

REVIEW

concerning a competition for the academic position of "Associate Professor" in the field of higher education 5. "Technical sciences", professional direction 5.2. "Electrical engineering, electronics and automation", scientific specialty "Biomedical equipment and technologies", announced in State newspaper no. 86 / 6.10.2020, with candidate - assistant Dr. Engineer Zhivko Borisov Bliznakov

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The candidate participating in the competition for associate professor has presented a detailed report on his research and applied research activities. The provided information complies with the requirements set forth in item 2b of the Academic Staff Development Act in the Republic of Bulgaria and concerning the fulfillment of minimum national requirements for holding the academic position of "Associate Professor" for the field of "Technical Sciences" in higher education. After getting acquainted with the materials provided by the candidate for the academic position "Associate Professor" in the professional field 5.2. "Electrical Engineering, Electronics and Automation", scientific specialty "Biomedical Engineering and Technology", and based on my personal impressions of his student years, his academic performance and his scientific work, I give the following assessment of the readiness of Assistant Dr. Eng. Zhivko Borisov Bliznakov to hold the academic position of "Associate Professor".

Brief biographical information

Zhivko Bliznakov was born in Varna. In 1991 he graduated with honors from the Second Mathematical High School "Dr. Peter Beron" in his hometown. In 1996 he graduated as an electrical engineer in the specialty "Electronic Engineering and Microelectronics", Technical University - Varna.

As part of a TEMPUS III project, he continued his studies in Greece and in 1998 received a Master's degree in Biomedical Engineering from the University of Patras, Greece.

He studied for a doctorate in the same field and in 2003 successfully defended his dissertation and received the ONS "Doctor" in Biomedical Engineering and Technology from the University of Patras, Greece.

In the period 2004-2015 he worked in a team researching biomedical technologies in the Laboratory of Medical Physics at the University of Patras, Greece. He was the head of the Department of Medical Equipment Management at the Institute of Biomedical Technologies, Patras, Greece.

In 2016 he returned to Bulgaria and in the period 2016-2019 worked as a research associate in the research laboratory for computer simulations in medicine at the Technical University - Varna. During this period he was also the head of the Center for National and International Projects at the same university.

Currently, Zhivko Bliznakov is an assistant at the Department of Medical Equipment, Electronic and Information Technologies in Healthcare, Faculty of Public Health at the Medical University - Varna "Prof. Dr. Paraskev Stoyanov" and vice director of the Center for Simulation Equipment and Medical Equipment at the Medical University - Varna" Prof. Dr. Paraskev Stoyanov.

The candidate's research interests, according to ResearchGate, include: Biomedical Technology Management, Clinical Engineering, Medical Devices Vigilance and Patient Safety, Medical Equipment Management Software Systems, Biomedical Engineering Education, Medical Imaging and Image Processing, Digital Tomosynthesis, Monte Carlo Simulations, Anthropomorphic phantoms, Breast Phantom Modeling.

He is the author of more than 100 publications in peer-reviewed international scientific journals and books with reports from national and international conferences. He has more than fifteen years of teaching experience in the field of Biomedical Engineering and Technology. He has been a reviewer of scientific articles and has been a member of the scientific committees of 2 national and 18 international conferences. Deputy Chairman for a term of office 2016-2020 and 2020-2024 of the Management Board of the Bulgarian Society of Biomedical Physics and Engineering. In the last two decades, he has been actively involved in 5 national and over 15 European projects.

General description of the presented materials

The candidate, Assistant Professor Dr. Eng. Zhivko Borisov Bliznakov, participates in the competition with 28 scientific publications which cover the minimum scientific requirements. The publications are presented in English and reflect the research activity of the candidate in the period 2000-2020.

They are divided into categories as follows:

Scientific publications from Group B (more precisely in *Group B4*) - publications referenced in the international database SCOPUS, equivalent to a monographic work - 10 issues (100.96 points);

The scientific publications referred to in Group G - 18 issues:

- in *Group G7*, referred to in the international database SCOPUS - 13 (167.32 points);
- in *Group G8* - 5 pieces (36.67 points).

Regarding the importance of scientific journals and forums in which articles are published and scientific reports are presented, it can be noted that:

- 8 of the publications are with Impact Factor;
- 23 of the publications are referenced in the international SCOPUS database (distributed as follows: 10 issues in *Group B4* - equivalent to a monograph and 13 issues in *Group G7*).

Regarding the number of co-authors in the presented scientific publications, it can be noted that the candidate has:

- 0 issues - individual articles;
- 5 issues - articles with one co-author;
- 6 issues - articles with two co-authors;
- 17 issues - articles with three or more co-authors.

According to *indicator D*, Dr. Bliznakov presented the cited - 5 pieces (50 points).

According to *indicator A*, Dr. Bliznakov has a dissertation on the topic: "Methodology. for a global approach and development of an integrated software system for management of medical equipment ", recognized in Professional direction 5.3:" Communication and computer technology ", scientific specialty 02.21.07, (50 points).

Pedagogical activity of the candidate

The candidate has over fifteen years of teaching activity in the field of Biomedical Engineering and Technology. He has lectured, conducted laboratory work and supervised graduates at three universities: the University of Patras, Greece, the Technical University of Varna and the Medical University of Varna.

The pedagogical activity of Bliznakov's assistant includes teaching in Bulgarian, English and Greek. The list of subjects taught by the candidate includes:

- "Clinical Engineering", 60 teaching hours, University of Patras, Greece, 2004 - 2016, English language training;
- "Selected topics - software applications in medicine", 60 hours, University of Patras, Greece, 2009 - 2016, Greek language training;
- "Measurement of non-electrical parameters of the human body", 60 teaching hours, Patras University, Greece, 2006 - 2012, English language training
- "Clinical Technology", 30 hours, Technical University - Varna, Greece, 2011, 2016 - 2019, Bulgarian language training;
- "Health Informatics", 15 hours, Medical University - Varna, 2019 - 2021, Bulgarian language training;
- "Informatics", 65 teaching hours, Medical University - Varna, 2019 - 2021, Bulgarian-language education;
- "Management of medical equipment in hospitals", 15 hours, Medical University - Varna, 2020 - 2021, Bulgarian-language training;
- "Information systems in health care and health care", 15 hours, Medical University - Varna, 2020 - 2021, Bulgarian-language training;
- "Medical equipment", 30 hours, Medical University - Varna, 2020 - 2021, Bulgarian-language training;
- "Medical equipment in nursing practice", 60 hours, Medical University - Varna, 2020 - 2021, Bulgarian-language training;
- "Medical equipment in obstetrics and gynecology", 30 hours, Medical University - Varna, 2020 - 2021, Bulgarian language training.

Dr. Eng. Zhivko Borisov Bliznakov is a co-author of a textbook and two textbooks:

- K. Bliznakova, I. Buliev, Z. Bliznakov, Anthropomorphic Phantoms in Image Quality and Patient Dose Optimization: A EUTEMPE network book, (Textbook), Publisher: IOP Publishing Ltd, 2018, Online ISBN: 978-0-7503-1323 -0, Print ISBN: 978-0-7503-1324-7.
- K. Bliznakova, I. Buliev, Z. Bliznakov, MPE05: Anthropomorphic Phantoms, Laboratory Exercises - Guide for Learners, Publisher: European Project EUTEMPE-RX, FP7 Fission-2013-5.1.1 : 605298), 2015.
- Z. Bliznakov, K. Bliznakova, N. Pallikarakis, 2008, Aspects of Clinical Engineering - Management of Biomedical Technology, Lecture notes, University of Patras, Greece, (Lecture course, Publishing House of the University of Patras, Greece), 2008.

The candidate has been the research supervisor of 7 successfully defended graduates.

Scientific, scientific-applied and applied contributions

The scientific publications from *Group B* and *Group G*, 28 in total, submitted for participation in the competition can be 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 for this purpose.

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

Thematic area 3: Reforming and harmonizing curricula in the field of biomedical engineering in Europe.

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

Scientific contributions:

Contribution 1.1. Creation of new algorithms for reconstruction of tomographic images.

Publications: B4-01, G7-07

Contribution 1.6. Development of new physical phantoms of the female breast for research in the field of X-ray imaging.

Publications: B4-06, B4-10

Scientific and applied contributions:

Contribution 1.2. Research of new materials for preparation of physical models for testing of new X-ray techniques.

Publications: B4-02, B4-08

Contribution 1.3. New methods for modeling small in shape and volume composite parts composed of polymers reinforced with carbon fibers.

Publications: B4-03, B4-04

Contribution 1.4. Development of Monte Carlo based software simulators for research in the field of X-ray imaging and radiation therapy.

Publications: G7-06, G8-01

Contribution 1.5. Development of new computer models of female breast for research in the field of X-ray imaging.

Publications: B4-07, B4-09

Contribution 2.1. Development of a comprehensive integrated software system to improve the management of medical equipment.

Publications: G7-02, G7-03, G8-02

Contribution 2.2. Comprehensive analysis and classification of withdrawals of medical devices from their manufacturers.

Publications: G7-04, G7-13

Contribution 3.1. A comprehensive overview of the current state of biomedical engineering curricula in European universities.

Publications: G7-08, G7-09, G7-12

Contribution 3.2. Proposal for harmonization of curricula in the field of biomedical engineering in European universities.

Publications: G7-10, G7-11, G8-04, G8-05

Applied contributions:

Contribution 1.7. Introduction of new, attractive methods for conducting training in the field of computer simulations in medicine.

Publication: B4-05

Contribution 1.8. Solution to increase the efficiency and utilization of conventional technologies used in radiation therapy.

Publication: G7-01

Contribution 2.3. Implementation of specialized software systems for management of medical equipment in the health sector in Greece.

Publications: G7-05, G8-03

Summary information about the candidate's activity from the beginning of his academic activity until now. Significance of the achieved results for science and practice

Publications:

- Articles: 49 issues with a total volume of 335 pages.

- Reports: 69 issues with a total volume of 195 pages.

Participation in scientific forums:

- 14 participations in 10 national scientific forums and conferences;
- 76 participations in 52 international scientific forums and conferences.

Participation in research projects:

- Participation in 5 national research projects
- Participation in 18 international research projects

Courses taught by the candidate:

- Leading lecturer in 8 subjects
- Guided exercises in 10 subjects

Communication languages: English, Greek, Russian

Indicators according to SCOPUS

- h-index - 9 issues;
- articles referred to in SCOPUS - 43 issues;
- citations, in articles and scientific reports, referred to in SCOPUS - 283 issues.

Indicators according to Google Scholar

- h-index - 11 issues;
- articles that are referred to in Google Scholar - 71 issues;
- citations in publications that are referred to Google Scholar - 500 issues;

Assessment of the candidate's personal contribution

The candidate covers all indicators reflected in the Minimum National Requirements for participation in the competition for associate professor.

The scientific papers presented by Dr. Bliznakov's assistant (dissertation, articles in quality journals, reports at prestigious scientific conferences, textbook and teaching aids, citations by other authors), as well as his teaching activity, give me reason to assume that the candidate meets the requirements for holding the academic position of "associate professor".

Taking into account the above factual information and knowing personally and closely the

work of Dr. Bliznakov's assistant, I can confidently say that the personal contribution to the presented scientific production is beyond any doubt.

Critical notes

In the attached materials for the competition I have found the lack of independent publications of the candidate. Due to my personal observations of the scientific development of Assistant Bliznakov, I attribute the lack of independent articles to his teamwork in the teams in which he worked.

As a recommendation, regarding the future scientific and academic growth of the candidate, I can note the need to write textbooks and teaching aids and manuals directly related to the disciplines in which he is a leading lecturer. I believe that the candidate has gained enough research and academic experience and could successfully implement this recommendation in the next 2-3 years.

Personal impressions

As I have already mentioned, I have known Zhivko Bliznakov since the time when he was my student in the ETM department at TU-Varna. I know well his scientific and teaching activity, especially in the last 5 years, when we were colleagues at TU-Varna and MU-Varna. During all these years he was distinguished by his diligence and responsibility for the tasks set. Solves the set tasks with ease and initiates various creative initiatives. Proof of this are the significant number of scientific projects in which he has participated.

Assistant Dr. Bliznakov speaks 3 foreign languages: English, Greek and Russian, which allows him to easily share ideas and communicate with scientists from around the world.

I think that as a scientist and specialist he has indisputable qualities and that he has a serious potential for further academic development. With the successful completion of this competition, MU-Varna will be enriched with a capable, well-trained specialist both as a teacher and as a researcher, implementer and organizer.

Fulfillment of National Center for Information and Documentation (NACID) requirements

The publishing, scientific and teaching activity of assistant Dr. Zhivko Bliznakov covers the minimum national requirements specified in the Law for the Development of the Academic Staff in Bulgaria, which are defined for the academic position of Associate Professor in the

professional field 5.2. "Electrical Engineering, Electronics and Automation", scientific specialty "Biomedical Engineering and Technology", at the Medical University - Varna.

Conclusion

The presence of a dissertation for the scientific degree Ph.D, the large number of citations of the scientific works of Dr. Zhivko Bliznakov, his publishing activity, his research activity, his applied activity, his implementation activity, his organizational activity and his teaching activity, his administrative activity, his wide popularity at home and abroad, give me grounds to convincingly offer assistant Dr. Zhivko Borisov Bliznakov to take the academic position of "Associate Professor" in a professional field: 5.2. Electrical engineering, electronics and automation, specialty Biomedical equipment and technologies, for the needs of the Medical University - Varna.

Varna

February 8, 2021

Reviewer: 

/ Prof. Doctor of Science, Engineer Anton Slavchev Georgiev /

