

## REVIEW

in a competition for an academic position "Professor" in the field of "5  
Technical Sciences", in professional field 5.3 "Communication and  
Computer Engineering", specialty "Theoretical Foundations of  
Communication Engineering"

Discipline "Information systems for data collection"

announced in SG no. 89 / 26.10.2021

Candidate: Assoc. Prof. Dr. Valentina Ilieva Markova

Reviewer: Prof. Dr. Georgi Lyubenov Iliev

### **1. General information and biographical data**

In the competition for the academic position of "professor", announced in the State Gazette, issue 89 / 26.10.2021 for the needs of the Department of Communication Engineering and Technology at the Faculty of Computer Science and Automation at the Technical University - Varna, as the only candidate is Assoc. Prof. Dr. Eng. Valentina Ilieva Markova from the Department of Communication Engineering and Technology at TU-Varna.

Assoc. Prof. Dr. Valentina Markova graduated in Telecommunications at the Technical University - Sofia in 2002, and in 2007 defended her dissertation on "Research and implementation of linear digital recursive circuits without multipliers." Since the beginning of 2007 she has been a lecturer at the Department of Communication Engineering and Technology, Technical University - Varna, holding consecutive positions of assistant, chief assistant and associate professor. Her professional path is entirely related to scientific and teaching activities in the professional field 5.3 "Communication and Computer Engineering". She is a member of professional organizations IEEE and the Federation of Scientific and Technical Unions in Bulgaria (FNTS). She is a member of organizing and program committees of international scientific conferences and expert commissions on "Technical Sciences". She has participated in scientific juries at various universities in Bulgaria and is a member of

the expert commission for evaluation of research projects at the Icelandic Research Fund.

## **2. General description of the presented materials**

The set of documents submitted by the candidate certifies the requirements for the groups of indicators and conditions for holding AD Professor, according to the Regulations on the terms and conditions for holding academic positions at the Technical University - Varna and the Law on Academic Staff Development in Bulgaria.

The candidate Assoc. Prof. Dr. Valentina Markova participates in the competition with 36 scientific publications submitted for review, which can be grouped into the following categories:

- Journal articles - 10;
- Articles in Journals with impact rank – 6;
- SCOPUS and / or Web of Science publications - 31;
- Publications that are not indexed - 5;
- Papers in conference proceedings - 26.

Being on the topic of the review competition, all submitted publications are accepted.

By individual indicators related to the requirements:

- According to indicator 1 of group A, Assoc. Prof. V. Markova covers the required 50 points with a dissertation on "Research and implementation of linear digital recursive circuits without multipliers".
- According to indicator 4 of category B, the candidate presents 10 publications indexed in SCOPUS, which are equivalent to a monograph. With a minimum required score of 100, Assoc. Prof. V. Markova has a total of 180.
- To meet the minimum requirements for a group of indicators of category "D" (minimum 200 points) the applicant submits a total of 26 publications (313.2 points in total), of which 21 are referred to in the SCOPUS database.
- According to criteria "E", the candidate has a total of 32 citations in scientific journals referred to in SCOPUS. These citations correspond to the indicator "E.12", whereby according to the criteria "E" the candidate collects a total of 310 points, with a minimum required 100.
- According to the group of indicators "E" for management and participation in research projects, attracted funds for

projects, published university textbook and patent application, Assoc. Prof. V. Markova collects a significant number of 531 points with a minimum required 150.

- According to the group of indicators "F", the candidate exceeds many times the minimum requirements of 120 points, and only for the last three years has spent a total of 1100.8 lecture hours at TU-Varna.

The presented documents show that the candidate significantly exceeds the minimum requirements for holding the academic position "Professor" in the field of "5 Technical Sciences", according to PURZAD in TU-Varna.

### **3. General characteristics of the research and applied research activities of the candidate**

Research can be divided into two main groups:

**New methods for detecting emotional states, cognitive load and stress** - these are the publications from group B4, which are equivalent to habilitation work. [B4.1] to [B4.10]

**New methods for collecting and processing signals** - publications falling into group D. [D7.1] to [D7.21]

The presented documents prove the active and significant scientific activity of the candidate. Assoc. Prof. Dr. Valentina Markova participates in the organizational and program committees of a number of international conferences held in Bulgaria and abroad.

In her capacity as Head of Section 5.3 "Communication and Computer Engineering" at the Research Institute of TU-Varna, for the period May 2019-May 2021 Assoc. Prof. Valentina Markova participated in the preparation and submission of 15 research project proposals funded by national or international programs. 5 of them are international, 2 are from the framework programs of the European Union, 1 to the National Innovation Fund, 3 are to the Research Fund, and the remaining 6 are to TU-Varna. In 3 of the projects the candidate is a coordinator and researcher, in 12 projects she is a leader and a researcher, in the others she participates as a researcher. These data give grounds for an excellent assessment of the scientific and applied activity of Assoc. Prof. Valentina Markova.

#### **4. Assessment of the pedagogical preparation and activity of the candidate**

The candidate has a total of 15 years of teaching experience at the Technical University of Varna. She has taught the following subjects: "Communication Circuits", "Cable Communication Lines", "Telephometric and Optical Measurements", "Cable and Fiber Optic Lines", "Computer Systems", "Switching, Multiple and Cable Technology", "Systems for data collection ", " Computer control in telecommunications ", Information systems for data collection, Audio systems, Graphic modeling with LABVIEW, Sensor networks for students of the Faculty of Computer Science and Automation. With her participation, new curricula, software products and laboratory facilities have been created.

Assoc. Prof. Valentina Markova is the supervisor of three doctoral students, one of whom graduated with the right to defense. She has supervised more than 30 graduates, including two awarded by the Municipality of Varna "Best Diploma Thesis", respectively, first and second place. She is a reviewer of more than 20 diploma theses and is a member of the commission for diploma defenses and state exam.

In this part of the analysis of the pedagogical activity of the candidate should be noted her active participation in organizing a number of student seminars such as Electronics' day 2014, Biomedical data acquisition and applications Workshop 2017 and Gaming, learning and teaching, 2019.

The presented factology is an objective evidence of the multifaceted and active educational activity of Assoc. Prof. Valentina Markova. It gives me reason to believe that the pedagogical activity of the candidate fully complies with the requirements for holding the academic position of "professor".

#### **5. Main scientific and applied contributions**

The scientific production of Assoc. Prof. Valentina Markova contains indisputable scientific and scientifically applied contributions, which can be divided into two main groups.

**New methods for detecting emotional states, cognitive load and stress:**

- new methods for detecting negative emotional states and stress from physiological signals (photoplethysmogram, ECG, surface galvanic resistance of the skin) or speech;
- improved existing and new methods for extracting descriptors from physiological signals;
- a new intelligent architecture for highly responsible communications that is sensitive and adaptable to the context of available 3G / 4G / 5G networks.

The results of the research have been published in a total of 10 papers, all of which are indexed in SCOPUS and / or Web of Science, and two are in impact-rated journals.

**New methods for signal collection and processing:**

- new methods for processing and analysis of physiological signals;
- new algorithms for processing and analysis of audio and speech signals;
- new resources and algorithms for ergonomic assessment of the working environment and prevention of musculoskeletal disorders;
- new resources, study of the applicability of traditional modeling methods to the propagation of radio waves over the Black Sea;
- new resources and software to support training, research and applied activities at TU-Varna;
- evaluation of the applicability and effectiveness of innovative training methods for the specifics of engineering education at TU-Varna.

The results of the research have been published in a total of 26 papers, of which 21 are indexed in SCOPUS and / or Web of Science, 4 of which are in impact-rated journals. In connection with the research in this group, an application for patenting a utility model was made.

Two of the publications related to the first group have one citation. Of the publications containing results from the second group, one has 10 citations, three of the publications have 2 citations, four of the publications have 1 citation.

Judging by the number of co-authors of the scientific papers and the place of the candidate among them, the personal contribution of Assoc. Prof. Valentina Markova is indisputable.

## **6. Significance of contributions to science and practice**

From the reference for the scientific and scientifically applied activity of Assoc. Prof. Valentina Markova it is evident that the results of her work have been published in the form of reports at prestigious scientific conferences and articles in peer-reviewed journals. The most significant publications are those in impact-ranked publications, including an article in the Bulletin of Electrical Engineering and Informatics with SJR 0.251. The group of important publications also includes the reports of IEEE conferences and published in the IEEE Xplore Digital Library, which is the largest and most frequently used reference database in the world for scientific and applied research related to electrical engineering and electronics.

From the reference for noticed citations of the candidate's works it can be seen that 32 of them are in prestigious publications and forums in the country and abroad, which is a high international assessment and recognition for her research and publication activities.

Recognition of the importance of her research are her multiple participations as a member of program committees and reviewer of a number of international scientific conferences and symposia such as Biomedical Innovations and Applications - BIA2021, Automatics and Informatics 2021, ICEST2021, International Scientific Symposium Metrology and Metrology Assurance 2021.

The places of publication, the total number of peer-reviewed publications and the number of their citations show that they have gained wide recognition and accessibility for the scientific community in Bulgaria and abroad and on these indicators fully meet the requirements of the competition.

## **7. Critical remarks and recommendations**

I have no remarks on the scientific works of the candidate, which have been prepared and shaped according to standards recognized in the scientific community.

Two recommendations:

- I would recommend developing some of the ideas for signal collection and processing and try to publish them in IEEE periodicals;

- I would recommend to intensify her work with doctoral students and young scientists.

### **8. Personal impressions and opinion of the reviewer**

I know the candidate from the time when she was a doctoral student at the Technical University of Sofia and I can say that the excellent impressions of the work of Assoc. Prof. Valentina Markova during that period fully correspond to the very high level of her participation in this competition.

### **CONCLUSION**

Based on the acquaintance with the presented scientific papers, their significance, the scientific, applied and applied contributions contained in them, I find it reasonable to propose Assoc. Prof. Dr. Valentina Ilieva Markova to take the academic position of "professor" in the field of "5 Technical Sciences". , in professional field 5.3 "Communication and computer engineering", specialty "Theoretical foundations of communication engineering", discipline "Information systems for data collection".

Заличена информация  
по Регламент (ЕС)  
2016/679

Date: 10.02.2022.

**REVIEWER:**

/ Prof. Dr. G. Iliev /