

OPINION

by competition for the occupation of an academic position "Associate Professor" in the section "Processing and analysis of biomedical signals and data" by professional direction 5.2. "Electrical engineering, electronics and automation", scientific specialty "Application of the principles and methods of cybernetics in various fields of science (biomedicine)". The competition was announced in the "State Gazette", no. 69 of 16.08.2024

candidate: **Dr. Tatiana Dimitrova Dobрева, Eng.**

Gave the opinion: Prof. Dr. Eng. Nikola Vichev Kolev, Doctor of Sciences, member of the jury, according to Order No. 1351/14.10.2024 of the Director of the Institute of Biophysics and Biomedical Engineering at the BAS.

1. General and biographical data

The candidate for the competition, Dr. Tatyana Dobрева, was born in 1970 and completed a master's course in radio and television technology at the Technical University - Sofia. She worked for three years at the Institute of Special Electronics and from 1999 until now - at the Central Laboratory of Biomedical Engineering (now the Institute of Biophysics and Biomedical Engineering) as an assistant and chief assistant.

In 2003, she defended her dissertation on the topic "Rapid sedation of an electrocardiographic amplifier after a defibrillation pulse" and received the educational and scientific degree "doctor".

Her total work experience in the specialty is just over 29 years, having qualified in biomedical engineering. She participated in innovation projects under the French-Swiss Shiller Medical SAS consortium, for which she received 2 implementation certificates.

2. General description of the presented materials

The candidate in the competition for the academic position of "Associate Professor", Dr. Dobрева, has submitted the necessary materials for the procedure, including the certificate of compliance of the candidate's materials with the minimum requirements for candidates for the academic position of "Associate Professor", according to the Annex from PUZAD of the BAS.

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

The candidate in the competition worked in the field of biomedical engineering and submitted for review 59 scientific works, including the 5 publications on the dissertation, as follows: 10 publications with the qualities of a habilitation work, such as articles in journals with an impact factor - 8 nos., articles in publications with SJR rank - 9 articles, articles in other peer-reviewed publications - 10 articles and patents - 2 pieces. Out of the total number of scientific works, she is the first author in 8 of them.

Dr. Dobрева's scientific works have been published in journals: Medical and Biological Engineering and Computing; Physiological Measurement; IEEE Sensors Journal; Applied Sciences; Computing in Cardiology; International Journal Bioautomation; International Scientific Conference Electronics and others.

In the list of citations according to the procedure, 258 citations of 36 publications of the candidate were noted by scientists from the country and abroad (Indonesia, China, India, Russia, etc.).

The complex nature of the developments with which the candidate participated in the competition required her to work in a team, and therefore her works are collective.

The scientometric report on the candidate's activities in the competition shows that, with a minimum requirement of 400 points for an Associate Professor at the BAS, Dr. Dobрева achieved 730 points.

The review of the applicant's documents shows that the procedural and legal requirements arising from the RSARB (Art. 29, para. 1), the Regulations thereto (Art. 60) and the Regulations on the terms and conditions for occupying academic positions of the Institute of biophysics and biomedical engineering at BAS have been developed and patented.

4. Basic scientific and scientific-applied contributions

I emphasize that I accept the author's reference for the contributions from the publications, as I will highlight only some of them systematized by me, which are mainly scientific and applied in nature. Let the contributing elements of some research papers that are included in the list of research papers with habilitation qualities be examined and evaluated.

All 10 scientific works are in scientific journals with impact factor or SJR rank, and some more important scientific and applied contributions are formulated in the scope of these works:

1. Innovative circuit solutions of differential and non-differential amplifiers of biosignals without a reference electrode have been developed, in which high input impedance for the useful signal and low for common-mode interference have been achieved. [B4.1, B4.2, Γ8.1, Γ8.2] ;

2. Innovative measuring transducers have been developed for capturing biosignals from sensors with capacitive output impedances, which contribute to the automatic determination of the operating point through active negative feedback, allowing recording of ECG signals [B4.3];

3. Implemented and patented a method and device in which correlated two-time sampling is advanced to correlated multiple sampling techniques for diagnostic purposes [B4.3, Γ7.1]

5. Significance of contributions for science and practice

The significance of the created methods and devices is indisputable, because completed technical developments and patents are offered, some of which have been implemented in practice in the implementation of scientific projects and contracts in our country and abroad

6. Critical notes and recommendations.

I have no critical notes on the materials.

7. Personal impressions and opinion of the reviewer

I note that the candidate in the competition has not proven plagiarism in scientific works in accordance with the statutory procedure (Art. 24. para. 5 of the ZRASRB).

I have no publications in common with Dr. Dobрева and I am not a person related to her in the sense of paragraph 1, item 5 of the Supplementary Provisions of ZRASRB.

CONCLUSION

After getting acquainted with the materials presented by the candidate in the competition (biography, scientific works, participation in projects, contracts, patents and their implementation, their significance, the scientific and applied contributions contained in them), I find it reasonable to support the candidate, to offer the Scientific jury to make a positive decision on the election of Tatyana Dimitrova Dobрева, Ph.D., Eng. and to propose to the Scientific Council of the Institute of Biophysics and Biomedical Engineering at the BAS that she be elected to the academic position of "Associate Professor" in the professional direction 5.2. "Electrical engineering, electronics and automation" (Application of the principles and methods of cybernetics in various fields of science (biomedicine) in the section "Processing and analysis of biomedical signals and data".

25.10.2024

Gave the opinion: Prof. Dr. Eng. Nikola V. Kolev, DSci.