

OPINION

for the competition
for the academic position of "Associate Professor"
in the field of higher education 5. Technical sciences
in the professional direction
5.2. "Electrical engineering, electronics, automation",
scientific specialty "Biomedical equipment and technologies",
announced in SG No. 86 of 6 October 2020,
with a candidate: Asst. Prof. Dr. Zhivko Borisov Bliznakov

Member of the scientific jury: Prof. DSc. Eng. Valeri Markov Mladenov

1. General characteristics of the content and results of the presented works from the research activity of the candidate

Asst. Prof. Dr. Eng. Zhivko Bliznakov is the only candidate in the competition for the academic position of "Associate Professor" and presents information about his research and applied research through a reference, according to Art. 2b of the Law for the Development of the Academic Staff of the Republic of Bulgaria for fulfilment of the minimum scientific metrics of the national requirements for holding the academic position "Associate Professor" in the field of higher education 5. "Technical Sciences".

The candidate Dr. Bliznakov participated in the competition with 28 scientific publications, for which he presented abstracts and full-text articles. All publications are in English and reflect the research activities of the candidate during the period 2000 - 2020, as 23 of the publications are referenced in SCOPUS. In particular:

- Scientific publications from Group B (Group B4), referenced in the international database SCOPUS are 10 in total and are grouped as "Habilitation work - scientific publications in publications that are referenced and indexed in world-famous databases with scientific information";
- Scientific publications from Group G are 18 in total, of which:
 - Group G7, 13 scientific publications referenced and indexed in world-famous databases with scientific information - in the international database SCOPUS;
 - Group G8, 5 scientific publications in non-peer-reviewed journals with scientific review or in edited collective volumes.

From the presented scientific publications, 8 have been published in journals with Impact Factor.

All scientific and applied developments, as well as subsequent scientific publications are directly related to the research activity of the candidate and thematically connected to the scientific specialty of the competition.

2. Assessment of the educational and pedagogical activity of the candidate

Dr. Zhivko Bliznakov has been appointed as an assistant professor in the Department of Medical Equipment, Electronic and Information Technologies in Healthcare at the Faculty of Public Health of the Medical University - Varna. He is the main lecturer in the disciplines "Medical Equipment", "Medical Equipment in Nursing Practice", "Information Systems in Healthcare", and he also gives exercises in the disciplines "Informatics" and "Health Informatics". In addition, he has previous teaching experience of more than 10 years at two other universities, including abroad: Technical University - Varna and the University of Patras, Greece, where he has been a lecturer in the following disciplines: "Clinical Engineering", "Biomedical Technology" and "Special topics - IT applications in medicine", during the period from 2009 to 2019.

The candidate is a co-author of three textbooks in English:

- Textbook (Anthropomorphic Phantoms in Image Quality and Patient Dose Optimization: A EUTEMPE network book, IOP Publishing Ltd, 2018),
- Guide for practical exercises (MPE05: Anthropomorphic Phantoms, Laboratory Exercises - Guide for Learners, European project EUTEMPE-RX, FP7 Fission-2013-5.1.1 (GA: 605298), 2015)
- Lecture course (Aspects of Clinical Engineering – Management of Biomedical Technology, Lecture notes, University of Patras, Greece, 2008).

Dr. Zhivko Bliznakov has been a supervisor of seven successfully graduated Master students at the University of Patras, Greece. He has also been actively involved in the creation, reformation and harmonization of curricula in the field of biomedical engineering in Europe, in the framework of European projects under the TEMPUS IV program.

Based on the presented data, I evaluate the educational and pedagogical activity of the candidate as very good for holding the corresponding academic position.

3. Main scientific, scientifically applied and applied contributions

The scientific publications, 28 in total, Group B and Group G, submitted for participation in the competition, are divided into three main thematic areas, as follows:

Thematic area 1: Computer models, simulations, algorithms and software applications in X-ray imaging.

Publications: B4-01, B4-02, B4-03, B4-04, B4-05, B4-06, B4-07, B4-08, B4-09, B4-10, G7-01, G7-06, G7-07, G8-01

Thematic area 2: Management of medical equipment in healthcare and development of specialized software systems.

Publications: G7-02, G7-03, G7-04, G7-05, G7-13, G8-02, G8-03

Thematic area 3: Reformation and harmonization of curricula in the field of biomedical engineering education in Europe.

Publications: G7-08, G7-09, G7-10, G7-11, G7-12, G8-04, G8-05

Scientific contributions:

- Creation of new algorithms for reconstruction of tomographic images.
- Development of new physical phantoms of the female breast for research in the field of X-ray imaging.

Scientifically applied contributions:

- Investigation of new materials for preparation of physical models for testing of new X-ray techniques.
- New methods for modelling of small in shape and volume composite parts composed of carbon fibres reinforced polymers.
- Development of Monte Carlo-based software simulators for research in the field of X-ray imaging and radiation therapy.
- Development of new computer models of the female breast for research in the field of X-ray imaging.
- Development of a comprehensive integrated software system for improvement of medical equipment management.
- Comprehensive analysis and classification of medical devices' recalls from their manufacturers.

Applied contributions:

- Introduction of new, attractive methods for conducting training in the field of computer simulations in medicine.
- Solution to increase the efficiency and utilization of conventional technologies used in the radiation therapy.
- Implementation of specialized software systems for management of medical equipment in the healthcare sector in Greece.

Teaching contributions:

- A comprehensive overview of the current state of biomedical engineering education curricula in the European universities.
- Proposal for harmonization of curricula in the field of biomedical engineering in the European universities.

4. Assessment and significance of the candidate's contributions

The scientific developments of Dr. Zhivko Bliznakov have significant contributions to the development of science in the broad field of biomedical engineering and technologies. The candidate has a rich publishing activity, which is widely recognized worldwide. He presents his research at prestigious international forums and publishes scientific articles in distinguished scientific journals - 23 of the publications presented in the competition are referenced in the SCOPUS international database, and 8 of them are in journals with Impact Factor. The results of the candidate's research are widely cited by researchers in the field. According to the international database SCOPUS, the candidate has h-index = 9 and a total

of more than 280 known citations of his scientific work, and according to Google Scholar - h-index = 11 and a total of over 500 known citations of his publications.

Dr. Zhivko Bliznakov also has an active participation in 5 national and 18 international research projects.

5. Critical remarks and recommendations

I have no specific remarks on the submitted materials related to the application. I recommend to the candidate to continue working in the field of biomedical engineering and technology, and in the future to act also as an independent author. Regarding the future academic growth of the candidate, I recommend the summarization of the scientific achievements through publication of specialized teaching books and guides for students to facilitate the learning process and assure quality.

6. Conclusion

Based on the documents submitted by the candidate, his scientific publications, his contributions and their significance, according to Art. 2b of the Law for the Development of the Academic Staff of the Republic of Bulgaria, I propose that Assistant Professor Dr. Eng. Zhivko Bliznakov to be elected as an Associate Professor in the field of higher education 5. "Technical Sciences", professional field 5.2 "Electrical Engineering, Electronics and automation", specialty "Biomedical equipment and technologies" at the Faculty of Public Health, Department of Medical Equipment, Electronic and Information Technologies in Healthcare.

Date: 17.02.2021 г.

Member of the scientific jury:

Prof. DSc. Eng. Valeri Mladenov