REVIEW

for the competition for the academic position of „Associate Professor“ in the professional field 5.2 "Electrical Engineering, Electronics and Automation", scientific specialty "Application of the Principles and Methods of Cybernetics in Various Fields of Science", announced in State Gazette No. 105/13.12.2024 for the needs of the Department of Cyber-Physical Systems at the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences (IICT-BAS) with a candidate: **Chief Assistant Dr. Stanislav Dimitrov Dimitrov**

by prof. Vera Angelova-Dimitrova, IICT-BAS

By order No. 35/12.02.2025 of the Director of IICT-BAS, issued on the basis of a decision of the Scientific Council of IICT-BAS, Protocol No. 1/24.01.2025, I am appointed as a member of the scientific jury in a competition for the academic position of "Associate Professor" in the professional field 5.2 "Electrical Engineering, Electronics and Automation", scientific specialty "Application of the principles and methods of cybernetics in various fields of science", for the needs of the Department of Cyber-Physical Systems of IICT-BAS. Only one candidate has submitted documents for the announced competition – Ch. Assist. Dr. Stanislav Dimitrov Dimitrov.

1. Bibliographic data and general description of the presented materials

Ch. Assistant Dr. Stanislav Dimitrov Dimitrov graduated with a Bachelor's degree in Automation and Information Technologies from the University of Chemical Technology and Metallurgy, Sofia in 2008 and a Master's degree in Information Technologies in 2010 from the same university. Since 2009, he has been working as a programmer at IICT-BAS, where in 2014, he defended his PhD thesis in the professional field 5.2 "Electrical Engineering, Electronics and Automation. Since 2019 he has been a Chief Assistant at the Institute.

For participation in the competition, Ch. Assist. Dr. Stanislav Dimitrov Dimitrov has submitted the following documents:

1. Curriculum vitae according to the European model
2. Copy of diploma for PhD degree
3. Official note for internship in the specialty
4. List of articles submitted by the candidate for the PhD degree
5. List of scientific publications for participation in the competition, which do not repeat those submitted for the acquisition of the PhD degree
6. List of citations for participation in the competition
7. Abstracts of the scientific publications for participation in the competition - in Bulgarian and in English
8. Copies of scientific publications for participation in the competition
9. Information on the fulfillment of the minimum requirements of IICT
10. Information on the fulfillment of the minimum requirements of NACID
11. Information on the original scientific and applied contributions of the candidate
12. Declaration for the absence of plagiarism in scientific papers proven by law

13. Electronic media with information, according to the requirements of IICT-BAS

The candidate participated in the competition with 31 scientific publications that did not repeat the publications participating in the procedure for acquiring the PhD degree and a list of 12 citations. Of the publications submitted for participation in the competition, 6 are published in journals and series [B4.2, B4.9, B4.10; D7.3; D8.7, D8.8], 25 are reports in preprints of scientific forums [B4.1, B4.2, B4.4 – B4.8; D7.1, D7.2, D7.4 – D7.9; D8-1 – D8.6, D9.9 – D8.12]; 18 of the publications are in journals that are refereed and indexed in world scientific databases [B4.1 – B4.9, D7.1 – D7.9] and 13 are scientific publications in non-refereed journals with scientific peer review or in edited collective volumes. One of the publications [B4.9] is in a journal of category Q1 of Web of Science (Mathematics, MDPI), and one [D7.3] is in a journal of category Q2 [Heliyon, Elsevier]. The indexing in Scopus of a publication [B4.10] in WSEAS Transactions on Business and Economics is a justified legal expectation, based on the established practice in historical terms, but until the time of the competition it is not visible in the world scientific databases, which is why I accept its status as a scientific publication in non-refereed journals with scientific peer review or in edited collective volumes. To fulfill the requirement of the Regulation for implementation of the LDAS in Republic of Bulgaria for indicator B4 Habilitation work – scientific publications (not less than 10) in journals that are refereed and indexed in world scientific databases, in indicator B4 I include publication [D7.3] instead of [B4.10] and correct the number of points (see Table 1). The correction made ensures compliance with the law. All publications of the competition are presented in full text.

2. Fulfillment of the requirements of Art. 53, para. 1 of the Regulation for the implementation of the LDAS in the Republic of Bulgaria

a) Points 1 and 2

Ch. Assist. Dr. Stanislav Dimitrov Dimitrov defended his PhD in the professional field 5.2 "Electrical Engineering, Electronics and Automation" in 2014 at IICT-BAS According to the official note presented in the competition documents, Ch. Assist. Dr. Stanislav Dimitrov Dimitrov has 16 years of work experience at IICT-BAS, including 5 years and 4 months in the academic position of Chief Assistant.

b) Points 3 and 4

The List of scientific publications submitted by the candidate for participation in the competition, which do not repeat the submitted for the acquisition of the PhD degree and the Articles submitted by the candidate for the acquisition of the PhD degree show that the scientific publications submitted for participation in the competition do not repeat the presented for the acquisition of the PhD degree. The candidate works mainly in a team. Four of the publications are independent, the remaining 27 are co-authored. The candidate has not submitted protocols for scientific contributions between the authors of the publications. Therefore, in accordance with the Regulations for the Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria (RILDASRB), I acknowledge the equal participation of all authors.

In the report on the fulfillment of the minimum national requirements and the

minimum requirements of IICT-BAS, are indicated 12 and are counted 11 citations in scientific journals, refereed and indexed in world scientific databases. The not counted citation is from an unrefereed journal with scientific peer review.

Ch. Assist. Dr. Stanislav Dimitrov Dimitrov fulfills the minimum requirements of IICT-BAS for the academic position of Associate Professor in all indicators:

Indicator group	Minimum NACID required	Required minimum IICT-BAS	Submitted for participation in the competition	Adjusted number of points
В	50	50	50	50
Г	100	100	290	300
Д	200	220	235	223,33
Е	50	60	120	123
Ё	-	20	50	50

Table 1. Number of points by indicators

c) Point 5

Ch. Assist. Dr. Stanislav Dimitrov Dimitrov does not have plagiarism in scientific papers proven by law.

3. Evaluation of the scientific and applied activity of the candidate and contributions to the materials submitted for review

The scientific interests of Chief Assist. Dr. Stanislav Dimitrov Dimitrov are in the field of analysis, synthesis, modeling, optimization, application of information technologies for intelligent management of transport networks and systems, complex systems (agriculture); implementation of innovations and technological resources in education through the integration of ICT tools and educational games into traditional classroom practices. The publications for participation in the competition present results in the field of synthesis of optimal systems and networks (information, transport); optimal management of resources and processes, inventory management in complex systems (agriculture, auto spare parts, commercial sites, furniture industry); intelligent management of distributed information systems; risk analysis and forecasting in agriculture; quantitative analysis and model of the efficiency and financial situation of a livestock farm; research and evaluation of STEM education and the application of information and communication technologies in education.

I accept the claims for scientific and applied scientific contributions of the candidate:

Scientific contributions: modeling and synthesis of optimal management of complex networks and systems. Models for optimization of transport traffic management, financial management, and management of resources in an commercial sites are proposed.

The following have been developed:

- two-level optimization model [B4.1] with two control variables – green light duration and cycle duration [B4.2] for 8 intersections with high traffic intensity [B4.3], achieving optimal values simultaneously for two driving goals - minimum queue length and maximum traffic intensity. The proposed approach enables a more detailed presentation of the problem under study by satisfying additional constraints in the optimization task. The effectiveness of the approach in terms of total queue length in the road network is superior to the results obtained in nonlinear programming [B4.2].
- single-purpose optimization model for control of cycle length and phase length of light signals of two independent traffic lights [B4.5]
- Model for determining the optimal quantities in the management of stocks [B4.7, D7.1] and stored products [D8.3]
- mathematical model for determining the necessary quantities of components for the composition of food mixtures with rational use of raw materials and achieving the lowest cost [B4.8]
- mathematical model for evaluating fuel offers depending on the price discount granted [D8.2]

Applied scientific contributions: Intelligent solutions for optimal management of transport traffic, agriculture; risk management, demand forecasting; the state and attitudes regarding the application of information and communication technologies in the modern educational process are studied:

- Improving the efficiency of transport systems by
    - optimization of network traffic light timing settings [B4.4] to achieve the most efficient control method
    - phase duration optimization and synchronization through intelligent traffic management methods [B4.5]
    - optimal allocation of resources through mixed-integer linear programming [B4.6]. An algorithm for finding the optimal distribution of vehicles and drivers in Sofia Electric Transport AD has been proposed
- Model and system for optimal management of resources in agricultural and industrial farms
    - Internet-based application of an information advisory module for management of food supplements on a farm [B4.7, D8.6], based on the developed model for optimal management of the stock of the most commonly used food supplements
    - optimal ruminant feeding strategy [B4.9]
    - stocks in pig farms [Y7.1, Y8.1 – Y.8.2], furniture industry [Y8.3], auto parts [Y8.7]
    - automated system for counting, feeding, water supply and maintaining optimal temperature in a livestock farm [G7.4]
    - farm products demand forecasting information system module [G7.5]
    - cost optimization through analysis of financial and business risk indicators

[B4.10, D7.2, D7.3, D8.4, D8.5, D8.8]

- Application of Information and Communication Technologies in Education
  - Study of the current state and attitudes to develop strategies for successful implementation of innovations and technological resources in education [G7.6 - D7.9, D8.9 - D8.12]

The claims formulated by the candidate for scientific and applied scientific contributions are justified and correspond to the results achieved. The effectiveness of the proposed models and solutions, the developed systems and the conducted studies and analyses, as described in the scientific publications submitted for the competition, show a high level of knowledge of Ch. Assist. Dr. Stanislav Dimitrov Dimitrov on the theoretical basis in the field of modeling, analysis, optimization and control, linear programming; free use of the possibilities for application of information technologies for intelligent management of complex systems and networks, analysis and development of innovative approaches to training.

In the Report on the fulfillment of the minimum requirements of IICT-BAS, Ch. Assist. Dr. Stanislav Dimitrov Dimitrov has declared participation in 5 national projects.

4. Reflection of the candidate's scientific publications in the scientific community (famous citations)

In the scientific database Scopus, Ch. Assist. Dr. Stanislav Dimitrov Dimitrov has an h-index of 3, which is a good result for visibility for his position in the world scientific community. The candidate has attached to the competition documents a list of 36 independent citations in world scientific databases, comprising 8 publications and 3 citations in non-refereed journals with scientific peer review of 3 publications. This is a good attestation to the visibility and evaluation of the results achieved by the candidate.

5. Significance of contributions to science and practice

All scientific publications submitted for the competition have been reviewed by independent reviewers, which confirms the reliability of the results presented in them. The reference to independent citations serves as evidence of the recognition of the candidate's results as significant among scientific circles in Bulgaria and abroad.

I accept the candidate's claims for results of a contributing nature. The results obtained are concrete and practically applicable and confirm the importance of the applicant's contributions.

6. Personal impressions and opinion of the reviewer

In the documents submitted for the competition, an impression is made by the carefully and skillfully prepared Reference for Original Scientific and Applied Scientific Contributions and Summaries of Scientific Publications in contrast to the inaccuracies in the Reference for the fulfillment of the minimum requirements of IICT for Associate Professor and Reference for registration in NACID. Ch. Assist. Dr. Stanislav Dimitrov enjoys the opinion of established scientists at the Institute as diligent and responsible in the implementation of scientific challenges and projects. The candidate has published significant

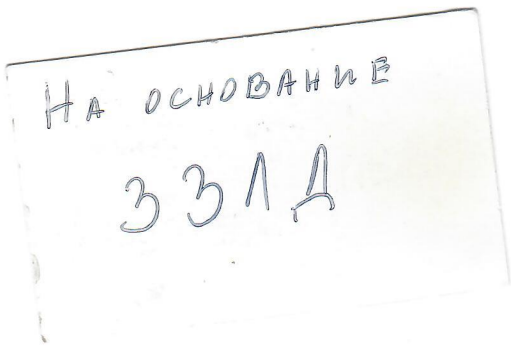
scientific work on the competition's problems, presented at prominent scientific forums, and published in prestigious journals. Ch. Assist. Stanislav Dimitrov Dimitrov shows a high degree of competence in the issues of the competition and teamwork skills.

7. Critical notes and recommendations

I have no critical remarks or recommendations.

8. Conclusion

All requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for the Implementation of the Academic Staff Development Act in the Republic of Bulgaria, the Regulations on the Terms and Conditions for the Acquisition of Scientific Degrees and Academic Positions in the Bulgarian Academy of Sciences and the Regulations on the Specific Conditions for Acquiring Scientific Degrees and Occupying Academic Positions at IICT-BAS have been fulfilled. Based on the presented documents and scientific papers, as well as the analysis of their significance and the results contained therein of a contributing nature, I give a positive conclusion for the selection of Ch. Assist. Dr. Stanislav Dimitrov, PhD, to the academic position of Associate Professor at IICT-BAS and I recommend to the Scientific Jury to propose to the Scientific Council of IICT-BAS Ch. Assistant Dr. Stanislav Dimitrov Dimitrov for the election to the academic position of Associate Professor for the needs of the Department of Cyber-Physical Systems at IICT-BAS, in the professional field 5.2 "Electrical Engineering, Electronics and Automation", scientific specialty "Application of the Principles and Methods of Cybernetics in Various Fields of Science".



02/04/2025 Reviewer:
Sofia