

OPINION

Assoc. Prof. Eng. Boyan Dimitrov Karapenev, PhD
Technical university of Gabrovo,
professional field 5.3 "Communication and computer technology";

on a competition for the academic position of "professor" at NBU,
field of higher education 5. Technical Sciences,
professional field 5.3 "Communication and computer technology",
for the needs of the Department of "Telecommunications";
Announced in the State Gazette, issue № 85/08.10.2024
with candidate: Assoc. Prof. Eng. Rosen Ivanov Pasarelski, PhD

Reason: member of the Scientific Jury, Order № Z-RK-84/18.12.2024 of the Rector of NBU.

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

Upon review of the materials provided by the chairman of the scientific jury and candidate, including self-assessment, a monograph and scientific papers, reference for original contributions, author's documents and others, it was found that they are in full compliance with the minimum national requirements regulated in the Law on the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for its Implementation (PPZRASRB) and the Regulation on the Development of the Academic Staff (NRAS) of NBU.

According to the submitted reference and self-assessment, Assoc. Prof. Dr. Rosen Pasarelski fully meets and significantly exceeds the minimum national scientometric requirements for the academic position of "professor" in professional field (PF) 5.3 "Communication and Computer technology". The candidate's applied scientific papers reflect his active research activity and his significant contribution to the chosen field. They fully meet the requirements of ZRASRB and emphasize his competence and in-depth approach in his scientific work.

Based on the analysis of the materials and their compliance with all regulatory criteria and certain minimum national requirements established by the Law on the State Administration of the Republic of Bulgaria, as well as the internal rules of the National Academic Council of the Bulgarian University, the documentation provided by the candidate can be assessed as proper, detailed and fully meeting the necessary requirements for participation in the competition for the academic position of "professor" in PF 5.3 "Communication and Computer technology" at the New Bulgarian University.

II. Research (creative) activity and results

1. Assessment of monographic work

The monographic work of Assoc. Prof. Dr. Rosen Pasarelski, presented within the framework of the current competition for the academic position of "professor", "New 5G mobile cellular systems. Study of the interaction between 4G-LTE and 5G systems: architecture, network functions, interfaces and protocols" issued in 2024 and bears ISBN: 978-619-233-282-2 contains 294 pages. This monograph represents the essence and studies carried out focused on the key aspects of 4G and 5G mobile technologies. The author examines in high detail and deepening the architectures, functions of network components and security issues, including innovative mathematical analyses and models. Particular attention is paid to multiple access multiplexing and its application, as well as the optimization of radio signaling capabilities in 5G networks. The developments and the results achieved in the work are justified by reference to an extensive base of specialized scientific literature

which testifies to the extensive preparation and in -depth work and understanding of the topic by the author. The monograph impresses with its precision, analytical nature and significance for the professional field 5.3 "Communication and computer technology".

The work represents a significant scientific and scientific-applied contribution, offering new ideas and analytical models that enrich and develop the modern scientific level of mobile cellular communication technologies and their development.

In connection with this, I highly evaluate the scientific level of the monograph, as it demonstrates not only in-depth and specialized expertise but also contains essential contributions to science and practical applications in the field.

2. Assessment of the author's scientific and scientific contributions

The author's scientific and scientific-applied contributions can be appreciated and presented as follows:

- An analysis has been carried out of the main connectivity and communication interfaces, control and user plane functions and protocols, radio resource management, and security architecture in 4G-LTE networks. The carried out studies and the results achieved offer valuable information to optimize the functionality of the constituent network components.
- Mathematical analyses and numerical results on orthogonal frequency division multiplexing (OFDM) in LTE networks are provided. This includes also the development of models for OFDM and OFDMA systems, which is essential for improving the performance of communication networks and systems.
- Network features, functions and protocols in 5G, interactions between 4G and 5G networks and the next-generation architecture (NG RAN) have been studied. The work and research in the field offers a basis for future innovations and applications in new network technologies.
- The architecture of 5G systems specialized for industrial automation and critical applications and carried out studies demonstrating the practical aspects of his scientific achievements are presented.
- Significant research has been conducted on the principles of transmission in 5G systems with NOMA, including mathematical analyses for radio signaling optimization and comparative analysis between NOMA and OFDMA, providing new perspectives for improving the efficiency of network technologies.

I appreciate the author's contributions with high scientific and scientific-applied value, as it can be noted that they expand knowledge in the field of mobile communications and offer effective solutions for optimization and implementation of innovations in practice.

3. Assessment of the contributions in the other attached publications made after the appointment the candidate of the academic position "Associate Professor"

As the author of a total of 29 scientific publications presented at the "professor" competition, Assoc. Prof. Rosen Pasarelski shows a significant contribution in the field of communication and computer technologies. The publications cover a wide range of topics related to 5G technologies, the network security, optical systems and innovations in mobile communications. Some of the main highlights include:

- 5G technologies research - numerous publications, such as "Neural Network Architecture to Predict Radio Wave Attenuation in a 5G Network" and "Research on Network Functions and Reference Architecture of 5G Mobile Systems", show an innovative approach to the analysis and optimization of 5G networks. The author proposes new models and architectures that can improve the efficiency of mobile communications.
- Security in Communication Networks - Publications related to technologies for the protection of communication channels and VoIP networks emphasize the author's work in the network security survey. He develops and analyzes encryption algorithms, which is especially important in the context of modern cyberthreats and cyberdefend.

- Optical technologies and network solutions - research on optical devices and data storage technologies demonstrates the wide scope of the author's research interests. These publications offer practical solutions and innovations in optical communications and data storage.
- Applications of the Artificial Intelligence - publications viewing and presenting artificial intelligence applications and machine training in cybersecurity, emphasizing the author's innovative approach to modern technologies and trends.
- Educational innovations - some works focus on educational applications, which shows the author's commitment to the development of personnel in the field of telecommunications and computer technology.

In summary, the contributions reached of Assoc. Prof. Rosen Pasarelski in his 29 publications demonstrate a depth of knowledge and competences in areas important to the field of communication and computing technique while emphasizing his role as a closely specialized expert in the field.

4. Citation from other authors

In the competition for "professor" in PF 5.3 "Communication and computer technology", Assoc. Prof. Rosen Pasarelski PhD reports 46 citations in prestigious databases such as Scopus, EBSCO, CEOL, Google Scholar, based on a reference conducted by the NBU library. According to this scientometric indicator, the candidate has collected almost double the total number of points compared to the minimum required under the ZRASRB. These achievements emphasize the high quality of his scientific work and presence in the academics.

I can confirm that the scientific publications of Assoc. Prof. Rosen Pasarelski PhD have been cited and cited successfully by other authors and receive a positive assessment thanks to the significant contributions to them and the widespread recognition they have received.

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

Regarding the competition for "professor", Assoc. Prof. Pasarelski presents a list of participation in 10 national projects and one international one. This shows his active participation and significant contributions to the PF 5.3 "Communication and computer technology".

Several more important scientific-research projects can be noted, in which Assoc. Prof. Rosen Pasarelski PhD takes an active part as a member of the team:

- "Study of processes induced by irradiation and chemical reactions that occur on different temporal and spatial scales. Technological applications" - international project, funded by the scientific research fund under the European Cooperation in the field of scientific research and technology COST.
- "Measurement, research, analysis and prediction of the impact of the working electromagnetic fields of mobile devices on the health and quality of life of the population in densely populated areas - DFNI- B01/0017" - national project.
- National project BG051PO001-3.1.07-0062 "Improving interdisciplinary skills and interaction with business of telecommunications specialists", under the grant scheme BG051PO001-3.1.07 Updating curricula in higher education in accordance with labor market requirements".

Additionally, the candidate's participation in the project "Student Internships - Phases 1 and 2" shows his desire to lead students which is an essential role in their professional development.

I appreciate the participation of Assoc. Prof. Rosen Pasarelski PhD in research and educational projects that have significant practical application.

III. Learning and teaching activity - 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 PhD shows high professionalism, both in his classroom and extracurricular work. In the educational process, he actively participates in conducting lectures and seminar exercises, paying special attention to the individual approach to students and their understanding of the teaching material. As an extracurricular activity, Assoc. Prof. Pasarelski actively carries out consultations, gives and evaluates additional tasks, prepares students for various practical and training questions and participates in the development of projects related to his disciplines. Besides, Assoc. Prof. Pasarelski plays an important role in working with the electronic learning module "MOODLE - NBU", where he creates and manages content, provides online resources and tasks for students, striving to facilitate their e-learning and improve the learning process. He regularly updates the materials, creates forums for discussing educational issues and ensures constant communication with students. In addition, Assoc. Prof. Rosen Pasarelski actively participates in providing student internships and work placements, collaborating with various companies and organizations to provide his students with opportunities to gain practical experience in a real work environment. He actively monitors the activities of students during internships and work placements, providing them with advice and guidance. Assoc. Prof. Rosen Pasarelski also works with doctoral students, providing scientific guidance and consultations for the development of their research, helping with the preparation of scientific publications and actively participating in the organization of scientific forums.

All this is an indicator of high assessment and active engagement of the candidate in academic and teaching activities.

IV. Administrative and public activity

Participation in collective management bodies of the NBU

Assoc. Prof. Pasarelski PhD actively participates in the administrative and public work of the New Bulgarian University through various collective management bodies that play an important role in his professional development and interaction with the academic community. His role in these bodies includes:

- Department Council – Assoc. Prof. Pasarelski actively participates in the discussion and decision-making regarding the development of the Department of "Telecommunications" in which he is member.
- Faculty Council – Within the framework of the Faculty Council of the Faculty of Distance, Electronic and Continuing Education, Assoc. Prof. Pasarelski actively participates in the strategic planning of the educational and scientific activities of the faculty.
- Program Council – as the Director of the Program Council of the Department of Telecommunications, Assoc. Prof. Pasarelski is engaged in the development and improvement of the curricula in telecommunications at NBU, monitoring their quality and relevance to the needs of students and the requirements of the modern labor market.
- Head of Department – from July 2024 Assoc. Prof. Pasarelski serves as the head of the Telecommunications Department, leading and coordinating the activities of the department, effectively organizing the educational process and scientific work, guiding his colleagues to achieve high academic results and supporting students in their studies.

The candidate's public activity, combined with his academic competencies, is in line with the professional direction of the competition to occupy the academic position "professor" and receives a high score.

V. Personal impressions of the candidate

Initially, I knew Assoc. Prof. Rosen Pasarelski PhD from his visits as a member and head of expert groups for program accreditation and now more in-depth than the submitted documents in the competition for the occupation of the academic position "professor".

My impressions for Assoc. Prof. Pasarelski PhD are completely positive - he is not only a prominent specialist in the field of PF 5.3 "Communication and computer technology" with his scientific and scientific-research work with high scientific achievements, a lecturer who inspires

students and actively supports them in their training and work, there are 2 textbooks issued with current and specialized content, there is extensive experience gained from their participation in various research projects, expert and working groups, he conducts specialized courses in English, gives public lectures on current topics and questions, has received high grades from the survey of students he is teaching, a member of various organizations and makes an impression with the extensiveness of his knowledge.

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

I would make the following recommendations on the applicant's future work and activity:

- I recommend that it continues to deepen its scientific and research work in PF 5.3 and develop current and future trends in communication and computer technologies.
- To actively continue to participate in the learning process, to update the educational content in accordance with modern scientific innovations, to participate in the development of new learning documentation and in other similar activities.
- I recommend continuing to actively include and work in international, national and university research projects, expert and working groups and in other similar guidelines.

CONCLUSION

In conclusion and based on all of the above, I highly evaluate the overall scientific and academic activity of the candidate and support Assoc. Prof. Rosen Ivanov Pasarelski PhD to occupy the academic position of "professor" in professional field 5.3 "Communication and computer technology" at the New Bulgarian University, Department of "Telecommunications" and I categorically and strongly recommend that he be elected by the Academic Council.

Date 10.01.2025

Signature

/Assoc. Prof. Boyan Karapenev, PhD/