OPINION

regarding a competition for the occupation of the academic position "Professor" in the area "5. Technical Sciences" in the professional field "5.2 Electrical Engineering, Electronics and Automation", scientific specialty: "Application in principle and methodology in cybernetics in various fields of science (thematic area: "Human-Machine Interface Robotic System") in the department "Interactive robotics and control systems", with a single candidate Associate professor Dr. Maya Ivanova Dimitrova

by Prof. Maya Naydenova Ignatova PhD Institute of Robotics - BAS

By order N° 69/31.05.2023 by the Director of the Institute of Robotics - BAS, I am included in the Scientific Jury for the above-mentioned competition.

As a member of the Scientific Jury, I received all the necessary documents on paper and electronic media for the preparation of the opinion.

Brief biographical data of the applicant

Associate Professor Maya Ivanova Dimitrova received her Master's degree in Psychology in 1985 at the University of St. Petersburg, Russia and her Master's degree in 1994 from the University of Warwick, Great Britain. In 2002, she defended the educational and scientific degree "Doctor" before the Higher Attestation Commission on the topic "Adaptive Human-Computer Interface". In 2007, she acquired the scientific title of "senior research associate second degree", which corresponds to a chief assistant. In 2010, Dr. M. Dimitrova received the academic position of "Associate Professor" in the Departmen "Hybrid Systems and Management" at the IUSI-BAS. From 1989 until now, she has worked in various institutes of the BAS, currently holding the academic position of "Associate Professor" in the Department "Interactive Robotics and Control Systems" at the Institute of Robotics - BAS. Assoc. Dr. M. Dimitrova is proficient and fluent in Russian and English languages, given the fact that she graduated from the First English Language High School in Sofia and her higher education in St. Petersburg, Russia.

Fulfillment of the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria (LDASRB) and the Regulations for its Implementation (RI of LDASRB)

According to the submitted materials for the competition, the candidate has taken an academic position "Associate Professor" in the "Hybrid Systems and Management" section at IUSI-BAS, which is the predecessor of the Institute of Robotics in 2010, which meets the requirements of Art. 60 paras 1 and 2 of the Regulations for the implementation of the LDASRB.

In fulfilment of the requirements of Article 60, para. 3 and 4, 32 scientific works for participation in the competition are presented. After checking at NACID, I found that the submitted works do not repeat the publications related to the materials for filling the academic positions of "principal assistant" and "associate professor".

According to the presented report on the fulfillment of the minimum requirements of the NACID, Assoc.Prof. Dr. M. Dimitrova meets the minimum requirements for indicators A, B,

D, D and E for professional direction 5.2 Electrical engineering, electronics and automation. This fulfills the requirements of Article 60 paragraph 5.

The declaration submitted by the candidate for the competition is accepted that there is no proven plagiarism in the scientific works submitted in the current competition. This fulfills the requirements under Art. 60, para. 6

Characteristics of scientific and scientific-applied production

Assoc. Dr. M. Dimitrova submitted a total of 32 scientific works for review:

- ✓ 11 number of publications referenced and indexed in specialized scientific publications equivalent to habilitation work;
- ✓ 1 number of scientific publications in an edition that is referenced and indexed in a world-renowned database of scientific information;
- ✓ 15 scientific publications in non-refereed journals with scientific review or in edited collective volumes;
- ✓ 5 chapters of collective monographs

Eight of the works are independent, and in 19 – the candidate is in first place. A total of 108 citations are presented, of which: 65 citations and 3 reviews of 20 publications in refereed and indexed specialized scientific publications; 12 citations of 9 articles in monographs and peer-reviewed collective volumes; 28 citations of 15 publications in non-refereed peer-reviewed journals.

Its scientometric indicators exceed the minimum number of points for indicators for PN 5.2 Electrical engineering, electronics and automation of NACID, as shown in the table:

Group of	National requirements (points)	Dr Radeva
indicators		
A	50	50
B		-
C (B in bg)	100	191
D (Γ in bg)	200	205
E	100	772
F	150-	345

Actuality and overview of the content and results in the presented works

The articles from [4.1 to 4.11] have been published in specialized scientific publications and are united as equivalent to a monograph under the title "Cognitive, neuro-cognitive and evaluative aspects of modeling human-robot systems". Developments are aimed at improving a very topical area - the development of cyber-physical systems (CPS) for special education, which rely on effective mental and cerebral processing of information during lessons carried out with the help of humanoid robots.

The advantage of the proposed CPS is the improved diagnostic ability of the system to effectively support the pedagogical process. The focus is on the available knowledge of possible EEG markers for the identification of abstraction, attention and memory, and in some cases combined with eye tracking.

A conceptual model of neuro-cognitive information processing in human-robot interaction has been developed; a cognitive architecture of the learning process is proposed that allows the development of models. 2 approaches are proposed for designing games for cyber-physical pedagogical systems. Approaches are proposed for analyzing the attitudes of teachers and parents in Bulgaria, Greece, Croatia, Bosnia and Herzegovina regarding the inclusion of robotics and information technologies in primary school through on-line questionnaires developed by Dr M. Ivanova.

Several more approaches have been proposed to analyze the adoption of robotic systems by users in the social sphere and in the roles of "cyber-physical teacher" and "cyber-physical museum guide" in the availability of knowledge in digital and physical storage. In other contributions, approaches for practical application of cyber-physical systems are indicated.

Scientific and scientific-applied contributions

The reference to contributions is set out over 10 pages, with each contribution followed by an explanation, which in many cases exceeds one page. This style of framing contributions is unusual, but it helps a great deal to get to the heart of the contribution in order to appreciate its originality. Eight original scientific contributions reflected in the eleven publications equivalent to a monographic work and another six scientific and scientific-applied contributions reflected in the other publications were formed.

I accept the information presented by Assoc. Prof. Dr. M. Dimitrova in the reference for original scientific and scientific-applied contributions.

Research and contributions from its scientific production have been approved at international scientific forums and scientific journals.

I personally know Assoc. Dr. M. Dimitrova, and have been following her scientific development for years. Impressive is the fact that the majority of the works presented are independent, and in 19 of the co-authored works it is in first place. This shows her major contribution to the published developments.

In the last decade Dr. Dimitrova has proven her ability to organize and lead scientific teams, with which she won national and European projects. Also impressive is her participation during the same period as a lead investigator in 5 more projects led by her colleagues.

The presented scientific-applied contributions prove that the theoretical and results were derived when solving practical tasks that needed improvement and generalization. For this reason, her contributions are significant not only in a scientific, but also in a scientific-applied aspect.

Critical notes

I recommend that in the future more her research results be published in editions refereed in Scopus and Web of Science, including those with Impact Factor or Impact Rank.

Conclusion

The candidate fulfills all the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria and the Regulations for its implementation, the Regulations for the terms and conditions for acquiring scientific degrees and for occupying academic abilities at the Institute of Robotics - BAS.

Prof. Dr. Maya Ivanova Dimitrova is an established researcher and this is confirmed by her scientific achievements and contributions, as well as by her results in research activities.

All this gives me the reason to express my positive conclusion about the selection of the candidate for the competition and to confidently recommend that the Scientific Jury unanimously vote a proposal to the Scientific Council of IR-BAS, to choose Assoc. Dr. Maya Ivanova Dimitrova for the academic position " professor" in professional direction 5.2 "Electrical engineering, electronics and automatics"; scientific specialty: "Application of the principles and methods of cybernetics in various fields of science (thematic area: "Robotic systems with Human-Machine Interface") to the section "Interactive Robotics and Control Systems"

27.06.2023 Sofia

/Prof. Maya Ignatova, PhD/