

REVIEW

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on the scientific papers for participation in a competition for
the academic position of "**professor**" at the New Bulgarian University - NBU
by professional field **5.3. Communication and Computer Technology**,
announced in the **State Gazette number 85/08.10.2024**

Candidate: **Assoc. Prof. Rosen Ivanov Pasarelski, PhD**

Grounds for preparing the review: participation as a member of the Scientific Jury,
according to Order No. Z-RK-84/18.12.2024 of the Rector of NBU.

Brief biographical data of the candidate: Assoc. Prof. Rosen Pasarelski obtained a master's degree at the New Bulgarian University in Telecommunications Systems and Technologies in 2003. He defended his dissertation in 2013 on the topic "Broadband radio systems and data transmission technologies. Design of a hybrid radio system. Efficiency in operation and implementation problems" under the doctoral program "Radio transmitting and receiving equipment". Since 2003, he has been an assistant professor in radio communications at NBU. Since 2015, he is an associate professor at NBU. He held the position of director of the bachelor's program "Telecommunications" at NBU. Since 2024, he is the head of the Department of Telecommunications of NBU.

The candidate shows professional interest in various areas: Radio Communications, Wireless Networks and Computer Systems, Mobile Communications, Data Centers, WEB Technologies and Services.

He is the author of over 90 publications, 2 monographs and 2 textbooks in the field of Technical Sciences. He has participated in a total of 12 international research projects and research or educational projects at the national and university level.

General description of the submitted materials:

- Self-assessment for long-term attestation of a full-time associate professor at the Department of Telecommunications;
- Minimum requirements for the scientific, teaching and/or artistic and creative activities of candidates for holding academic positions, in accordance with the requirements of the PPZRASRB and NBU;
- Published monographic work;
- 29 publications in refereed and indexed journals in world-renowned databases of scientific information, in non-refereed journals with scientific review or in edited collective volumes;
- Reference for original scientific contributions;
- 2 published university textbooks;
- Reference for citations of publications by Assoc. Prof. Rosen Pasarelski from the NBU library.

All submitted scientific works are in the scientific field of Communication and computer technology. They do not repeat the articles, papers and teaching books for the educational science degree "doctor" and the academic position "associate professor" attached to the competition documentation.

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

The competition for the academic position of "professor" is in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB) and the

Regulation on the Development of the Academic Staff (NRAS) of NBU, and is intended for the needs of the department of Telecommunications, Faculty of Distance, Electronic and Continuing Education (FDENO) of NBU.

The candidate's scientometric data exceed the minimum national requirements and the requirements of the NBU, which is evident from the table.

Group of indicators	Minimum national requirements and requirements of the NBU - "professor"	Assoc. Prof. Rosen Ivanov Pasarelski, PhD
A	50 т.	50 т.
Б	-	-
В	100 т.	100 т.
Г	200 т.	365 т.
Д	100 т.	161 т.
Е	150 т.	210 т.
Ж	70 т.	200 т.
З	70 т.	160 т.
И	70 т.	130 т.

The total number of points collected significantly exceeds the minimum required by law. With the submitted scientific publications and citations, with the published monograph and textbooks, with the participation in scientific research projects, with the active teaching and public activities, the candidate Assoc. Prof. Rosen Pasarelski fully meets the minimum national requirements for occupying the academic position of "professor" in professional field 5.3 "Communication and Computer Technologies" at NBU.

II. Research (creative) activity and results.

A total of 32 scientific works are submitted for review:

- Monographic work;
- 3 scientific publications indexed in Scopus;
- 26 scientific publications in peer-reviewed journals and conferences;
- 2 textbooks.

1. Evaluation of the monographic work, including an assessment of the author's scientific and applied scientific contributions.

The monograph work "New 5G mobile cellular systems. Study of the interaction between 4G-LTE and 5G systems: architecture, network functions, interfaces and protocols", 2024 with ISBN: 978-619-233-282-2 is a study and analysis of the architecture, network functions, interfaces and protocols of fourth-generation (4G LTE) and fifth-generation (5G) mobile networks and their interaction.

The monograph work has a total volume of 220 pages and includes 1 table and 23 figures. It ends with a conclusion, with which the author summarizes his research and analysis and systematizes his contributions to the work.

The author demonstrates in-depth knowledge in the field, skillfully studying the functions, interfaces and protocols of both systems, contributing to the expansion of knowledge in this dynamically developing field. The work not only clarifies the technical aspects of the systems under consideration, but also offers specific solutions for optimizing processes in 5G.

I accept the 23 contributions presented by the candidate in the monograph work and the 6 scientific and applied contributions summarized in the author's reference.

An important contribution of the monograph is in the presentation of mathematical analyses and models for optimizing radio signaling in 5G systems, which shows its scientific-applied side.

My assessment of the monographic work is high. It shows competence, innovation and high scientific and applied value, representing a significant contribution in the field of mobile communications.

I believe that the author's contributions are significant and have high scientific and practical value. The monograph enriches knowledge in the field of mobile communications.

2. Assessment of the contributions in the other attached publications made after the appointment of the academic position "associate professor".

The candidate's publications are distributed as follows: 3 are papers from international conferences, referenced in Scopus; 10 are articles in Bulgarian peer-reviewed scientific journals and 16 are papers from national conferences with peer-review. 8 of the candidate's publications are independent, and in 13 publications he is in first place. The candidate is the author of 2 published textbooks. Of the 29 publications submitted, 6 are published in English and 23 in Bulgarian. The candidate has intensified his publishing activity in recent years and has many publications after the announcement of the competition.

The scientific works submitted for review can be summarized in the following areas:

1. Mobile cellular systems;
2. Data centers;
3. Security in communications;
4. Voice transmission via Internet protocol - VoIP;
5. Optical devices;
6. Television via Internet protocol - IPTV;
7. Internet protocol version 6 - IPv6;
8. IoT Applications;
9. Antennas;
10. Professional realization in the field of telecommunications.

The first area includes 8 publications (1, 3, 5, 15, 17, 18, 19 and 20 from the competition list). In them, the use of neural network architecture to predict the attenuation of radio waves in 5G networks is proposed. A personalized encryption algorithm in 5G networks is developed and analyzed. The evolution of mobile cellular systems is studied. Methods for increasing capacity and improving radio coverage of mobile cellular networks in buildings are analyzed. Mobility management processes in 5G networks are studied. The architecture and network functions of 5G networks are analyzed. The stages of network planning for mobile cellular networks are studied. Femtocell technologies for mobile cellular networks are studied.

The second area includes 6 publications (6, 10, 11, 22, 26 and 27). In them, modern network concepts and protocols for data storage are analyzed. The architecture and infrastructure construction of data centers is studied. An analytical review of networked data storage technologies is made with an emphasis on the optimization of security and storage efficiency. The concept of creating an architectural model of a data storage system is analyzed. Data storage networks are studied, with an emphasis on interfaces and optimization. Aspects of implementing network-attached data storage systems are discussed.

The third area includes 4 publications (8, 14, 21 and 25). In them, modern technologies for ensuring the security of communication channels in public networks are evaluated. New methodologies for modeling and simulation of risk in telecommunication and insurance systems are analyzed. Applications of artificial intelligence and machine learning in the field of cybersecurity are studied. Security strategies are developed in various public networks and organizations.

The fourth area includes 4 publications (13, 23, 28 and 29). In them, modern protocols for voice transmission over the Internet are studied. The risks associated with VoIP systems are analyzed and methods for their management and minimization are proposed. Methods for measuring and assessing the quality of voice transmission over the Internet protocol are proposed. Mechanisms for protecting VoIP communications are proposed, with an emphasis on signaling protection.

The fifth area includes 2 publications (7 and 24). In them, optical devices with wavelength compression are analyzed. An evaluation of optical emitters and receivers is made.

The remaining five areas include 1 publication in each. In them, the processes of receiving and processing television content are analyzed. An evaluation of network performance when implementing IPv6 and SRv6 protocols in existing network infrastructures is made. The performance of LoRa technology for specific IoT applications, such as lighting monitoring, is analyzed. The influence of electromagnetic radiation on the functioning of antennas is studied. The professional realization of graduates in the field of telecommunications and computer technology is analyzed.

The received scientific-applied and applied contributions show that the work performed by the candidate as a lecturer and researcher is innovative and fully complies with the requirements for holding the academic position of "professor".

The results obtained have a complete form, include theoretical generalizations and solutions to scientific and applied problems that correspond to modern achievements, have practical significance and enrich existing knowledge.

3. Citation from other authors.

The presented reference for citations of publications by Assoc. Prof. Rosen Pasarelski from the NBU library indicates a total of 46 citations. Of these, 8 are in Scopus-indexed publications, 5 are cited in a scientific monograph, and the rest are in peer-reviewed publications.

The citations demonstrate the high quality of his scientific works, international recognition and high value of his scientific results.

The citations of the publications of Assoc. Prof. Dr. Rosen Pasarelski show that he is known to the scientific community in the country and abroad with the results of his research work.

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

The candidate has participated in a large number of scientific and educational projects. The competition documentation lists 1 international and 11 national projects.

Assoc. Prof. Rosen Pasarelski is participating in an international project funded by the COST program (Action CA 20129 - Multiscale Irradiation and Chemistry Driven Processes and Related Technologies (MultiChem) 2021 - 2025.), which promotes the coordination of scientific research and work on innovative projects. This participation shows his commitment to international research and his cooperation with researchers from different countries.

His participation in the project BG051PO001-3.1.07-0062 "Improving the interdisciplinary skills of telecommunications specialists", 2013 - 2015 of the Ministry of Education, Youth and Science, Operational Program "Human Resources Development" contributes to the adaptation of curricula. The project strengthens the links between the academic environment and business and develops interdisciplinary skills of students.

The participation in the project DFNI-B01/0017/27.11.2012 "Measurement, research, analysis and prediction of the impact of working electromagnetic fields of mobile devices on the health and quality of life of the population in densely populated areas" of the Scientific Research Fund, Ministry of Education and Science, emphasizes his commitment to the study of important public issues.

His participation in the project BG05M2OP001-2.002-0001 "Student Practices" - phases 1 and 2" 2016 - 2023, Ministry of Education and Science shows his involvement in the professional development of students.

The closest to the candidate's research activity is the participation in two research projects in cooperation with TU - Gabrovo - "Planning, design and optimization of wireless communication platforms, services and solutions for 5G and IoT", contract No. 2205E/2022 and "Development of IoT/4G/5G-based communication solutions for platforms, systems and services in a Smart City" contract No. 2403E/20224.

In summary, I can emphasize my positive assessment of the results of the candidate's participation in research and educational projects and the application of the obtained results in practice.

The candidate's scientific and applied activities may include participation in the organizing committees of conferences and in the editorial boards of journals.

III. Learning and teaching activity.

1. Auditory and non-auditory employment, work in the electronic training module "MOODLE - NBU", provision of student practices and internships, work with students and doctoral students.

Assoc. Prof. Rosen Pasarelski has a long-standing teaching experience in the Bachelor's and Master's programs in Telecommunications at NBU (21 years). He is a leading lecturer in a number of classroom fundamental courses: Installation and Configuration of Computer Systems, Introduction to Computer and Telecommunications Systems, Applied Software for Computer and Telecommunications Systems, Introduction to Mobile Communications, Fundamentals of Radio Communications, Wired and Wireless Networks, Wireless Data Networks, etc. He has taught several courses in English in NBU curricula. His intensive classroom work emphasizes his significant contribution to student education.

Assoc. Prof. Rosen Pasarelski's extracurricular work is related to student practices and internships. He actively organizes and coordinates internships in the laboratory environment of NBU and in cooperation with various industrial partners, which provides students with real experience and important skills necessary for a successful career in the telecommunications sector.

The active work of Assoc. Prof. Rosen Pasarelski with the electronic learning module "MOODLE" of NBU shows his commitment to innovative teaching and learning methods.

Working with doctoral students is another important aspect of the candidate's activity, which shows empathy for the development of new scientific personnel in the field of telecommunications. Assoc. Prof. Pasarelski is a scientific supervisor of two successfully certified doctoral students.

In summary, Assoc. Prof. Rosen Pasarelski possesses the necessary teaching skills and experience in working with students and PhD students.

2. Student survey ratings.

Assoc. Prof. Dr. Rosen Pasarelski has received extremely high marks from students in the Telecommunications programs, for the disciplines themselves, for him as a leading lecturer, and for the conduct of the classes.

IV. Administrative and public activity.

1. Participation in collective management bodies of the NBU.

Assoc. Prof. Rosen Pasarelski is actively involved in collective management bodies of NBU. Since 2003, he has been a member of the Council of the Department of Telecommunications. From 2005 to 2015, he was the director of the bachelor's program "Telecommunications". From 2021 to 2024, he was the director of the program council, and from July 2024, he is the head of the Department of Telecommunications. He is a member of the faculty council of the Faculty of Distance, Electronic and Continuing Education of NBU and participates in various attestation committees.

Assoc. Prof. Rosen Pasarelski actively participates in national organizations and scientific committees. He is a member of expert groups of the National Agency for Evaluation and Accreditation (NAEA). He is the editor-in-chief of the Telecommunications Yearbook, indexed in the Central and Eastern European Online Library (CEEOL), which supports the scientific production of the department. He is a member of the editorial board of the conference "Knowledge, Science, Technology, Innovation" of the Institute for Knowledge, Science and Innovation and of the international scientific program committee of the annual university conference of the National University of Science and Technology "Vasil Levski".

Assoc. Prof. Rosen Pasarelski represents NBU in professional associations such as the Alliance of Technology Industry - ATI and the Telecommunications Association - ASTEL, active until 2021. He actively participates in student recruitment campaigns, thereby promoting the university and the department's programs.

His public activity and his participation in collective management bodies of NBU, combined with his excellent academic competencies, correspond to the professional direction of the competition for "professor" and receive a high mark.

V. Personal impressions of the candidate (if any).

I do not know the candidate personally. My impressions after reviewing the submitted materials and reviewing his publications in various databases – NACID, Google Scholar, Scopus and Researchgate are that the candidate is competent in his field, conscientiously fulfills his duties and is familiar with the scientific sources and scientific achievements in the field of the competition.

I know colleagues of the candidate and can confirm that in the scientific unit where Assoc. Prof. Rosen Pasarelski works, a creative environment has been created for scientific research work, training and transfer of professional experience and knowledge to younger colleagues in the field of computer and communication technologies.

VI. Opinions, recommendations and notes on the activity and achievements of the candidate.

I have no significant critical comments on the materials of the competition and in particular on the scientific works of Assoc. Prof. Rosen Pasarelski.

I recommend that the candidate make efforts in the future to establish himself as a leading scientist in his chosen narrow scientific field, to publish in prestigious scientific journals and conferences, to intensify work with doctoral students and to strive for participation in international projects with related universities and scientific organizations.

CONCLUSION.

The candidate in the competition – Assoc. Prof. Rosen Pasarelski – has submitted the necessary materials and a significant number of scientific papers published after receiving the academic position of "associate professor". The candidate's works contain original scientific-applied and applied contributions. Theoretical research has practical applicability, and many of them are directly oriented towards academic work. The candidate in the competition meets the requirements for the academic position of "professor" according to the Law on Academic Affairs of the Republic of Bulgaria and the internal regulatory framework of the New Bulgarian University. I find no reason to doubt the presence of plagiarism in the scientific papers submitted for the competition, which is confirmed by their publicity, the specific approach and the new results obtained.

After reviewing the materials and scientific papers submitted for the competition, the analysis of their significance and the scientific-applied and applied contributions contained in them, I give a positive assessment and recommend that the **Academic Council of the NBU** elect **Assoc. Prof. Rosen Ivanov Pasarelski, PhD** in the academic position of "professor" in the professional field **5.3 "Communication and Computer Technology" at the "Telecommunications" Department, Faculty of Distance, Electronic and Continuing Education at NBU.**

15 January 2024

Signature
/Prof. DSc Seferin Mirtchev/