

R E V I E W

by Prof. Plamena Ventseslavova Zlateva, PhD - University of
National and World Economy
for Assoc. Prof. Irina Alexandrovna Radeva, PhD
in competition for the academic position of Professor
4.6. "Informatics and Computer Science", special. "Computer
Science (Blockchain Technologies and Models)",
announced in State Gazette No. 87/15.10.2024.

This review was prepared in my capacity as a member of the
Scientific Jury for the competition for the academic position
"Professor" in the professional field 4.6. "Informatics and
Computer Science", the specialty "Informatics (blockchain
technologies and models)", announced in State Gazette No.
87/15.10.2024 for the needs of the Intelligent Systems
Department - IICT - BAS, in accordance with the Order
312/13.12.2024 of the Director of the Institute of Information
and Communication Technologies - BAS Corr. Member Svetozar
Margenov, with the only candidate **Assoc. Prof. Irina
Alexandrovna Radeva, PhD.**

1. Brief biographical details of the candidate

Assoc. Prof. Irina Alexandrovna Radeva, PhD graduated in
Finance at the University of National and World Economy in 1995.
She joined the Bulgarian Academy of Sciences (BAS) in 2000 as a
Research Fellow II at the Institute of Information Technology.
From 2007 to 2011, she held the position of research assistant
I degree, and from 2011 to 2018 she was a senior assistant in
the "Intelligent Systems" Department of the Institute of
Information and Communication Technologies - BAS. Since 2018,
she has been an associate professor in the same department.

In 2012, she successfully defended her educational and
scientific degree "Doctor" in Informatics at the Institute of
Information Technologies at the Bulgarian Academy of Sciences.

From 2001 to 2010, Assoc. Prof. Irina Radeva, PhD was a
lecturer at the Department of Business Administration of New
Bulgarian University, where she delivered courses on financial
markets and instruments.

Since 2020, she has been an associate professor at the
Faculty of Economics, Trakia University, Stara Zagora, where he
has participated in the preparation of curricula related to
software systems and Internet technologies.

2. General information on the submitted documents and the fulfilment of the minimum requirements for the academic position of „Professor“

According to ADASRB, the Rules for the implementation of the ADASRB and the Regulations of the specific conditions for acquiring scientific degrees and for holding academic positions at IICT-BAS, the candidates for professor must meet certain conditions.

Art. 29(1) Candidates for the academic position of professor shall meet the following conditions:

1. to have obtained a doctoral degree...;
2. have held the academic post of Associate Professor in the same or another higher education institution or scientific organisation for at least two academic years... ;
3. to have submitted a published monographic work or equivalent publications in specialized scientific journals ... which do not repeat those submitted for the degree of Doctor of Education and Science, the degree of Doctor of Science and the academic position of Associate Professor;
4. have submitted other original research works, publications, inventions and other scientific and applied developments or artistic achievements, which are evaluated in aggregate;
5. meet the minimum national requirements referred to in Art. 2b(2) and (3) and Art. 2b(5) respectively;
6. have no legally proven plagiarism in scientific works.

(3) Candidates are required to submit a statement of fulfilment of the minimum national requirements under Art. 2b (2) and (3), respectively, of the requirements under Art. 2b (5), along with a statement of original scientific contributions. The relevant evidence specified in this Act, in the regulations of its implementation and in the regulations of higher education institutions and scientific organisations must be attached to this statement.

The documents submitted for the competition by Assoc. Prof. Irina Radeva, PhD comply with the requirements of the ADASRB, Rules for the implementation of the ADASRB and the Regulations of the specific conditions for acquiring scientific degrees and for holding academic positions at IICT-BAS.

Assoc. Prof. Dr. Irina Radeva **meets the conditions of Art. 29(1).1** as she has submitted Diploma for Doctorate Degree No. 000213/08.11.2012, **meets the conditions of Art. 29(1).2** as she has submitted official note No. 728/06.11.2024, signed by Corr. Member Sv. Margenov - Director, IICT-BAS, certifying that she has been an Associate Professor for 06 years and 05 months.

Assoc. Prof. Irina Radeva, PhD **meets the criteria of Art. 29(1).3**, as she has submitted three publications (Nos. 26, 22 and 23) for Group B, item 4 - Habilitation work - scientific publications in refereed and indexed journals in world-known databases of scientific information.

1. Radeva, I., Popchev, I., Doukovska, L., Dimitrova, M. Web Application for Retrieval-Augmented Generation: Implementation and Testing. *Electronics*, 13, 7, MDPI, Basel, Switzerland, 2024, ISSN:2079-9292, pp. 1-31. (SJR (Scopus):0.63, JCR-IF (Web of Science):2.9, Q2).
2. Popchev, I., Radeva, I., Doukovska, L. Oracles Integration in Blockchain Based Platform for Smart Crop Production Data Exchange. *Electronics*, 12, 10, MDPI, Basel, Switzerland, 2023, ISSN:2079-9292, pp. 1-20. (SJR (Scopus):0.63, JCR-IF (Web of Science):2.9, Q2).
3. Popchev, I., Radeva, I. Decentralised Application (dApp) Development and Implementation. *Cybernetics and Information Technologies*, 24, 2, Prof. Marin Drinov Academic Publishing House, 2024, ISSN:1311-9702, 122-141. (SJR (Scopus):0.46, JCR-IF (Web of Science):1.2, Q2).

28 publications are included in the **"List of scientific publications for participation in the competition for the academic position of professor"**: 3 publications are in journals with IF and SJR (Nos. 22, 23 and 26); 3 publications are in journals with SJR (Nos. 7, 9 and 17); 1 publication is a book chapter (No. 1); and 13 publications are conference papers in Scopus (Nos. 6, 9, 10, 11, 12, 14, 15, 16, 19, 20, 21, 24, and 25); 2 publications are chapters of collective monographs (nos. 27 and 28); 3 publications from academic publishing are **stand-alone publications** (nos. 18, 27, and 28). It should be noted that these publications do not repeat those submitted for the degree of Doctor of Education and Research and for the academic position of Associate Professor.

As detailed in the **"List of citations 2019 - 2024"**, there are **140 citations in Web of Science and/or Scopus**. With a total of 346 citations for the period 2019-2024, of which 140 are in the prestigious databases Web of Science and Scopus, the visibility of the research in which Assoc. Prof. Irina Radeva, PhD participates among the international scientific community is confirmed. The publications submitted to the competition have received a total of 203 citations, with some receiving a significant response, including publications No. 8 (15 citations), publications No. 27 and No. 1 (12 citations each) and publication No. 13 (11 citations). This citation rate reflects the timeliness and significance of the scientific contributions, as well as their international recognition in their respective scientific fields.

Assoc. Prof. Irina Radeva, **meets the criteria outlined in Art. 29(1).4**, having submitted 28 original research papers and other scientific and applied developments. She has participated in 18 national and 4 international projects, with seven of these being led by her.

Assoc. Prof. Irina Radeva, **meets the conditions of Art. 29(1).5**, and exceeds the minimum national requirements under Art. 2b, paragraphs 2 and 3, as well as the specific requirements of the IICT-BAS for the academic position of Professor. The summaries presented for the fulfilment of the minimum and specific requirements show the following results by groups of indicators:

- **Group A:** 50 points, which meets the national and IICT-BAS specific requirements;
- **Group C:** with minimum national and IICT-BAS specific requirements of 100 points, 180 and 120 points are achieved respectively;
- **Group D:** with a minimum national requirement of 200 points and a specific requirement of 260 points, 435 and 290 points were achieved respectively;
- **Group E:** with a minimum national requirement of 100 points and specific to IICT-BAS of 140, 1120 and 840 points were achieved respectively;
- **Group F:** with minimum national requirements of 100 points and specific to IICT-BAS - 150, 2300 and 1815 points were achieved respectively.

| Group of Indicators | Content | Professor in 4.6 Informatics and Computer Science | | | |
|---------------------|----------------------------------|---|-----------------|-------------------------------|-----------------|
| | | Minimum National Requirements | Achieved Points | Specific Requirements of IICT | Achieved Points |
| A | Indicator 1 | 50 | 50 | 50 | 50 |
| B | Indicator 3 | - | | - | - |
| C | Indicators 3 and 4 | 100 | 180 | 100 | 120 |
| D | Sum of Indicators from 5 to 10 | 200 | 435 | 260 | 290 |
| E | Sum of points in Indicator 11 | 100 | 1120 | 140 | 840 |
| F | Sum of Indicators from 12 onward | 100 | 515 | 150 | 515 |
| Total: | | 550 | 2300 | 700 | 1815 |

Assoc. Prof. Irina Radeva, also **meets the conditions of Art. 29(1).6** as she has no legally proven plagiarism in scientific works and has submitted a declaration.

3. General description of the proposed contributions of the candidate

According to Art. 29(3) of ADASRB, candidates in the competition must submit a "Summary of Original Scientific Contributions". Assoc. Prof. Irina Radeva, PhD, in accordance with Art. 10(1) of the "Regulations of the specific conditions for acquiring scientific degrees and for holding academic positions at IICT-BAS", has submitted a "**Summary of Original Scientific, Applied Scientific, and Applied Contributions**". In brief, the contributions can be systematised as follows:

1. Original Scientific Contributions:

- Models for Decentralized Blockchain Applications: Developed models for decentralized networks and knowledge bases utilizing smart contracts for access management, data validation, and traceability (№№ 8, 14, 15);
- Methods for Identification and Interpretation in InterCriteria Analysis: Algorithms for analysis in intuitionistic fuzzy triangles (№ 1);
- Multi-Criteria Selection of Blockchain Software: Developed approaches for group decision-making by integrating fuzzy assessments with classical methods for multi-criteria analysis (№ 9);
- Automated Testing of Large Language Models: Proposed an approach for evaluating large language models using Retrieval-Augmented Generation, implemented in a web application that measures result quality through a set of standard NLP metrics (№№ 25, 26).

2. Original Applied Scientific Contributions:

- Risk Management Models: Developed models and procedures for assessing and managing risks associated with Industry 4.0, with specific applications in agricultural technologies (№№ 2, 3, 4, 6, 11, 13);
- Applications of Blockchain Technologies in Smart Agriculture: Includes the decentralized SCPDx system for data storage and management, platforms for data exchange, knowledge bases, and the integration of IoT sensors for smart agriculture (№№ 10, 14, 15, 17, 19, 21, 22, 23, 24, 28);
- Data and Event Traceability: Integration of smart contracts and oracles for traceability and data management in decentralized systems (№№ 7, 12, 16, 17, 22, 24).

The contributions of Assoc. Prof. Irina Radeva, PhD are characterized by high scientific potential, innovation and applied value. They demonstrate the depth of research activity and the ability to develop solutions that address contemporary scientific and technological challenges. The developments presented are characterised by a clear methodological basis, an interdisciplinary approach and a combination of theory and practice, making them applicable in different contexts. The evaluation of these contributions confirms their significance and potential impact on the scientific community and practical applications.

I accept that the contributions proposed by Assoc. Prof. Irina Radeva correspond to the thematic scope of the competition and are significant enough for the academic position of Professor at the IICT-BAS.

Worldwide scientific databases provide the following information about Assoc. Prof. Irina Radeva, PhD:

- **Web of Science:** 13 Total Documents, 12 Web of Science Core Collection publications, 60 Sum of Times Cited, 54 Citing Art.s, **h-index 5**;
- **Scopus:** 30 Documents, 211 Citations, **h-index 9**;
- **Google Scholar:** Citations 502, **h-индекс 14**, i10-индекс 24;
- **Researchgate:** Research Interest Score 308.7, Citations 410, **h-index 13**.

The data provided by the various scientific databases show the activity and recognition of Assoc. Prof. Irina Radeva's scientific production at the international level.

Assoc. Prof. Irina Radeva, PhD, has participated in 18 national projects covering a wide range of topics. These include techno-economic studies for managing production and transportation systems, the development of models for evaluating investment attractiveness, the implementation of intelligent information technologies, and projects in the fields of security and healthcare.

She has also participated in 4 international projects, including those under the FP7 program and collaborations with research institutions in Slovakia and Poland. The topics include intelligent systems, probabilistic diagnostics, and applications of contemporary paradigms in computational technologies.

Assoc. Prof. Irina Radeva has led 7 national projects, which include the development of intelligent systems for managing agricultural processes, models for assessing investment attractiveness, and independent evaluations of projects related to transparency and business integrity.

Her work on these projects demonstrates a high level of scientific activity, encompassing both participation and

leadership in significant national and international initiatives. The project topics highlight an interdisciplinary approach aimed at solving practical and theoretical problems. This underscores the sustainable development of her scientific competencies and leadership skills in research activities.

7. Personal impressions of the candidate and recommendations

My personal impressions of Assoc. Prof. Irina Radeva are that she is an ambitious and thorough researcher with already considerable professional experience. This gives me reason to recommend submitting a monographic work in English on the problems of intelligent decentralized systems, strengthening independent publishing activity and expanding work with PhD students.

C O N C L U S I O N

In conclusion, I affirm that the documents and materials submitted for the competition by Assoc. Prof. Irina Radeva, PhD, present results that fully meet the comprehensive requirements for the academic position of "Professor," in accordance with the Act on the Development of the Academic Staff in the Republic of Bulgaria (ADSRB), the Regulations for its Implementation, the Regulations on the Conditions and Procedure for Acquiring Scientific Degrees and for Holding Academic Positions at the Bulgarian Academy of Sciences and the Regulations on the Specific Conditions for Acquiring Scientific Degrees and for Holding Academic Positions at the Institute of Information and Communication Technologies - BAS, in the professional field 4.6. "Informatics and Computer Science," specialty "Informatics (Blockchain Technologies and Models)."

I confidently give my positive evaluation and recommend that the Scientific Jury proposes to the Scientific Council of the Institute of Information and Communication Technologies - BAS to appoint Assoc. Prof. Irina Alexandrovna Radeva, PhD, to the academic position of "Professor" in the professional field 4.6. "Informatics and Computer Science", special. "Computer Science (Blockchain Technologies and Models)".

Sofia,
24.01.2025

Reviewer

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