

REVIEW

by

**Prof. dts eng. Raycho Todorov Ilarionov,
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***of the materials submitted for participation in a competition for the academic
position of "professor" in the field of higher
education - Technical Sciences, in the professional field -***

5.3. Communication and Computer Engineering.

***In the competition for a professor, announced in the State Gazette, issue 85 /
08.10.2024 and on the website of the New Bulgarian University - Sofia for the
needs of the Department of Telecommunications,
the sole candidate is***

Assoc. Prof. dr. eng. Rosen Ivanov Pasarelski

I. Assessment of compliance with the minimum national requirements and the requirements of the New Bulgarian University

To participate in the competition for the academic position of "Professor", the candidate has submitted a monographic work and 29 scientific publications for review. All submitted works are related to research and teaching activities in the scientific field of the competition. Attached are:

- management of 1 educational project;
- participation in 9 national research projects;
- participation in 1 international research project.

The minimum requirements for the group of indicators of category "A" (50 points) are covered by the candidate's doctoral dissertation.

To cover the minimum requirements for the group of indicators of category "B", the candidate submits a monograph (100 points).

From the 29 publications submitted, the candidate collects a total of 365 points and exceeds the requirements for indicator "D" with a minimum requirement of 200 points according to the standards for occupying the academic position of "professor" in direction 5.3 "Communication and computer technology", consistent with the requirements of the PPZRASRB and the regulations of the NBU.

The group of indicators "D" the candidate applies 46 citations in scientific publications, referenced and indexed in world-renowned databases with scientific information, of which he collects 161 points with a minimum requirement of 100 points.

To meet the minimum requirements for a group of indicators of category "E" (minimum 150 points), the candidate provides information on participation and leadership in national or educational projects, participation in an international research project, 2 published textbooks used in the school network. In total, the candidate forms 210 points for indicator E.

According to the indicators from group "G", the candidate has implemented a research program in the field of modern 5G mobile cellular systems, membership in national and/or international organizations and associations in the relevant professional field, participation in 1 research or creative project outside of those specified in indicators 18 and 19, applied scientific research results in practice, certificate of a public lecture held on behalf of NBU at the invitation of a higher education institution or prestigious national/international organizations, initiation/active participation in the creation of a successfully launched new program, participation in improving a program and developing courses for a program, organizing and conducting a university-wide scientific seminar, a scientific conference at NBU, proven professional applied skills in the relevant scientific field and professional field. According to this indicator, a total of 200 points are collected out of the required 70 points.

Summary table for fulfilling the minimum criteria for holding the academic position of "Professor"

<i>A group of indicators</i>	<i>Minimum requirements</i>	<i>Achieved by the candidate</i>
A (Indicator 1)	50	50
B (Indicator 2)	0	0
C (Indicator 3 - 4)	100	100
D (Indicators 5 - 10)	200	365
E (Indicators 11)	100	161
F (Indicators 12 - 20)	150	210
G	70	200
H	70	160
I	70	130
Sum of indicators from 29 to the end (mandatory for NBU)		

After reviewing the documents and their compliance with the regulatory criteria, it is clear that the candidate meets and even exceeds the minimum requirements for holding the academic position of "professor", defined in the The Law on the development of the academic staff in the Republic of Bulgaria and the Regulations for its implementation.

II. Research (creative) activity and results

1. Evaluation of the monographic work

The monographic work of Assoc. Prof. Dr. Rosen Pasarelski is in the field of 5G mobile cellular systems and the study of the interaction between 4G-LTE and 5G systems in their architecture, network functions, interfaces and protocols. The research includes an assessment of the core networks, radio access networks, as well as aspects such as radio resource management, security and multiple access methods. The work is a study of contemporary problems and solutions related to the functionality and interaction of the network architectures of 4G and 5G systems. The achieved results are beneficial both in scientific and applied aspects. The monograph is distinguished by its methodical nature and is based on an extensive set of scientific literature and resources (a total of 85 sources). Mathematical models of multiple access methods have been developed, analyses based on numerical results have been made. Comparative analyses have been prepared for the optimization of radio signaling in 5G networks, which gives additional value to the research. The architecture of 5G systems for time-sensitive communications and industrial automation has been studied.

The topic of the monographic work of Associate Professor Dr. Rosen Pasarelski is very relevant and innovative, and has high scientific and applied value.

2. Evaluation of the author's scientific and applied scientific contributions

The evaluation of the author's scientific and scientifically applied contributions can be considered in the following aspects:

Scientific contributions:

1. A mathematical model for optimizing radio signaling capabilities in 5G systems is presented;
2. A theoretical assessment of the architecture of 5G systems for time-sensitive communications and industrial automation is made.

Contributions of a scientifically applied nature:

1. Research and analysis of the main channels, interfaces, functions and protocols for connection and communication between various network components in a 4G - LTE network and analysis of the security architecture of the radio access network and the core network are presented;
2. Research and analysis of the network functions and objects, the protocol stack and reference points in the network architecture in 5G systems are presented;
3. Analysis of service management and quality, control, audit, authentication and interaction between 4G and 5G networks is made;
4. Research and analysis of non-orthogonal multiple access (NOMA) and transmission principles in 5G systems with non-orthogonal multiple access are presented.

I accept the contributions thus proposed and evaluate them positively from a scientific and scientifically applied perspective.

3. Evaluation of the contributions in the remaining attached publications made after acquiring the academic position of "associate professor"

Publications attached outside the monographic work made after the appointment to the academic position of "associate professor" can be divided into the following groups:

- [1, 3, 5, 9, 15, 17, 18, 19, 20] - Mobile 5G cellular systems, architectures of mobile systems and radio communications;
- [3, 8, 21, 25, 29] - Network security - cryptography and cybersecurity;
- [6, 7, 9, 10, 11, 22, 24, 26, 27] - Network technologies and devices and concepts of storage systems;
- [12,13, 23, 28, 29] - Technologies and assessment of the quality of information transmission via Internet protocol;
- [14, 23] - Risk analysis and simulations in communication systems;
- [2,21] - Artificial intelligence and innovative IoT and LoRa technologies;
- [4] - Educational research and career development;

Key aspects of 5G networks are analyzed, including functions, interfaces, architectures, multiple access, mobility management and radio coverage.

Methods for ensuring network security through cryptographic algorithms and strategies for protection against cyber threats are studied. Encryption mechanisms in 5G and VoIP are analyzed, as well as new approaches to signaling protection.

The effectiveness of various data storage architectures and their integration into network environments is analyzed. The research offers solutions for improving the performance and efficiency of modern communication devices.

Data transmission technologies over Internet Protocol, such as VoIP and IPTV, are analyzed and evaluated. The research examines the factors affecting the quality of information transmission and proposes methods and models for their optimization.

Risks in communication systems are analyzed through simulation models. The research examines probabilistic approaches for assessing the reliability and resilience of networks.

The application of IoT, LoRa and artificial intelligence in communication systems is studied and analyzed. The research focuses on their role in network optimization and increasing security through developed models and algorithms.

Trends in educational development and professional realization of specialists in the field of telecommunications are analyzed. The research emphasizes the relationship between academic training and a successful career.

In summary, I believe that the contributions in the presented publications can be defined as scientific and applied science, and all of them fall into the field of professional direction 5.3 "Communication and computer engineering".

4. Citations by other authors

In connection with the current competition for the academic position of "professor", a reference and analysis of citations of publications authored by Associate Professor Dr. Rosen Ivanov Pasarelski is presented. The data show that there are 46 references to his publications.

The total number of points collected from these citations amounts to 161, with a minimum requirement of 100 points according to the standards for occupying the academic position of "professor" in the professional field 5.3 "Communication and Computer Engineering", consistent with the PPZRASRB and the requirements of the NBU.

5. Evaluation of the results of participation in research and creative projects and application of the obtained results in practice

Assoc. Prof. Dr. Rosen Pasarelski presents information on participation in national and international research and educational projects, as follows:

- participation in 9 national research projects;
- participation in 1 international research project;
- leadership of 1 educational project.

His involvement in a total of 11 national and international projects related to current topics such as 5G and IoT systems, measurement of the impact of electromagnetic fields and projects for optimization of wireless communications proves his activity and expertise in these areas, as well as the application of the obtained results in practice. He participated in an international project funded by the European COST program, where he was engaged in high-level scientific research and cooperation with researchers from other countries.

The publications resulting from his participation in scientific projects and which are indexed in the world-famous SCOPUS database highlight the relevance of the candidate's research work and his presentation in the international scientific community.

The overall assessment of the results of the participation of Associate Professor Dr. Rosen Pasarelski in research and educational projects is high. The obtained scientific and practical results have significant capacity for application in various fields of telecommunications and could be useful for specialists in industry and academia.

III. Educational and teaching activities

Classroom and extracurricular employment, work in the electronic learning module "MOODLE - NBU", provision of student practices and internships, work with students and doctoral students.

The pedagogical activity of Assoc. Prof. Rosen Pasarelski is very diverse and intensive. It covers basic disciplines in the Bachelor and Master programs such as: "Installation and Configuration of Computer Systems", "Computer and Communication Equipment", "Linux Server Systems and Applications", "Satellite and Cable Television" and others.

In addition to lectures, Assoc. Prof. Passarelski provides and supervises numerous student practices and internships.

For the last year, he has lectured in 2 disciplines in English at the Bachelor's level. In the doctoral program "Telecommunications", Assoc. Prof. Rosen Pasarelski also lectures and works actively with doctoral students. He is the supervisor of two successfully certified doctoral students. All disciplines led by the candidate are in the scientific field of the competition.

In addition, Assoc. Rosen Pasarelski actively develops electronic resources in education through the electronic platform MOODLE - NBU, where he provides authored teaching materials, video materials, prepares electronic tests and assignments for student coursework, etc.

His teaching work is highly rated by students, according to data provided by the NBU Quality and Assessment Center.

Over the years, Associate Professor Rosen Pasarelski has been the scientific supervisor of 90 graduates, a reviewer of 17 diploma theses, and has participated in 163 committees for state exams and thesis defenses.

This activity of the candidate defines him as an excellently prepared teacher, with the desire and capacity to develop new and attractive lecture courses for students.

IV. Administrative and public activity

Participation in collective management bodies of NBU

The administrative and public activity of Assoc. Prof. Rosen Pasarelski is related to participation in collective management bodies of the New Bulgarian University. He is a member of the Council of the Department of Telecommunications, contributing to the development of the department. He has held administrative positions as Director of the Bachelor's Program "Telecommunications", as well as Director of the Program Council of the department. Since July 2024, Rosen Pasarelski has held the position of Head of the Department of Telecommunications. Assoc. Prof. Rosen Pasarelski is also a member of the Faculty Council of the FDENO in NBU, as well as of the Academic Council of NBU.

The candidate's public work is also associated with editorial activity as the chief scientific editor of the Telecommunications Yearbook, indexed in CEEOL. He is a member of the editorial board of the scientific conference "Knowledge, Science, Technologies, Innovations", organized by the Institute for Knowledge, Science and Innovation in the city of Veliko Tarnovo and the international scientific program committee of the university scientific conference of the National University of Bulgaria "Vasil Levski".

As a representative of the National University of Bulgaria, the candidate represents the University in two professional associations - "ATI" (Alliance of the Technology Industry) and the "ASTEL" association.

The overall administrative and public activity of Assoc. Prof. Rosen Pasarelski can be highly appreciated and is fully related to the professional direction of the competition.

V. Personal impressions of the candidate (if any)

I have known Assoc. Prof. Dr. Rosen Pasarelski for a relatively short time.

From my contacts with him, I can note that he is communicative, which makes him easily accessible to both colleagues and students. As a new observer of his work, I can say that Assoc. Prof. Rosen Pasarelski possesses distinctive qualities of a leader and innovator, which will definitely contribute significantly to the future development of the department and the university.

VI. Opinions, recommendations and notes on the candidate's activities and achievements

My opinion regarding the candidate Assoc. Prof. Dr. Rosen Pasarelski can be summarized as follows:

- **Professional competence:** Assoc. Prof. Rosen Pasarelski demonstrates a high level of expertise in the field of telecommunications and computer systems.
- **Commitment to teaching:** The candidate demonstrates exceptional commitment to students, providing them with not only knowledge, but also practical skills. His desire to develop new courses and internships for students is commendable and shows a willingness to adapt to changes in the educational environment.
- **Participation in scientific and educational projects:** Assoc. Prof. Pasarelski's participation in various scientific and educational projects, both nationally and internationally, makes him recognizable as a specialist in the field of telecommunications.

I would make the following recommendations and notes:

- I would recommend the candidate to continue and expand their participation in international scientific projects and conferences.
- To deepen their work as a supervisor of doctoral students and to encourage students to participate in scientific research activities by providing them with the opportunity to participate in research projects.
- To commercialize and defend their scientific ideas and maintain good contacts with industry and the field of communication services.

CONCLUSION

Based on the analyses and assessments I have carried out in the review, I can state that the candidate Rosen Ivanov Pasarelski fully meets all mandatory legal requirements for holding the academic position of "professor", in accordance with the The Law on the development of the academic staff in the Republic of Bulgaria (ZRASRB) and the Regulations for its implementation, as well as the internal regulations of the New Bulgarian University.

In conclusion, based on all of the above, I highly rate the overall academic activity of the candidate. I personally support and recommend to the esteemed members of the Scientific Jury to support the candidacy of Associate Professor Dr. Rosen Ivanov Pasarelski for the academic position of "professor" in professional field 5.3. "Communication and Computer Engineering" at the New Bulgarian University, Department of "Telecommunications" and to be elected by the Academic Council.

Date 29.12.2024

Signature and
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