

OPINION

on the procedure for promotion to the academic position "Professor" in the professional direction 5.2 "Electrical engineering, Electronics and Automation", scientific specialty "Robots and Manipulators", published in the State Newspaper num. 21/15.03.2022 for the needs of section "Cyber-physical systems" of the Institute of Information and Communication Technologies, BAS, with applicant: Nayden Nedkov Shivarov, PhD, Associate Professor with the Institute of Information and Communication Technologies, BAS
Member of the Scientific Jury: Prof. Eng. Andon Venelinov Topalov, Ph.D., Department of Control Systems, Technical University of Sofia, branch in Plovdiv.

1. General characteristics of the applicant's research and scientific and applied activities.

The candidate in the procedure for promotion to the academic position "Professor" has a diploma of master's degree in engineering from the University of Forestry, Sofia in the specialty "Mechanization of the forest industry" issued in 1997.

In 2001 he was awarded the doctorate after a successfully presented dissertation on the topic "Toolkit for modular intelligent mobile robots" at the Institute of Robotics at the Technical University of Vienna, Austria.

His work experience includes work in the following organizations and companies:

- From 01.09.1997 to 30.06.2001 he was a research associate at the Institute of Robotics at the Technical University of Vienna, Austria.
- From 02.01.2002 to 15.06.2015 the applicant was appointed as a head of Special Projects Department at Code Assistance Ltd.
- From 01.08.2007 to 30.06.2010 he was a research associate at CLMP-BAS, Sofia.
- From 01.07.2010 to 01.10.2014 he was with the ISIR-BAS, Sofia, where since 2012 he has held the academic position "Associate Professor" and was a head of a group on Service Robotics.
- From 15.06.2015 to 28.07.2017 works at the Ministry of Health as a state expert (and since 2017 as Director of the Directorate for Information and Communication Policy in Health).
- From 20.10.2015 to 28.02.2022 Dr. Shivarov served as Associate Professor and Head of Robotics Laboratory at the European Polytechnic University (EPU).
- From 02.10.2017 to 08.05.2019 he was also a head of Information Services Department at Code Assistance Ltd.,
- From 01.03.2019 to the present time, Dr. Nayden Shivarov is associate professor at IICT at BAS, Head of Rilab Laboratory, and from 2020 is also a head of the Cyber-Physical Systems Section.

In the submitted materials for participation in the announced procedure for promotion to the academic position "professor" the candidate has included 34 scientific publications and one patent for invention. Assoc. Prof. Shivarov covers the minimum science requirements of the

Regulations for Implementation of the Law for the Development of Academic Staff in the Republic of Bulgaria for the academic position "Professor" in field 5 "Technical Sciences", professional direction 5.2 "Electrical engineering, Electronics and Automation", in the scientific specialty "Robots and manipulators", as shown in the table 1:

Табле 1

Group	Content - indicators	For the academic position "Professor"	For Assoc. Prof., Ph.D. N. Shivarov
A	Dissertation work for awarding PhD degree	50	50
C	Group C indicators	100	178,5
D	Group D indicators	220	279,58
E	Group E indicators	120	170
F	Group F indicators	150	227
	In total	Minimum 640 p	905,08 p

Group C includes points for the presented, as equivalent to a habilitation work, 10 publications that are referenced and indexed in world-renowned databases of scientific information.

Group D includes points for a published monograph that is not presented as the main work, 13 scientific publications that are referenced and indexed in world-renowned databases of scientific information and 10 scientific publications in unreferenced journals with scientific review or in edited collective volumes.

In 5 of the total publications, as well as in the patent for invention issued, the applicant is the sole author, and in 10 other publications he is the first author.

In the competition materials, the candidate has provided information about 17 citations in scientific publications, referenced and indexed in world-famous databases.

The candidate has also participated in the scientific teams of two national scientific projects and one international scientific project. He was the scientific leader of a national scientific project and a leader of the Bulgarian team in two international scientific projects. The results presented are indicative of the research skills achieved by Assoc. Prof. Dr. Nayden Shivarov and his personal contribution to them is undeniable.

2. Main scientific and scientific and applied contributions.

The main contributions of Assoc. Prof. Dr. Nayden Shivarov in the presented scientific papers for the procedure for promotion to the academic position "Professor" have a scientific, applied-scientific or applied character. The attached contribution report includes eight contributions.

They are related to the development of algorithmic and technological solutions aimed at increasing the possibilities for the use of robots in a variety of areas of modern society or with the development of cyber-physical systems for intelligent management or monitoring. The focus is on the creation of intelligent robots and systems based on rich sensor information and innovative human-machine interface, which can be successfully and innovatively applied to non-industrial tasks – service robots, social robots, etc.

The applicant has not determined which of the contributions he accepts as applied, applied-scientific or scientific. In accepting, in essence, the proposed contributions, I propose that

contributions number 5 and 8 be considered as scientific contributions, those with numbers 3, 4 and 6 to be accepted as applied-scientific and that the remaining contributions be considered as applied.

In general, the contributions consist in proposing new approaches and methods, as well as verifying them through their implementation to solve specific tasks.

3. Importance of contributions to science and practice.

I believe that the research production presented by the applicant, by volume and quality, fully meets the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (LDASRB), its Implementing Regulations and the Regulations on the specific conditions for acquiring scientific degrees and for holding academic positions at IICT for the academic position "Professor". Associate Professor Dr. Eng. Nayden Shivarov is an established scientist, he is well known in the scientific circles at home and abroad and has received scientific and applied-scientific results consistent with modern achievements, that have contributing nature.

4. Critical notes and recommendations.

I do not have any significant critical notes on the materials submitted for participation in the procedure for promotion to the academic position "professor". I would recommend that the candidate should also pay more attention in his future work to the leadership of PhD students, which he will lead to successful presentation of their thesis.

This recommendation does not diminish the achieved by Assoc. Prof. Dr. Nayden Shivarov, very good results.

CONCLUSION

After my knowledge of the documents for the research activities of the candidate and analysis of the scientific papers presented in the procedure for promotion to the academic position, their importance and the scientific and applied contributions contained therein, I find it reasonable to propose to the Estimated Scientific Jury and the Scientific Council of IICT at BAS to support the selection of Associate Professor Dr. Eng. Nayden Nedkov Shivarov for the academic position "Professor" in the professional field 5.2 "Electrical engineering, Electronics and Automation" in the scientific specialty "Robots and Manipulators".

Date: 29.06.2022

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