



ВНШЕ УЧИЛИЩЕ ПО ТЕЛЕКОМУНИКАЦИИ И ПОЩА

REVIEW

from: prof. eng. Borislav Yordanov Bedzhev, DSc,
professor with the Department of Communication Networks and Systems,
NMU "V. Levski", Faculty "Artillery, Air-Defense and Communication and Information
Systems" – city of Shumen

field of higher education: 5 "Technical sciences"

professional field: 5.3 "Communication and Computer Technics"

Subject: competition for an academic position **Professor** in professional field:
5.3 "Communication and Computer Technics", scientific specialty: "Theoretic
basics of the communication technics" (5G mobile networks; Protection of the
wireless networks)

1. Information about the competition

In the competition for occupation of the academic position "Professor" in the University of telecommunications and post (UTP), in the field of higher education 5 "Technical sciences", professional field 5.3 "Communication and Computer Technics", scientific specialty "Theoretic basics of the communication technics", educational disciplines "5G mobile networks" and "Protection of the wireless networks", announced in the State Gazette issue 56/19.07.2022, one candidate participates – assoc. prof. eng. Grigor Yordanov Mihaylov, PhD, associate professor at the Department of Telecommunications of the UTP.

2. Information about the candidates

Assoc. prof. eng. Grigor Mihaylov, PhD, had obtained „Bachelor“ and „Master“ educational degrees in Angel Kanchev University of Ruse (A. Kanchev UR) in the periods 2004 – 2008 and 2008 – 2009 respectively with the speciality "Communication technics and technologies". In the period 2010 – 2015 he had been PhD student in the department "Telecommunications" with A. Kanchev UR. During his PhD study and after successful defending of his dissertation in A. Kanchev UR he had consecutively occupied the academic positions Assistant Professor (2011 – 2015) and Chief Assistant Professor (2015 – 2018). In 2018 in UTP he had been elected for Associate Professor in professional field 5.3 "Communication and Computer Technics".

3. Fulfilling the requirements for the academic position

3.1. Fulfillment of the quantitative requirements for occupying the academic position

The candidate participates in the competition with 38 publications, which can be classified as follows:

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By type:

- Articles - 6 publications;
- Reports - 32 publications.

By significance:

- Scientific publications in editions that are referenced and indexed in world-recognized databases with scientific information - 28 publications.

By publication's place:

- Articles in referenced international journals - 3 publications;
- Papers in proceedings of international scientific conferences abroad - 17 publications;
- Articles in national journals - 3 publications;
- Papers in proceedings of international scientific conferences in Bulgaria - 14 publications;
- Papers in proceedings of national scientific conferences, sessions and workshops - 0 publications;
- Reports in universities' scientific proceedings - 1 publication.

By the language in which they are written:

- In English - 30 publications;
- In Bulgarian - 8 publications.

By the number of co-authors:

- Prepared independently - 1 publications;
- With one co-author - 2 publications;
- With two co-authors - 3 publications;
- With three or more co-authors - 32 publications.

3.2. Fulfillment of the qualitative requirements for occupying the academic position

All citations of the scientific works of assoc. prof. eng. Grigor Mihaylov, PhD, presented for participation in the competition, are made in scientific editions, referred and indexed in world-recognized databases with scientific information or in monographs and collective volumes. They can be classified as follows:

Quantity of citations (including auto-citations) – 38 citations;

- by Bulgarian authors - 23 citations;
- by foreign authors - 15 citations;

Quantity of citations (without auto-citations) - 32 citations;

- by Bulgarian authors - 17 citations;
- by foreign authors - 15 citations.

The above pointed out facts demonstrate that the scientific production of assoc. prof. eng. Grigor Mihaylov, PhD, is known to the scientific community, working in the field of the competition topic.

It should be noted that all the scientific works of assoc. prof. eng. Grigor Mihaylov, PhD, have been printed and reviewed. In addition, the scientific, scientific-applied and applied contributions, presented by him, correspond to the professional direction 5.3 "Communication and Computer

Technics", scientific specialty "Theoretic basics of the communication technics" and all the requirements of the Law for development of the academic staff in Republic of Bulgaria (LDASRB), the Rules for applying of the LDASRB and the Procedural Rules for Acquisition of Scientific Degrees and Occupation of Academic Positions (PRASDOAP) of UTP are fulfilled. This fact is demonstrated by the fulfilment of scientometric indicators, defined in the LDASRB:

- 1) Indicator 1 - 50 pts, (minimal requirements of 50 pts);
- 2) Indicators 3 or 4 - 171 pts, (minimal requirements of 100 pts);
- 3) Sum of Indicators from 5 to 11 - 218,99 pts, (minimal requirements of 200 pts);
- 4) Sum of Indicators from 12 to 15 - 320 pts, (minimal requirements of 100 pts);
- 5) Sum of Indicators from 16 to 28 - 180 pts, (minimal requirements of 150 pts);
- Total - 939,99 pts, (minimal requirements of 600 pts).

4. Evaluation of teaching and learning activities for each candidate

In UTP assoc. prof. eng. Grigor Mihaylov, PhD, has developed educational programs, lecture, practical and test materials for the disciplines:

- "Computer design", "Basics of telecommunications" and "Protection of the wireless networks" for the specialities "Wireless communications", "Software design" and "Cybersecurity of high technologies", as well as "5G networks" for the speciality "Wireless communications", "Professional Bachelor" educational degree;
- "Mobile modular systems" and "5G and smart technologies" for the specialities "Digital enterprise and high technologies" and "Digital public administration", "Bachelor" educational degree;
- "Basics of telecommunications" and "5G networks" for the speciality "Telecommunication technologies", "Bachelor" educational degree;
- "Technical systems for security" for the speciality "Cybersecurity of the communication technologies", "Bachelor" educational degree;
- "Basics of telecommunications" and "Networks for mobile communications" for the speciality "Management in telecommunications and posts", "Bachelor" educational degree;
- "Basics of communication systems", "Computer graphics", "Wireless networks and 5G networks" for the speciality "Air traffic service communication systems", "Bachelor" educational degree;
- "Multimedia communications in Internet", "Platforms for video content and multimedia", "Security in communication networks" и "Practicum on monitoring and management of video surveillance and security systems" for the speciality "Mobile communications and Internet", "Master" educational degree;
- "5G and smart technologies" for the speciality "Information technologies", "Master" educational degree.

In the period 2018 - 2022 the candidate has been scientific supervisor of 1 student in "Professional Bachelor" educational degree and 10 students in "Master" educational degree, who have successfully defended their diploma theses. Besides, assoc. prof. eng. Grigor Mihaylov, PhD, is co-organizer of the student Workshop UTP.ON, UTP coordinator on the internship program of Bulgarian National Television „TV Academia“, as well as Erasmus expert of UTP, responsible for incoming and outgoing students.

5. Description and significance of the submitted scientific papers/publications

Among all 38 scientific works, accepted for reviewing, assoc. prof. eng. Grigor Mihaylov, PhD, is an independent author in one publication and in 7 publications he is the leading co-author. For the other publications no separation protocol for the shareholding of the authors has been presented, therefore the shareholding of the authors in the collective scientific works should be considered as equal.

Indisputably all publications are in a topical scientific-applied field, they are presented at authoritative international forums and most of them are indexed in world-recognized databases with scientific information or in monographs and collective volumes. Also, the analysis of the content of the scientific works, submitted for review, reveals the logical connections among them and the sequence of conducted research stages. These facts demonstrate that the results of the candidate's intensive research activity are his personal work and not only became known to the scientific community, but also they have received recognition.

Assoc. prof. eng. Grigor Mihaylov, PhD, has participated actively in the development of the following specialized laboratories: a laboratory for video surveillance systems, a laboratory in the field of optical and satellite communications and sensor networks, a laboratory in the field of satellite and communication radio technical systems, a laboratory in the fields of Artificial Intelligence and Cloud technologies, as well as in the building of a complex security system for the needs of UTP (Stage I). During the last four years the candidate has participated in 4 scientific projects of the department "Telecommunications" with UTP. Besides, assoc. prof. eng. Grigor Mihaylov, PhD, is a member of the Organizing committee and the Editorial board of the International Scientific Conference TIEM, as well as of the Organizing committee of a Student scientific session.

Especially it should be noted that three documents for the protection of intellectual property were submitted for the competition.

The significance of the contributions in the scientific works of assoc. prof. eng. Grigor Mihaylov, PhD, ensues from the following circumstances.

Firstly, the scientific production of the candidate is presented at authoritative scientific forums.

Secondly, up to now the candidate has participated in 4 research projects, which have been completed successfully and on time.

Thirdly, all the known at the moment 32 candidate's citations, are made on scientific forums, indexed by Scopus and Web of Science. This demonstrates that the candidate has obtained and published considerable results, which have deserved the recognition of the scientific society.

Fourthly, at the moment the educational materials, laboratory setups and software products, developed by assoc. prof. eng. Grigor Mihaylov, PhD, are used by graduate and post-graduate students and PhD students in the field of communication and information systems and devices in UTP and in other technical higher schools.

Fifthly, the effect of the implementation of the research exploration results of assoc. prof. eng. Grigor Mihaylov, PhD, is expressed mainly in elaboration and enrichment of the laboratory-educational base for preparation of engineering staff, exploiting communication and computer systems and devices, used in the telecommunication systems of Republic of Bulgaria.

6. Synthesized assessment of the main scientific and applied contributions of the candidates

The contributions of assoc. prof. eng. Grigor Mihaylov, PhD, can be summarized by areas as follows:

6.1. Scientific, scientific-applied and applied contributions in the field of communication systems' theory:

6.1.1. Algorithms and simulation models of teletraffic systems of fifth generation (5G) networks, intended for the exploration and assessment of probabilities of rare events, are substantiated [5, 6, 20];

6.1.2. A teletraffic model of optical lines and devices for UBcN networks, reducing the time and resources for refinement of next generation telecommunication devices is suggested [6];

6.1.3. An algorithm for synthesis of complex phase-manipulated signals with near ideal autocorrelation function, which can be processed with small losses from the point of view of signal-to-noise ratio, is substantiated [28];

6.1.4. The interferences for receivers of global navigation satellite systems' signals, caused by terrestrial radio-communication systems, are analyzed [17];

6.1.5. The possibility for improving the performance characteristics of single frequency networks by synchronization of the transmitters on the base of information, provided by the single frequency adapter, is substantiated [9, 33].

6.2. Scientific, scientific-applied and applied contributions in the field of communication networks:

6.2.1. Algorithms for power management, providing efficient allocation of resources and protection of the cellular layer from interferences, caused by a local traffic, are substantiated [34, 35, 38];

6.2.2. The possibility for increasing of energy and spectral effectiveness of the cellular radio networks by a joint usage of "device-to-device" communication and network coding is substantiated [35];

6.2.3. The requirements to the new network radio interface of the 5G mobile networks as well as the technologies, enabling the upgrade to the next generation, are analyzed [1, 13, 21, 38];

6.2.4. A structure of an urban radio relay network is proposed [12, 13, 14].

6.3. Scientific, scientific-applied and applied contributions in the field of smart energy networks' management:

6.3.1. Algorithms for managing household energy consumption using different types of access networks and communication protocols are substantiated [8, 15, 29];

6.3.2. The performance parameters of a single-phase inverter used in photovoltaic systems are analyzed and evaluated [24, 26, 31];

6.3.3. The potential of the Republic of Turkey for development of electricity generation from offshore wind farms is analyzed [2, 3];

6.3.4. The most frequently used cyberattacks are analyzed and countermeasures for minimizing the impact on corporate environments and smart energy grids are systematized [23, 25].

6.4. Scientific, scientific-applied and applied contributions in the field of information technologies application in the Higher schools

6.4.1. Approaches and methodologies for engineer staff preparation, exploiting telecommunication systems in Republic of Bulgaria, are substantiated;

6.4.2. Stands, simulators and systems for electronic support of the education in the higher technical schools of Republic of Bulgaria are designed and implemented practically [22].

From the analysis of the scientific production of assoc. prof. eng. Grigor Mihaylov, PhD, the following conclusions can be made:

Firstly, the scientific, research and applied contributions are expressed in proving with new means essential new aspects of already existing scientific fields, problems, theories, hypotheses; creating new classifications, methods, constructions, technologies and obtaining confirmative facts.

Secondly, assoc. prof. eng. Grigor Mihaylov, PhD, has in-depth knowledge of the scientific specialty of the competition and can independently solve actual scientific and research tasks at a high scientific level.

Thirdly, the candidate can lead scientific teams, generalize the results of scientific researches and present them in an adequate form for teaching students, post-graduate students and PhD students and other scientific and technical engineer personnel.

7. Main critical remarks and recommendations to each candidatey

All materials, presented at the competition, are very well designed and are accompanied by references, certificates and other documents. However, to the research work and scientific production of assoc. prof. eng. Grigor Mihaylov, PhD, the following recommendations can be made, which may be useful in his future work.

Firstly, among presented 38 scientific works only one is prepared without co-authors. In view of this, a higher activity for independent publishing of scientific research results in Bulgarian and foreign journals, including such with impact-factor or impact-rank, is necessary.

Secondly, the candidate should pay more attention to supporting the development of the PhD students of UTP.

8. Conclusion

The facts in the materials, presented at the competition, can be summarized as follows.

Firstly, assoc. prof. eng. Grigor Mihaylov, PhD, develops versatile and meaningful educational and pedagogical activities.

Secondly, he has published articles and reports at a high scientific level.

Thirdly, his scientific production is characterized by significant scientific, research and applied contributions.

Fourthly, the scientific production and his professional realization show that assoc. prof. eng. Grigor Mihaylov, PhD, is a complete and approved scientist with authority and he is a high qualified lecturer in the area of the competition and his qualities correspond truly to the requirements of the LDASRB, the Rules for applying of the LDASRB and the PRASDOAP of UTP.

Fifthly, the admitted weaknesses do not detract from the significance of the scientific results obtained by the candidate and, moreover, can be easily remedied in his future work.

Comprehensively assessing all the works, presented by the candidate, I consider that they fully correspond to all the regulatory requirements for occupying the academic position "Professor" in the professional direction 5.3 "Communication and Computer Technics", scientific specialty "Theoretic basics of the communication technics".

Having in mind all the above stated, I propose assoc. prof. eng. Grigor Yordanov Mihaylov, PhD, to be elected for "Professor" in the field of higher education 5 "Technical sciences", professional field 5.3 "Communication and Computer Technics", scientific specialty "Theoretic basics of the communication technics", educational disciplines "5G mobile networks" and "Protection of the wireless networks" at the University of telecommunications and post.

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City of Shumen

