STATEMENT

in a competition for the academic position of "professor" in professional management 5.2. Electrical engineering, electronics and automation, specialization "Robots and manipulators", announced in SG no. 21 of 15.03.2022 for the needs of the section Cyber-physical systems
candidate: Assoc. Prof. Dr. Naiden Nedkov Shivarov
Member of the Scientific Jury: Prof. Dr. Kostadin Kostadinov, BAS
Grounds for the position: Order of the Director of IICT-BAS № 133 / 13.5.2022

1. General information and biographical data

The only candidate in the competition is Assoc. Prof. Naiden Nedkov Shivarov. He was born on October 27, 1973 in the city of Sofia. He graduated from the University of Forestry and Technology - Sofia in 1997 as an engineer (master), majoring in "Mechanization of the Forest Industry". He defended his doctoral dissertation in 2001 at the Vienna University of Technology - Institute of Robotics, on "A set of robot tools for modular mobile robots." From 2012 to 2014 he was an "associate professor" at ISIR-BAS, from 2015 he was an "associate professor" at the European Polytechnic University. Since 2019 he has been an associate professor at IICT-BAS, and since 2020 he has been the head of the Cyber-Physical Systems Section at IICT-BAS. The professional and organizational activity of the candidate is determined by the fact that from 2019 until now Assoc. Prof. Shivarov has been the author and / or co-author of 34 publications on the topic of the competition, of which 24 SCOPUS referred (one with impact factor and 10 with SJR) and a published monograph that is not presented as a major habilitation thesis. 17 citations in SCOPUS are presented. The applicant manages 2 international projects and participates in one international and 2 national projects. He is a member of the Technical Committee 9.5 of IFAC and the Bulgarian Robotics Society. The applicant is the inventor of Patent №66853 "Autonomous Personal Service Mobile Robot".

2. General description of the submitted materials

In the competition for "professor", Assoc. Prof. Dr. Naiden Nedkov Shivarov participated with a list of 10. scientific papers of a monographic nature in publications that are referenced and indexed in the world-famous database of scientific information - Scopus, according to Article 24, paragraph 1, item 3 of the Act. No unifying title specified. The works are in the field of "Service robots to support the elderly and disabled and for storage and delivery of finished products, training robots for STEM training and cyber-physical systems for intelligent control and monitoring." Of these, 1 is independent, 1 with 2 co-authors, 5 with 5 co-authors, 2 with 6 co-authors, and 1 with 7 co-authors, some of them, scientists from abroad, members of the project consortia: "Network of ICT Clubs in Robotics "-1 2020-1-BG01-KA202-079200, ERASMUS + and" Cyber-physical system for intelligent surveillance and telemedicine for patients with COVID-19 "IC-SK / 01 / 2021-2022, EBR Bulgaria - Slovakia.

There is also a list of 24 publications other than those for indicator B. Of which one published monograph, which is not presented as a major habilitation thesis, 13 are articles in publications that are referenced and indexed in the world-famous database of scientific information - Scopus. Of these, 2 have 2 co-authors, 1 has 3 co-authors, 9 has 4 co-authors and 1 has 6 co-authors. The other 10 are in unreferenced journals with scientific review or in edited collective volumes, 3 of which are independent. 10 of the publications with the participation of Assoc. Prof. Shivarov are with SJR, and one has an impact factor.

A list of a total of 17 citations of a total of 9 articles is presented, as all citations are in publications that are referenced and indexed in the world-famous database of scientific information - Scopus.

The applicant has also submitted a list of 6 international and national projects with his participation as a member of the team: 1 under the Erasmus program of which he is coordinator, 1 under the EBRD as coordinator, 1 under H2020 in which he is a participant, 1 under NSF in which he is a participant, 1 under the NNP "Intelligent Animal Husbandry" as a manager of work packages 6 and 8 and 1 under the NSF as a manager.

A document for protection of intellectual property rights is also presented - Patent for invention № 66853 B1 "Autonomous Personal Service Mobile Robot", Inventor: Naiden Shivarov.

The structural characteristics of scientific papes give grounds for the following conclusions and assessments:

- The presented works are dedicated to problem-oriented research in the field of competition.
- The candidate participates in the competition for "professor" with a sufficient number of papers, fulfilling the requirements of the law and the additional requirements of IICT-BAS.

• There are both independent and co-authored scientific papers, which shows the ability to work both as a team and independently.

3. General characteristics of the candidate's research and applied research activity

Of the presented 10 main publications with a monographic character and 1 + 13 + 10 other paper / reports, Assoc. Prof. Nayden Shivarov is an independent author in a monograph, which is not presented as a major habilitation thesis, in 4 articles, and in other 8 SCOPUS referenced papers - author. The publications are on the topic of the competition. The paperss and reports address the following research topics:

1. Service robots to support the elderly and disabled articles № 1, 3, 17, 22 29, 33
2. Training robots for STEM education in Bulgarian schools, articles № 6,8,11.
3. Cyber-physical systems for intelligent management of animal husbandry complexes, articles № 20, 24
4. Cyber-physical systems for remote monitoring and tele-medical examinations in hospital care, articles № 7, 10, 23, 30
5. Service robots for storage and delivery of finished products, articles № 9, 12, 13, 14, 15, 25, 26
6. Specialized gripper-dispenser for dosing of a laboratory mill with grinding bodies, articles № 5, 18.
7. SCARA type manipulator for rehabilitation of upper limbs, articles №4, 34
8. Algorithms using artificial intelligence for automatic recognition of faces and objects, articles № 19

4. Research and applied contributions of the candidate

I accept as justified, substantiated and confirmed by the scientific papers (articles and reports) with which the candidate participates in the competition for "professor", several groups of contributions in different fields, which can be combined as follows:

- Service robots for storage and delivery of finished products have been developed, prototyped and tested; to improve the quality of life of people with disabilities; and for the development of STEM education in Bulgarian schools,
- Cyber-physical systems (CFS) have been developed for intelligent management of animal husbandry complexes and for remote monitoring and tele-medical examinations in hospital care,
- developed and implemented algorithms using artificial intelligence for automatic recognition of faces and objects,
- developed constructions and researched: Manipulator type SCARA for rehabilitation and specialized gripper - dispenser for dosing,

I consider the contributions to be mainly of a scientific and applied nature. There are scientific and / or applied elements in separate contributions.

I evaluate the candidate's contributions positively and as corresponding to the requirements of the normative documents.

5. Significance of contributions to science and practice

The presented scientific and applied contributions of the candidate have an extremely great industrial and social significance. Developed, researched and prototyped service robots are essential for the development and enrichment of the theory and practice of high-tech robotic systems to support the elderly and disabled, for transport and delivery of finished products and for STEM training of students. The developed cyber-physical systems provide complex intelligent management of smart buildings and remote monitoring and tele-medical examinations in hospitals.

In addition to 10 monographic publications, Assoc. Prof. Nayden Shivarov presented a monograph, which is not presented as a major habilitation thesis, 13 articles on indicator D referred to in SCOPUS and 10 other articles / reports in Bulgarian publications. Lists of citations, projects and patents are presented. The candidate's dissertation is defended at the Vienna University of Technology and approved in Bulgaria by the Higher Attestation Commission. In 2021 the candidate was awarded the annual award of Plovdiv Tech Park for his contribution to the development of Information Technology and Robotics for the benefit of society. I am convinced that the contributions of Assoc. Prof. Naiden Shivarov have received the necessary wide fame and recognition from the scientific community.

6. Critical remarks and recommendations

I have no critical remarks with which to challenge the main scientific and applied contributions of the candidate. The high level of some of the obtained results has enabled their publication and citation in publications with

impact factor, SJR and protection of intellectual property rights with a patent: Autonomous Personal Service Mobile Robot. I would recommend wider participation in research projects on the subject of the competition as a project manager.
Critical remarks can be made about some omissions in the design of several publications, as well as in the design of the entire material. The title of the works presented as a monographic work is missing.
In summary, the most significant shortcomings in the materials for participation in the competition are:
- The achieved scientific and applied solutions and results are protected, but only with one patent.
- No separation protocols are presented for the contributions in the evaluated works and therefore I believe that the authors have equal participation in them.
- There are insignificant shortcomings in the bibliographic description of some literature sources and in the lists of publications.
- The declared contributions are too fragmented, which makes them numerous, it is better to be united.
Despite the critical remarks and shortcomings (which are not essential for the overall assessment), I believe that the formulated contributions are proof that the candidate fully meets the requirements to hold the academic position of "professor".

CONCLUSION
I consider that in terms of quantative and quality indicators for the research activity of the candidate satisfies the requirements of ZRASRB and PPZRASRB. The additional quantitative indicators of the Rules of IICT-BAS for holding the academic position "professor" are also covered, most of which are exceeded. Therefore, I give my positive vote for the academic position of "professor" by Assoc. Prof. Dr. Naiden Nedkov Shivarov.
The application meets the requirements of ZRASRB, PPZRASRB and other internal regulations of IICT-BAS. This gives me reason to recommend to the esteemed scientific jury to evaluate positively the scientific works on the competition and proposed to the Scientific Council of IICT to choose Assoc. Prof. Dr. Naiden Nedkov Shivarov for the academic position "Professor" in "Robots and Manipulators", professional field 5.2. "Electrical engineering, electronics and automation" in the section "Cyber-physical systems" of IICT-BAS.

14th of June, 2022
Sofia

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