

## REVIEW

in a competition for the academic position of “**Professor**”  
in professional field 5.3 “Communication and Computer Engineering”,  
subject “Computer networks”,

Announced: in State Gazette issue 110/24.12.2021

Candidate: **Assoc. Prof. Eng. Veneta Panayotova Aleksieva, PhD**

Reviewer: **Prof. Eng. Teodor Bozhidarov Iliev, PhD**

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

In this competition for occupation the academic position Professor, appointed in the Bulgarian State Gazette issue 110/24.12.2021 and on the official website of Technical university - Varna, the only candidate for this position is Assoc. Prof. Eng. Veneta Panayotova Aleksieva, PhD.

Assoc. Prof. Eng. Veneta Panayotova Aleksieva, PhD is graduated from Technical University – Varna with MSc “Computational technique” in 1993. She was selected as an assistant in the Department of Computer science and technology at the Technical University of Varna after a competition in 2006, consecutively as an assistant and chief assistant. She habilitated as an Associate Professor at the same department - scientific specialty "Computer systems, complexes and networks" in 2016.

In 2012 she defended successfully a dissertation for obtaining the educational and scientific degree PhD on the topic „Tools for analysis and management of computer networks" in the scientific field "Automated information processing and management systems".

The candidate has very good language skills. She is fluent in English and Russian (level C1), which allows Assoc. Prof. Aleksieva to maintain useful contacts and exchange information with colleagues from abroad. She has good communication and teamwork skills acquired during her work as a lecturer and participant in research projects.

In addition to scientific and research work, the candidate has an impressively wide range of administrative and public activities: she is a member of professional organizations ACM, the Chamber of the engineers in investment design, and the society of automatics and informatics. She was a member of scientific juries for obtaining various educational and scientific degrees and a member of the expert commission for the evaluation of scientific projects at the European Commission. She has full design qualifications in the part Automation and instrumentation and Electrical part. Assoc. Prof. Veneta Aleksieva is a certified instructor at the Cisco Academy of Technical University - Varna. She is a member of organizing and program committees of international scientific conferences.

All the necessary documents for participation in the competition for the academic position "Professor" are presented including application to the Rector of TU-Varna, candidate CV, diploma for the Educational and Scientific Degree "Doctor", diploma for the academic position "Associate Professor", certificate of completion of the minimal national requirements, list of scientific papers related to the competition, description of the contributions, papers submitted for participation in the competition for "Associate Professor" and for the acquisition of the Educational and Scientific Degree "Doctor", papers for participation in the competition for "Professor" and other documents for scientific and teaching activities of the candidate. The entire documentation is very thoroughly prepared and contains all the necessary information for the competition about the candidate.

Assoc. Prof. Veneta Aleksieva's research, engineering, and pedagogical activities are developed in a balanced and simultaneous way, complementing each other.

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

Assoc. Prof. Veneta Aleksieva, PhD participated in the competition with 53 scientific papers according to the groups of indicators (B.4, G.7 and G.8) and 13 textbooks.

The publications can be classified, as follows:

**- By importance**

- Referenced and indexed in a world-renowned database (Scopus) – **29** papers [B4.1 - B4.16, G7.1 - G7.13 of the attached list of publications].

**- By language:**

- English - **39** papers [B4.1 - B4.17, G7.1 - G7.13, G8.1, G8.14, G8.15, G8.8, G8.9, G8.12, G8.19, G8.20, G8.6, G8.24 of the attached list of publications];
- Bulgarian - **14** papers [G8.2, G8.3, G8.4, G8.5, G8.7, G8.10, G8.11, G8.13, G8.16, G8.17, G8.18, G8.21, G8.22, G8.23 of the attached list of publications];

**- Place of publication:**

- Articles in foreign journals - **1** paper [G8.6 of the attached list of publications];
- Articles in Bulgarian journals - **8** papers [G8.16, G8.21, G8.24, G8.8, G8.9, G8.12, G8.19, G8.20 of the attached list of publications];
- Articles in proceedings of international scientific conferences abroad - **1** paper [G8.15 of the attached list of publications];
- Articles in proceedings of international scientific conferences in Bulgaria - **43** papers [G8.2, G8.3, G8.4, G8.5, G8.7, G8.10, G8.11, G8.13, G8.17, G8.18, G8.22, G8.23, B4.1 - B4.16, G7.1 - G7.13, G8.1, G8.14 of the attached list of publications];

**- By the number of co-authors:**

- With single-author - **2** papers [G8.3, G8.8 of the attached list of publications];
- With one co-author - **15** papers [G7.9, G8.1, G8.2, G8.5, G8.9, G8.10, G8.11, G8.12, G8.13, G8.14, G8.15, G8.16, G8.17, G8.18, G8.19 of the attached list of publications].
- With two co-authors - **30** papers [B4.1, B4.2, B4.3, B4.4, B4.5, B4.6, B4.8, B4.9, B4.10, B4.11, B4.15, B4.16, G7.1, G7.2, G7.3, G7.4, G7.5, G7.6, G7.7, G7.8, G7.10, G7.11, G7.12, G7.13, G8.4, G8.7, G8.20, G8.21, G8.22, G8.23 of the attached list of publications].
- With three or more co-authors - **6** papers [B.4.7, B4.12, B4.13, B4.14, G8.6, G8.24 of the attached list of publications].

The contents of the above scientific papers are fully relevant to the scientific field of the competition for the academic position “Professor”.

After reviewing the submitted lists of publications, I accept for review 25 of the 29 publications in SCOPUS. This is due to the fact that 4 papers (B4.12, G.7.9, G.7.10, and G7.11 from the international conference CIEES'21) are expected to be published by AIP Conference Proceedings and reflected in Scopus <https://aip.scitation.org/apc/info/forthcoming>, but still, they are not yet.

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

The scientific research and applied activities of the only candidate in the competition are in the field of communication networks and systems.

The candidate Assoc. Prof. Veneta Aleksieva has presented materials – scientific papers equivalent to monograph, scientific publications, reference for citations, participation in scientific projects, own lecture materials on different subjects, supervision and successfully defended PhD students, participation in the modernization of the material-technical basis and fundraising. Therefore the applicant fully covers the minimum national requirements for occupying the academic position of Professor, in the field of Technical Sciences in higher education - according to article 2b of the Rules for Implementation of the Academic Composition Development Law in the Republic of Bulgaria and Regulations for the conditions and order for acquiring academic degrees and academic positions at Technical University - Varna.

The candidate's main scientific and applied contributions in the submitted publications under the competition can be classified according to the fulfillment of the scientometric criteria as follows:

Groups of indicators	Content	Minimum score points for academic position Professor	Fulfillment
A	Indicator 1	50	<b>50 т.</b>
B	Indicator 3 or 4	100	<b>285 pts.</b> (indicator 4)
G	Sum of indicators from 5 to 9	200	<b>362,2 pts.</b> Indicator 7 – 133,0 pts. Indicator 8 – 229,2 pts.
D	Sum of indicators from 12 to 14	100	<b>424 pts.</b> Indicator 12 – 340 pts. Indicator 13 – 84 pts.
E	Sum of indicators from 16 to 26	150	<b>500,84 pts.</b> Indicator 17 – 80 pts. Indicator 18 – 180 pts. Indicator 19 – 20 pts. Indicator 20 – 100 pts. Indicator 22 – 4,14 pts. Indicator 24 – 116,7 pts.
J	Indicator 29	120	<b>2130 pts.</b> Indicator 29 – 2130 pts.

A comparison of the application materials presented in fulfilment of the minimal national and institutional requirements for the academic degree "Professor" in scientific field 5. Technical Science, shows the following:

**Indicator group A** - dissertation for occupying the "Doctor" degree (at least 50 points) – **50 points**;

**Indicator group B** – indicator 4 – scientific publication (at least 10) which are referenced and indexed in world famous databases (at least 100 points) - **285 points**;

**Indicator group G** – 10 scientific papers which are referenced and indexed in world famous databases - 133 точки and 24 scientific papers in peer-reviewed and non-refereed editions – 229,2 точки. Total for indicator G - **362,2 points**.

**Indicator group D** – citations or reviewing in scientific editions, which are referenced and indexed in world famous databases or in monographs and collective volumes (at least 100 points) – 15 scientific publications cited 34 times in review scientific editions (340 points), 28 citations of 14 scientific publications in monographs and collective volumes with scientific review (84 points) - **424 points**. Assoc. Prof. Aleksieva has H index 4 as a result of her exhaustive research work, publications, and being cited by other authors - <https://www.scopus.com/authid/detail.uri?authorId=36458239000>.

**Indicator group J** – research, development and implemented activity (at least 150 points) – two PhD students successfully defended their thesis (80 points), participation in 18 scientific or educational projects (180 points), participation in one international scientific or educational projects (20 points), leadership in 5 national scientific or educational projects (100 points), project funds raised and managed by the candidate with a value of BGN 20 700 (4,14 points), 13 textbooks (116,7 points) – **500,84 points**.

**Indicator group J** - lectures at Technical university-Varna for the last three years (at least 120 точки) – *Local and Internet networks administration (180 hours), Local and Internet networks administration – BSc AEO (60 hours), Wireless communications – MSc (180 hours), E-commerce (240 hours), E-commerce – BSc AEO (180 hours), BSc – BSc in English for incoming Erasmus students (60 hours), Integrated computer systems and networks – MSc (180 hours), Computer communications and networks - MSc (120 hours), Computer networks (240 hours), Computer networks - BSc AEO (60 hours), Network administration – BSc in English for incoming Erasmus students (60 hours), Fundamentals of computer communications (270 hours), Fundamentals of*

*computer communications - BSc AEO (60 hours), Fundamentals of computer communications – BSc in English for incoming Erasmus students (60 hours), Computer network design – MSc (180 hours) – 2130 points.*

The participation of Assoc. Prof. Aleksieva in scientific juries, in the editorial boards of a number of national scientific conferences and forums, and her recognition at a number of universities in Bulgaria, I consider as evidence of her authority in the field of models and methods of providing QoS in networks.

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

Assoc. Prof. Veneta Aleksieva, PhD has considerable teaching experience. Over the last 3 academic years she has taught the following subjects: Local and Internet networks administration, Wireless communications, E-commerce, Integrated computer systems and networks, Computer communications and networks, Computer networks, Network administration, Fundamentals of computer communications, Computer network design for the Bachelor's and Master's degrees in the professional field 5.3 Communication and Computer Engineering, as well as for incoming Erasmus students.

She has been a diploma work supervisor to more than 50 students who defended successfully. Undoubted proof of Assoc. Prof. Aleksieva's work with students not only during regular academic hours but also outside of them is the participation of students with scientific articles under her supervision at different international conferences

Assoc. Prof. Veneta Aleksieva, PhD has realized Staff Mobility for Teaching under Erasmus+ Programme in different European universities. She is the author of 13 textbooks.

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

From the analysis of the presented materials I can classify the main contributions of the candidate in the competition as follow:

##### **1. Scientific and scientific-applied contributions in the following main areas:**

##### **1.1. *Research in the field of methods to improve the Quality of Services (QoS) in advanced wireless networks.***

The following scientific papers from indicator B.4 and G.8 (B4.1, B4.2, B4.3, B4.4, B4.5, B4.6, B4.7, B4.8, B4.9, B4.10, B4.11, B4.13, B4.14, B4.15, B4.16, G8.3, G8.8, G8.10, G8.11, G8.12, G8.24 - 21 papers) can be referred to this area and the following contributions:

- A resource allocation algorithm based on the prioritization of traffic classes in a LiFi network is proposed.
- Algorithms and approaches for improving QoS for LTE networks based on traffic prioritization in the scheduler are proposed.
- An algorithm for designing an energy-balanced ZigBee network has been proposed.
- A resource allocation algorithm based on traffic prioritization for a 6LoWPAN network is proposed.
- A pathfinding algorithm in a LoRaWAN network has been proposed.
- Approaches to improve QoS for wireless sensor networks based on LiFi, ZigBee, 6LoWPAN and BLE technologies are proposed.

##### **1.2. *Research in the field of cloud computing.***

The following scientific papers from indicators G.7 and G.8 (G7.4, G7.8, G7.12, G7.13, G8.4, G8.7, G8.14, G8.19 - 8 papers) can be referred to this area and the following contributions:

- Algorithms and approaches for balanced load in SDN and best pathfinding between hosts have been proposed.
- A model and approach for managing Active Directory as a directory-as-a-service has been proposed.
- An approach has been proposed for the implementation of a cloud service for reservations of medical examinations.

##### **1.3. *Research in the field of networks security.***

The following scientific papers from indicator G.8 (G8.1, G8.5, G8.9, G8.13, G8.23 - 5 papers) can be referred to this area and the following contribution:

- An approach to testing vulnerabilities in wireless networks has been proposed.

**1.4. *Research in the field of application of blockchain technology in business.***

The following scientific papers from indicators G.7 and G.8 (G7.1, G7.2, G7.3, G7.5, G8.17, G8.18, G8.20, G8.21 - 8 papers) can be referred to this area and the following contributions:

- Insurance models based on a smart contract on a private blockchain, a public blockchain and a combined solution have been proposed.
- A property insurance model based on a smart contract on a blockchain and a private blockchain has been proposed.

**1.5. *Research in the field of computer systems and technologies.***

The following scientific papers from indicators G.7 and G.8 (G7.6, G7.7, G8.2, G8.6, G8.15, G8.16, G8.22 - 7 papers) can be referred to this area and the following contributions:

- A method for activating a wearable device with a touch-sensitive 2-finger bezel has been proposed.
- A method for posture recognition when activating a wearable device interface has been proposed.
- An algorithm for improving QoS in PON networks by prioritization and resource allocation is proposed.

**2. *Applied contributions in the following main areas:***

**2.1. *Research in the field of methods to improve the Quality of Services (QoS) in advanced wireless networks.***

- Prototypes for LiFi communication have been developed and an indoor LiFi network with horizontal handover has been implemented.
- A simulation environment for the LTE network has been developed, implementing the proposed algorithm and 9 other known algorithms.
- A simulation environment for the LiFi network has been developed, implementing the proposed algorithm and 3 other known algorithms.
- A simulation environment has been developed for the 6LoWPAN network, implementing the proposed algorithm and 6 other known algorithms.
- A simulation environment for the ZigBee network has been developed, implementing the proposed algorithm.
- A simulation environment for the BLE network for communication visualization has been developed.
- A simulation environment for LoRaWAN has been developed, implementing the proposed algorithm.
- An experimental network for the implementation of 6LoWPAN, ZigBee, BLE technologies have been implemented.

**2.2. *Research in the field of cloud computing.***

- An experimental virtual infrastructure for training in disciplines related to computer networks has been implemented.
- Web-based and Cloud-based systems for booking medical examinations have been developed.
- Six tools for monitoring and managing virtual infrastructures based on Zabbix for VMWare have been developed.
- A web-based Active Directory management environment has been developed.

**2.3. *Research in the field of networks security.***

- A DoS attack generator has been developed.
- A hardware data collection system for wireless networks, suitable for war-driving technology, has been developed.

**2.4. *Research in the field of application of blockchain technology in business.***

- The proposed models have been implemented through smart contracts on public blockchain (Ethereum) and private blockchain (Hyperledger Fabric).
- A web-based system for selling crypto-tokens for ICO (Initial Coin Offering) based on the Ethereum blockchain has been created.

### ***2.5. Research in the field of computer systems and technologies.***

- Two prototypes of a smartwatch have been created - with buttons and a touch-sensor bezel.
- A test environment has been created to collect readings for activating the touch interface of a 2-finger wearable device.
- A simulation environment for the PON network has been developed, implementing the proposed algorithm.
- A software training system for coding and modulation has been developed.

I accept the contributions announced by Assoc. Prof. Veneta Panayotova Aleksieva, PhD. I define the contributions presented as: scientific, scientifically applicable, and applied. I consider that the requirements for quantitative performance criteria for academic position "Professor" are met.

Assoc. Prof. Veneta Aleksieva has submitted information for 62 citations, 34 of them in SCOPUS and/or Web of Science database, 26 from them by foreign authors. The reference to the citations shows that the scientific publications of Assoc. Prof. Aleksieva are well known and accordingly evaluated by the scientific community in Bulgaria and abroad

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

The scientific and scientific-applied research of Assoc. Prof. Veneta Aleksieva has contributed to the theory, practice and education because they are dedicated to current problems of the evolution of the communication networks - methods to improve the Quality of Services and wireless network security.

The author's contributions have become available to the scientific community in Bulgaria and abroad, through her publishing activity (35 scientific papers in the Scopus database) in prestigious journals and forums (Conferences: BIA 2019, 2020; ICAI 2019, 2020, 2021; CIEES 2020, 2021; ELMA 2021; SIELA 2020; TECHSYS 2016, 2017, 2018; Scientific conference of the University of Ruse 2016; Unitech 2016, 2017, 2018, 2019, and etc. Journals: „Computer science and technology“ 2016, 2018; „Informatics and innovative technologies“ 2019; „Journal of the Technical University – Sofia“ 2016, 2017, 2019; „Computer systems and technology“ 2021; „Journal of KONES Powertrain and Transport“ 2016; „Information technologies and control“ 2016, etc. Evidence of this is the more than 53 citations in Scopus.

Assoc. Prof. Aleksieva's authority in the scientific community speaks the fact, that she is a member of the editorial committees of the journal „Scientific bulletin of Wroclaw school of Applied Informatics „Informatica““ and of the organizing and scientific committee of the conferences „Computer science and technology“, „International Conference Automatics and Informatics“, „Balkan Conference on Informatics“ and „International Scientific Conference of Communications, Information, Electronic and Energy Systems“, and reviewer of the scientific articles for the following international conferences „Telecom“ 2021; „Intelligent Information Technologies for Industry“ 2017 and „International Scientific Conference of Communications, Information, Electronic and Energy Systems“ 2020, 2021.

The independent publications of Assoc. Prof. Veneta Aleksieva, PhD and those where she has a lead role, are evidence of her leadership in the research. The scientific ideas and approaches presented and defended in scientific forums are an assessment of the candidate's personal contribution

The presented quantitative indicators correspond with the criteria for occupying the academic position "Professor".

### 7. Critical remarks and recommendations

I have no critical remarks on the documents, scientific production and academic activity presented by the candidate. I will point out some recommendations for the future work of Assoc. Prof. Veneta Panayotova Aleksieva, PhD:

- Gaining experience with research projects through active participation in national and international projects;
- I recommend that the applicant to increase her presence in the worldwide scientific community with publications in scientific journals with impact factor.

### 8. Personal impression and opinion of the reviewer

I know Assoc. Prof. Veneta Panayotova Aleksieva, PhD personally from participation in the annual UNITECH Scientific Conference, Scientific conference of the University of Ruse and international scientific conference CIEES. Assoc. Prof. Aleksieva has left an impression of a serious and business-oriented scientist. She has the reputation of an erudite lecturer.

### CONCLUSION

My general assessment is that the applicant's presentation in the competition for occupying the academic position "Professor" corresponds with the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria and the Regulations on its implementation as well as the Regulations for the conditions and order for acquiring academic degrees and academic positions at Technical University – Varna.

After reviewing the candidate's scientific works for participation in the competition, scientific, scientific-applied, and educational-methodological contributions contained in them, I find it appropriate to **recommend Assoc. Prof. Veneta Panayotova Aleksieva, PhD for the academic position "PROFESSOR"** in the professional field 5.3. Communication and Computer Engineering, subject "Computer networks" at the department "Computer science and technology" of Technical university Varna.

March 30, 2022

REVIEWER

/Prof. Teodor Iliev, PhD/

Заличена информация  
по Регламент (ЕС)  
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