the three thematic areas submitted by the candidate.

I have no comments on the materials provided. I believe that the contributions are well founded verbalised and illustrated by the attached publications. The rich lecture activity of the applicant in 2 higher education institutions should also be taken into account.

The candidate has four successfully defended doctoral students and is currently the supervisor of four others, two of whom are in front of defense. This shows the ability to guide young scientists in the described thematic areas, guiding them scientifically and supporting their career development.

The submitted documents show that the applicant has already proven his capabilities for teamwork (participant in international and national projects and teams).

Conclusion

The requirements, conditions and criteria of the Law on the Development of Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for the Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria (RASRB) and the Regulations on the specific conditions for acquiring

academic degrees and for occupying academic positions at IICT-BAS are met and I give a definite positive conclusion for the election of Assoc. prof. Dr. Tatyana Vladimirovna Atanasova.to "Professor" in 4.6. "Informatics and Computer Science".

Expressing a positive opinion on the submitted materials, I propose that the venerable Scientific Jury unanimously vote a proposal to the Scientific Council of IICT-BAS to choose Assoc. prof. Dr. Tatyana Vladimirovna Atanasova for the academic position "Professor" in professional field 4.6 "Informatics and Computer Science", specialty "Informatics".

March 21, 2024

На основание
ЗЗЛД