

REVIEW



For procedure for academic position “**associated professor**”

domain of High education: **5. “Technical Sciences”**,

professional field of study: **5.2 „Electrical engineering, Electronics and Automatics“**

scientific specialty: **„Application of the principles and methods of cybernetics in different domains of science (technical sciences) ”**

for the needs of the department **“Cyber-physical systems”**

The competition is published in “State newspaper” N57/9 July 2021 for the needs of Institute of Information and Communication Technologies – Bulgarian Academy of Sciences (IICT-BAS)

with candidate: **chief assistant Ph.D. Denis Safidinov Chikurtev** from Institute of Information and Communication Technologies – Bulgarian Academy of Sciences

Member of the jury: prof. D.Sc., Ph.D. Eng. **Todor Atanasov Stoilov** , Institute of information and communication technologies – Bulgarian Academy of Sciences, Sofia, Acad.G.Bontchev str., BL.2

I. Common biographical data of the candidate

Main data about the education and for his scientific degree and academic position of the candidate are summarized in Table1

Table 1.

Name	Burth date	Higher education	Scientific degree Dr.	Chief assistant
Denis Safidinov Chikurtev	19.01. 1990г.	2012-2014 Master degree, Automation, information and control technic, Technical University - Sofia 2008-2012 Bachelor, Automation, information and control technic, Technical University - Sofia	2017 г. – IICT-BAS	2019г. – IICT- BAS

Denis Chikurtev graduated from the Technical University of Sofia with a bachelor's and master's degree. He graduated as a master in 2014 with a specialty "Automation, information and control technology". He started his career in 2012 at the Institute of System Engineering and Robotics - BAS. Since 2015 entered the Institute of Information and Communication Technologies - BAS, where he currently works. He was appointed to the positions of computer operator and assistant.

In 2014 is enrolled in doctoral studies. He defended his scientific degree "Doctor" in 2017 on "Research and control of service robots for helping human".

From 2019, he has been appointed as an assistant professor. He is currently working in the Cyber-Physical Systems Section of IICT-BAS.

II. General characteristics of the research and scientific-applied activity of the candidate

The submitted works for the competition for "associate professor" are systematized according to ZRAS, PPZRAS. The specific requirements in IICT-BAS are higher in comparison with the legally defined ones in ZRAS and PPZRAS. Therefore, the review compares the personal points of the candidate on the individual indicators and those required by IICT-BAS.

The candidate submits a list of 37 scientific publications for participation in the competition in the document "List of publications for participation in the competition for the academic position" Associate Professor ".

In the document, "REFERENCE for fulfillment of the minimum requirements of IICT for the academic position of associate professor" the candidate includes all these scientific publications, dividing them respectively into categories B and D of the reference for minimum requirements. All 37 publications submitted for participation in the competition are presented and numbered in a separate list.

The candidate has also declared participation in scientific and applied research projects. The reviewer does not find in the submitted materials of the competition evidence for participation and management of these scientific and scientific-applied projects.

Indicator group A: diploma for awarding an educational and scientific degree "doctor" on the topic "Research and control of service robots for helping human". The applicant satisfies the requirement of this indicator.

Indicator group B: the requirement is to collect 100 points through habilitation work or scientific publications (not less than 10) in publications, referenced and indexed in world-recognised databases. The candidate satisfies the requirement of this indicator with ten scientific publications. Publications have been made at scientific conferences included in specialized publications and editions (IFAC Papers online, IEEE Xplore, Mechanisms and Machine Science, World Symposium on Digital Intelligence for Systems and Machines, International Conference on Mechanical Technologies and Structural Materials, International Conference on Emerging eLearning Technologies and Applications, IEEE International Scientific Conference Electronics.

The presented data for indicator B contain complete bibliographic data with included virtual links for verification of these publications. This is an advantage of the prepared document.

The candidate has correctly calculated his result of 131.5 points. This result exceeds the legally required level of 100 points. The reviewer considers that the candidate meets the legal requirements for this indicator.

Indicator group Γ requires a collection of 220 points. The candidate submits a list of 27 scientific publications in the Γ7 and Γ8 categories. Category Γ7 is for scientific publications in editions that are referenced and indexed in world-recognized databases of scientific information. The candidate presents eight titles.

Publications have been made in specialized proceedings published within international scientific conferences (International Conference on Robotics in Alpe-Adria Danube Region, International Conference on Emerging eLearning Technologies and Applications, International Conference on Control, Decision and Information Technologies, IFAC-PapersOnLine, Mechanisms and Machine Science, IEEE, IOP).

In category Γ8: Scientific publications in non-refereed journals with scientific review or in edited collective volumes, the candidate presents 19 scientific publications. They have been made in journals (Problems of Engineering Cybernetics and Robotics - Bulgaria; Proceedings of the Technical University of Sofia; Industry 4.0 - Bulgaria), at scientific conferences (Automation of Discrete Manufacturing; Automatics and Informatics; Robotics, Automation and Mechatronics).

The presented data for indicator Γ contain complete bibliographic data. The candidate has calculated his results on 236.9. The reviewer considers that the candidate has calculated his points correctly.

The reviewer accepts that the publications submitted for participation in the competition meet the requirements of indicator Γ.

Indicator group Δ requires 60 points: citations in scientific journals referenced and indexed in world-recognized databases and/or scientific reviews. The candidate submits a list of 13 citations. He has calculated that 81 points are collected on this indicator. The reviewer has checked the submitted data to reach the required level of 60 points. It is evident from the submitted materials that the applicant has exceeded this requirement.

The reviewer assumes that the data submitted for citation in the competition meet the requirements of indicator group Γ.

Indicator group E: participation in projects. The applicant has submitted a list of projects in which he has participated and/or managed. The projects are presented by names of scientific and economic contracts. They are funded by the Operational Program "Innovation and Competitiveness", the Bulgarian Scientific Fund, as well as in an international agreement funded by the European Commission (ACOMIN). The candidate has also managed a contract funded by BAS under a program to support young scientists. A financial contribution of BGN 10,000 was also declared, but no evidence was attached.

The requirements for this indicator are for 20 points. The candidate has calculated his participation at 62 points. The reviewer checked the result to the required minimum. It is evident from the submitted materials that this requirement has been exceeded by the applicant.

The reviewer accepts that the data presented in the competition meet the requirements of indicator E.

The conclusion of the reviewer is that the candidate satisfies all indicators groups and he exceeds the required levels with his declared scientific production and scientific-applied activity. The reviewer did not calculate the declared levels for the individual groups of indicators, but only checked the achievement of the required legislative scores.

II. Assessment of the pedagogical activities of the candidate

The candidate works on a position of chief assistant professor at an academic institute of Bulgarian Academy of Sciences. The main activity in such an academic institute is research and applied science. Pedagogical training and activity of the candidate is not required for his current research position.

The candidate's CV does not contain data on personal pedagogical training and activity.

III. Main research and experimental achievements

The candidate submits a list of 37 scientific publications for this competition. In the attached documents, "List of publications" and "REFERENCE for fulfillment of the minimum requirements of IICT for the academic position of associate professor" are presented 37 titles. The candidate has also submitted his Doctoral thesis abstract to show that the publications presented in this competition have not been used by previous procedures. Electronic versions of all publications are presented in the attached documents for the competition.

The main scientific and scientific-applied contributions of the candidate, which are presented in the publications of the competition, refer to the scientific field of "automation". The object of research is a robotic platform to be applied for practical activities such as transport, manipulator, and discrete automated production. The topics of scientific publications can be conditionally classified as:

- Development of problems related to the technical construction and application of robotic platforms;
- Development of problems related to control and automation of activities related to the application of robotic platforms.

In the class of problems belonging to the first thematic group, technical means have been developed such as interfaces between robotic components and systems, means of communication, coordination of the interaction between human and robot. A specific development is the application of a graphical interface for robot control.

In the class of problems belonging to the second thematic group, control algorithms for manipulator have been developed; processing of visual information during navigation of a transport robot; design of control system with state feedback and/or operating indicators, remote control of a robot in an environment inaccessible to humans.

The reviewer assesses that scientific contributions concern the development of algorithms for controlling and supervising a transport robot, using data from visual information. This allows the robotic system autonomously and automatically to

perform independent navigation in an obstacle environments. Thus, an independent operation of the transportation robot is implemented for every given transportation task.

These researches have been applied for a set of problems that concern improvement and maintenance of quality of life of adults and/or disabled people.

The candidate has also worked on issues addressing heat distribution in buildings, assessment of fragmentation in ball mills, the impact of a moving train on rails, generation of 3D images from set of sensors information. These results are presented in scientific publications in journals in Bulgaria and at international conferences.

The reviewer considers that scientific and applied contributions are contained in the publications, which address the development of methods and tools for automated and automatic operation of robotic systems. The developed technical means and control algorithms are applied in practical tasks and applications.

The reviewer believes that the candidate's publications present good examples of implemented scientific and applied engineering solutions.

IV. Significance of the contributions for the science and practice

The referee assesses that in the researches of the candidate it is evident the will for the design and implementation of different tools and algorithms for controlling robotic systems in real practical engineering solutions. In the candidates documents there are given data about participation in an international research project, leadership in projects, projects funded by the Bulgarian Research Fund. This is an indirect prove for the utility, usefulness and significance of the practical contributions of the candidate.

V. Critical remarks and recommendations

The reviewer doesn't have critical opinion towards the content of the presented documents for this procedure. Here are discussed few subjective assessments, which are not obligatory to be considered by the candidate.

I recommend the candidate in his future activities to limit the number of coauthors in his publication activities.

It is necessary to be provided appropriate documents to proof the project results and funds, which results from the candidate's participation in the projects and his activities.

These assessments from the reviewer don't concern the content and the significance of the results, obtained by the candidate. They are not mandatory, but reflect the specific personal opinion of the reviewer.

The documents prepared for the competition are very well prepared. They are easy to process and do not create difficulties in assessing the results obtained by the candidate.

Conclusion

The candidate in this competition **chief assistant Ph.D. Denis Safidinov Chikurtev** is presented with enough set of research works. In the candidate's works there are original research and practical contributions.

I find that the legislative requirements of The Law for academic promotion and The Rules for the application of this law and the internal rules IICT-BAS are satisfied. All upper said and after my acquaintance with the presented documents and their contributions with research and practical results give me ground to suggest **chief assistant PhD Denis Safidinov Chikurtev** to take the academic position "**associated professor**" in IICT-BAS, department "Cyber-physical systems" for the professional field of study: 5.2 „**Electrical engineering, Electronics and Automatics**“, scientific specialty: „**Application of the principles and methods of cybernetics in different domains of science (technical sciences)**”.

14.10.2021

Reviewer:



Prof. DSc Todor Stoilov