REVIEW

by Prof. Maria Petkova Hristova, PhD

on the materials submitted for participation in a competition for the academic position of „Associate Professor“ at Varna Free University „Chernorizets Hrabar“, in the higher education area 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 Informatics and Computer Sciences

1. General Provisions of the Competition

By Order No. 605 dated September 30, 2026, issued by the Rector of VFU “Chernorizets Hrabar”, I have been appointed as a member of the Scientific Jury for the competition announced in the “State Gazette”, issue 69/July 31, 2026, and on the website of VFU, for the awarding of the academic position „Associate Professor“ at VFU in professional field 4.6 Informatics and Computer Sciences. This position is for the needs of the Department of Computer Sciences, Faculty of Social, Economic and Computer Sciences. By decision of the Scientific Jury at its meeting on October 7, 2026, I was selected as a reviewer. The review has been prepared based on the documents submitted for participation in the competition by the sole candidate – Dr. Ivan Stanimirov Stoyanov, and complies with the requirements of the Act on Development of the Academic Staff in the Republic of Korea (ADASRB), the Regulations for its implementation (RADASRB), and Ordinance No. 3 on the Academic Staff of Varna Free University „Chernorizets Hrabar“.

The set of materials presented by the candidate is in accordance with the aforementioned Ordinance No. 3 of VFU (Art. 19) and includes a total of 13 documents.

2. Brief Biographical Data of the Candidate in the Competition

Ivan Stanimirov Stoyanov holds a Bachelor's degree in Finance from the University of National and World Economy and a Master's degree in Software Technologies with a specialization in „Mobile Systems and Applications“ from Plovdiv University „Paisii Hilendarski“. During the period 2020–2023, he was a

doctoral student in the Informatics PhD program at the same university, where in 2023 he defended a dissertation on „Research on Creating a Virtual Operator in Smart Agriculture Infrastructure“ and acquired the educational and scientific degree of „Doctor“ (PhD) in professional field 4.6 Informatics and Computer Sciences.

Since 2021 Dr. Ivan Stoyanov has been working as a Chief Assistant Professor at the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences (IICT–BAS). His professional profile combines knowledge in finance, software technologies, and informatics, focusing on scientific research and the development of intelligent information systems. Since July 10, 2026, he has been a Chief Assistant Professor at the Department of Computer Sciences at VFU „Chernorizets Hrabar“. He is a member of the John Atanasoff Society of Automatics and Informatics (SAI). His scientific activity includes a total of 36 scientific publications and participation in 4 research projects.

3. General Description of the Submitted Materials

Dr. Ivan Stoyanov is participating in the competition for Associate Professor with 13 scientific works, including one collective monograph. The candidate's entire output is topically within the competition's professional field 4.6 Informatics and Computer Sciences. None of the publications have been submitted for the acquisition of the educational and scientific degree "Doctor" (PhD) or for occupying the academic position of "Chief Assistant Professor". No plagiarism has been discovered or proven according to the legally established procedure in the works submitted for evaluation. After reviewing the production in the competition and performing the necessary reference checks, I confirm this statement.

4. General Characteristics of the Candidate's Activity

4.1 Evaluation of the Candidate's Scientific and Applied Scientific Activity

For participation in the competition, the candidate has submitted one collective scientific book (monograph) and 12 scientific publications for the period from 2021 to 2026, including one report for which a document has been presented confirming it has been accepted and is forthcoming in the proceedings of IEEE Intelligent Systems IS'26, Varna, Bulgaria, September 3-5, 2026. Five publications are in journals, 6 are indexed in the Web of Science database, 6 are in Scopus, one has an SJR, three have an IF, two are in the Q1 quartile, one is in Q2, and one each in Q3 and Q4. The Scopus reference shows an h-index of 3 for the candidate.

The publications are in specialized scientific journals with international indexing such as: Future Internet (publications No. 6 and No. 7), TEM Journal (publication No. 10), and Mathematical Biosciences and Engineering (publication No. 11), as well as in international conference proceedings – BRAIN. Broad Research in Artificial Intelligence and Neuroscience (publication No. 4); publications No. 1, 2, 3, 5, 8, 9, and 12, presented in IEEE proceedings (International Conference on Big Data; Knowledge and Control Systems Engineering (BdKCSE), IEEE International Conference Automatics and Informatics – ICAI, Varna; IEEE Intelligent Systems IS'26, Varna, etc.). The presented publications have good international visibility.

All publications are in English and are co-authored. In two of the publications, the candidate is ranked first in the list of authors. No evidence has been presented regarding the distribution of authorship and individual scientific contribution; therefore, I assume that Dr. Ivan Stoyanov has an equal participation in the publications.

The candidate's presented scientific production is characterized by a diversity of research directions and an orientation towards the development and application of intelligent information systems. The main thematic areas are: smart agriculture and process modeling; expert systems for diagnosing poisoning in farm animals; logic programming and informatics education;

digitalization of cultural and historical heritage; monitoring of ambient air quality through agent-oriented and multi-agent platforms. The scientific activity of Dr. Ivan Stoyanov is characterized by steady participation in collective scientific, applied, and educational research in the field of information and communication technologies, artificial intelligence, modeling, and development of software platforms.

One collective scientific book (monograph) from 2024 is presented – "ARTIFICIAL INTELLIGENCE IN 24 … / book three, BAS Publishing House 'Prof. Marin Drinov', 2024, Sofia, ISBN: 978-619-245-470-8" with a volume of 804 pages, dedicated to machine learning, generative artificial intelligence, and the related fields of big data and blockchains. Dr. Ivan Stoyanov is the author of Chapter Two, “Introduction to Generative Artificial Intelligence” (126 pages), which covers the mathematical foundations of generative AI, basic methods, prompt engineering, autoencoders, generative adversarial networks, autoregressive models, and transformers.

Dr. Stoyanov has participated in the national scientific programs of the Ministry of Education and Science (MES) „Smart Agriculture“ (2020-2023) and „Smart Livestock Breeding: (2020-2023), a project for knowledge modeling in the field of Bulgarian folklore at the Scientific Research Fund at IICT of BAS, and a project for intelligent management of the Bulgarian plant gene pool stored in the genebank of IPGR – Sadovo, with the financial support of the Ministry of Education and Science.

4.2 Evaluation of the Candidate's Teaching and Pedagogical Activity

No information has been submitted regarding the candidate's teaching and pedagogical activity.

4.3 Regarding the fulfillment of the minimum national requirements by indicator groups for occupying the academic position of “Associate Professor” in professional field 4.6 Informatics and Computer Sciences (pursuant to Art.

2b, Para. 2 and 3 and Art. 29, Para. 5 of ADASRB), the following summaries can be made:

• For Group „A“: the candidate has presented Diploma No. 1000580 dated July 11, 2023, from PU “Paisii Hilendarski” for a defended dissertation for the awarding of the educational and scientific degree "Doctor" (PhD) – 50 points.

• For Group „B“: Habilitation thesis – scientific publications in editions that are refereed and indexed in world-renowned databases with scientific information (WoS and Scopus) pursuant to Art. 29, Para. 1, Item 3 of PURZAD, a collective monograph has been submitted: ARTIFICIAL INTELLIGENCE IN 24 … / book three, BAS Publishing House “Prof. Marin Drinov”, 2024, Sofia. Ivan Stoyanov is the author of Chapter Two, “Introduction to Generative Artificial Intelligence”. A total of 100 points are gathered for this group out of the required 100 points.

• For Group „C“ (Indicator G7): 12 scientific publications are presented, published mainly in editions indexed in Scopus and/or Web of Science (WoS). The total number of points for this indicator is 417, with a minimum requirement of 200 points.

• For Group „D“: the candidate reports 152 points (with a minimum requirement of 50 points). A list of 19 citations of Dr. Stoyanov's publications is presented. A technical error has been made here – the same citing publication: Najlae El Khammari, Rachid Hasnaoui, “Evaluation of the Impact of Educational Programs at Secondary School”, Educational Process: International Journal, 2025, DOI 10.22521of /edupij.2025.15.141 has been included twice within the same cited work, which leads to double counting of 8 points, i.e., the total number of points is reduced to 144.

All citations are made in scientific editions, monographs, and collective volumes refereed and indexed in world-renowned databases with scientific information (WoS and Scopus).

All indicator groups of the minimum national requirements are fulfilled, and for groups “C” and “D” they are significantly exceeded.

Regarding the fulfillment of the additional requirements of Ordinance No. 3 on the Academic Staff of VFU, Art. 18 (2) for candidates who have held a previous academic position at VFU, the following summary can be made, derived from the Reference submitted by the candidate and approved by the Head of the Department of Computer Sciences at VFU “Chernorizets Hrabar”:

• Chief Assistant Professor Dr. Ivan Stoyanov was appointed at VFU in July 2026 and was not evaluated (attested) during the period of submitting documents for the competition.

• After acquiring the academic position of “Chief Assistant Professor”: a) Chief Assistant Professor Dr. Ivan Stoyanov:

a) has publications in Scopus and WoS;

b) from the appointment of Chief Assistant Professor Dr. Ivan Stoyanov in July 2026 until the moment of applying for the competition, there have been no student performances/activities in the department;

c) he is registered for the academic position of “Chief Assistant Professor” by NACID (National Centre for Information and Documentation).

5. Main Scientific, Applied Scientific, and Applied Contributions

Based on the works of Dr. Ivan Stoyanov, several main directions of his scientific interests in modern fields of informatics can be distinguished. The scientific contributions in the candidate's output are manifested primarily in the development and application of models, methods, and architectures for intelligent information systems. The applied scientific value of the publications is expressed in the search for solutions to specific practical problems by integrating artificial intelligence methods, knowledge modeling, and heterogeneous data processing. The applied aspects are related to the development of software platforms, prototypes, and tools to support decision-making in various fields. The scientific, applied scientific, and applied

contributions can be classified by thematic areas and research methods as follows:

• ***Event-driven model and modeling of intelligent systems***

This area is leading in the candidate's scientific activity and is characterized by the creation and development of an event-driven model for the representation and interpretation of processes in various subject domains. Contributions include: formalization of events and their dependencies, adaptation of the model to tasks in agriculture and air quality monitoring,–, as well as its implementation in the ECOS multi-agent environment. The proposed concept of an abstract Event Engine for incident event detection and the use of cellular automata extend the research toward incident event recognition.

This direction has an original scientific contribution with potential for broad application in various subject domains.

• ***Knowledge-based systems***

In this direction, applied scientific and applied contributions stand out, related to the development of applied architectures combining semantic networks, frames, production rules, ontologies, and logic programming for knowledge representation and processing in specialized subject domains. The developments show a variety of applications of knowledge-based systems. Among them are a distributed knowledge base in ViSMod using semantic networks, frames, and rules at the object and meta-level, with predicates in SWI-Prolog and an inheritance mechanism; diagnosis of poisoning in farm animals, knowledge representation for air quality, digitalization of cultural heritage, and logic programming with Prolog as the main tool for knowledge representation and logical inference in educational and applied contexts.

• ***Intelligent assistants and agent-oriented systems***

Contributions in this field consist of the development and application of architectures for intelligent assistants that utilize knowledge representation, logical inference, autonomous behavior, and interaction between agents. The

creation of a general model for personalized intelligent assistants, applicable in various intelligent platforms, and the integration of symbolic and generative AI by combining classical BDI agents with ReAct agents based on large language models are contributions that can be evaluated as applied scientific. The applied universality of the general agent architecture lies in its use in various contexts for: preliminary and differential diagnosis of poisoning in animals, irrigation management, air quality monitoring, and a tourist guide for cultural and historical heritage with Guide and Planner agents. The cross-platform interaction, achieved through the use of FIPA-ACL and Contract Net protocols for message exchange and negotiation between agents, demonstrates systemic integration.

• ***Artificial Intelligence education in secondary school***

This direction carries scientific-methodological and educational-applied contributions. A methodology for teaching artificial intelligence in secondary school has been developed, based on the symbolic approach to AI, logic programming with Prolog, STEM tasks, and project-based learning. Teaching materials, curricula, and STEM activities for introducing logic programming and AI in secondary education have been developed and tested. Data from real practice for implementation and approval are provided: training of 115 students, evaluation of seven competencies in 53 students, and participation in the national initiative “Digital Bulgaria in Prolog” for modeling Bulgarian folklore, history, and heritage through Prolog projects. The contributions are contained in works.

• ***Generative Artificial Intelligence***

Knowledge of modern models and methods of generative artificial intelligence is systematized in a separate chapter of a collective monograph, which represents a scientific-educational contribution.

6. Reflection of the Candidate's Scientific Publications in National and International Scientific Literature

Chief Assistant Professor Dr. Ivan Stoyanov has presented a list of 19 identified citations in scientific editions and collective volumes refereed and indexed in world-renowned scientific information databases for a total of 8 of his publications. A large part of the citations were made by foreign scientists in prestigious journals and conference proceedings, such as: International Conference on Intelligent Communication, Sensing and Electromagnetics (ICSE), Guangzhou, China; International Journal of STEM Education; Knowledge Creation and Sharing for Social and Economic Development; International Journal of Education in Mathematics, Science and Technology (IJEMST), etc. This is additional evidence of the high professional level of the developments and their international visibility.

7. Critical Remarks and Recommendations

Along with the positive evaluation of the scientific activity of the candidate Dr. Ivan Stoyanov, several remarks and recommendations can be made:

• In the “List of Contributions” section of the description of the first research area, the concept of the Event Engine and its formalization using cellular automata are attributed to publication [13]. However, in the list of publications provided, [13] refers to the dissertation from 2023.

• The candidate does not have proven experience as a university lecturer, and it will be necessary to make efforts toward his methodological training and academic activity;

• It is recommended that publications state more clearly and precisely what is new in the approaches used and the results achieved compared to known solutions and alternative methods. In this way, their efficiency will be proven more distinctly and convincingly, and the claimed contributions will be better differentiated.

8. Personal Impressions

My impressions of Dr. Ivan Stoyanov are from his participation in a competition for a Chief Assistant Professor position in professional field 4.6 Informatics and Computer Sciences at IICT, BAS. As a member of the jury during that procedure, I can state that I was impressed by his good professional training, his drive toward the practical applicability of results, and his readiness to work in an interdisciplinary environment.

CONCLUSION

The results achieved by Dr. Ivan Stoyanov in his research activity are related to problems and specific tasks within the scope of the announced competition and characterize the candidate as a scientist with high professional qualifications. The results fully comply with the requirements of the ADASRB, the Regulations for its implementation, and the additional requirements of VFU “Chernorizets Hrabar” for occupying the academic position of "Associate Professor" in professional field 4.6.

All of the above gives me reason to give my entirely positive evaluation of the submitted materials, and I propose to the Scientific Council of VFU “Chernorizets Hrabar” that Dr. Ivan Stanimirov Stoyanov be elected to the academic position of “Associate Professor” at VFU “Chernorizets Hrabar” in professional field 4.6 Informatics and Computer Sciences, higher education area 4. Natural Sciences, Mathematics and Informatics.



October 25, 2026 Reviewer:
Sofia /Prof. Maria Hristova, PhD/