

REVIEW

**from Prof. Seferin Todorov Mirtchev, D.Sc.
at the academic position of "professor" in a professional field
5.3. Communication and Computer Engineering
at the Technical University - Sofia**

**of the materials for participation in a competition for
the academic position of "Professor"
in the field of higher education - 5. Technical Sciences,
by professional field 5.3. Communication and Computer Engineering,
scientific specialty - "Communication Networks and Systems"
(Signals and systems, Radiocommunication equipment)**

In the competition for "professor", announced in the State Gazette, issue 50/15.06.2021 and on the website of TU-Gabrovo for the needs of the Department of Communication Equipment and Technologies at the Faculty of Electrical Engineering and Electronics, as a candidate participates Assoc. Prof. Stanimir Mihaylov Sadinov, PhD from Technical University - Gabrovo.

1. Brief biographical data

Assoc. Prof. Stanimir Sadinov, PhD was born in 1969 in the town of Veliko Tarnovo. He graduated with a master's degree from the Technical University of Gabrovo, specialty "Electronic Engineering and Microelectronics" (Specialization in Communication Engineering) in 1994. He defended his dissertation on "Investigation the possibilities for improving signal quality in cable coaxial television networks" in the doctoral program "Communication networks and systems" in 2006.

Since 2000, he has been an assistant in the department: "Communication equipment and technologies", Technical University of Gabrovo. Since 2009, he has been an associate professor in the same department. He is held the position of Deputy Dean. Since 2016 by now he is a head of the Department of Communication engineering and technologies at the Technical University of Gabrovo.

The candidate shows professional interest in various fields: signals and systems; communication circuits; television equipment; audio and video equipment; cable and satellite television networks; optical communication networks; mobile networks; satellite communications.

He is the author of over 100 publications and 7 textbooks in the field of technical sciences. He has participated a participant in 4 international research projects and 9 research projects at national and university level.

2. General description of the submitted materials

A total of 41 scientific works were submitted for reviewing:

- 14 scientific publications (habilitation work) indexed in Scopus and/or WoS;
- 13 scientific publications indexed in Scopus;
- 10 scientific publications in journals and conferences with scientific review;
- 2 textbooks and 2 books.

The candidate's publications are distributed as follows: 17 issues are articles published in international journals, referenced in Scopus and/or WoS; 10 papers are from international conferences, referred to in Scopus; 4 issues are articles in Bulgarian scientific journals with scientific review and 6 issues are papers at national conferences with scientific review. 5 of the candidate's publications are independent, and in 13 publications he is in first place. The

candidate is a co-author of 2 published textbooks and 2 books. From the 37 presented publications, 31 were published in English and 6 in Bulgarian.

All presented scientific papers are in the scientific field of Communication Networks and Systems. They do not repeat the articles, papers, textbooks and books attached to the competition documentation for the educational science degree "Doctor" and the academic position "Associate Professor".

The applicant's scientometric data exceed the minimum national requirements, as can be seen from the table.

Group of indicators	Minimum national requirements - "Professor"	Assoc. Prof. Stanimir Sadinov, PhD
A	50	50
Б	-	
B	100	219
Г	200	223.67
Д	100	208
E	150	325

The candidate fulfils the minimum requirements of TU - Gabrovo to the scientific and teaching activities of the candidates for the academic position "professor". He has 37 scientific publications for the competition, 27 of them are in the databases WoS and Scopus, 5 are independent, 3 are with IF, 14 are with SJR, there are 24 citations, 2 textbooks, 2 books, 4 successfully defended PhD students and 4 project and contract managements.

The above shows that with the presented scientific publications and citations, with the published textbooks and books, with the management of successfully defended PhD students and with the management of the research project, the candidate Assoc. Prof. Stanimir Sadinov, PhD fully covers the minimum national requirements for holding the academic position of "Professor" for the field of higher education "Technical sciences".

3. Reflection of the applicant's scientific publications among the scientific community (known citations)

A total of 24 citations are presented, of which 20 are in indexed publications in Scopus and/or WoS, 2 in publications abroad and 2 in publications in Bulgaria.

The citations of the publications of Assoc. Prof. S. Sadinov, PhD show that he is known to the scientific community in the country and abroad with the results of his research work.

The candidate has very good computer literacy and speaks good English, which allows him to carry out consulting activities in the training of foreign doctoral students in the department, as well as to maintain useful contacts and exchange of information with colleagues from abroad working in his research area.

4. Overview of the content and results in the presented works

The presented scientific works for review by Assoc. Prof. Stanimir Sadinov, PhD are summarized in three areas:

1. Signals and systems;
2. Radiocommunication engineering;
3. Optical and cable communication networks and systems.

The first area includes 11 publications. In them, they are realized simulation models and practical researches related to the processing and analysis of signals in various systems of telecommunications networks at data teletraffic. An approach for application of procedures for analysis of the impact of different types of noise in communications is presented. Simulation models are developed to identify noise signals with various shapes.

The second area includes 11 publications. In them, they are developed a platform for providing experimental access and applications testing and for evaluating the effectiveness of

technology and the quality of radio coverage provided in urban environments. Approaches for optimal planning of radio coverage in wireless communication networks are presented. Experimental models for research and analysis of terrestrial, cable and satellite digital television systems with possibilities for streaming, real-time monitoring and research of the processes of coding and modulation of digital signals are developed.

The third area includes 15 publications. Computer models of single-channel and multi-channel optical communication lines for high-speed signal transmission are developed. Solutions for optimal construction of optical networks are proposed. The efficiency of the optical networks and the quality of the transmitted optical signals are analyzed. The effect of nonlinear distortions on the channel spectra of coaxial cables and optical fibers is studied.

5. General description of the candidate's activity

5.1. Educational and pedagogical activity (work with students and postgraduate students)

Assoc. Prof. Stanimir Sadinov, PhD has a long teaching career in the Department of Communication Equipment and Technology at TU-Gabrovo (21 years).

He has led lectures, seminars and laboratory exercises in a large number of disciplines: "Signals and Systems", "Radiocommunication Equipment", "Television Equipment", "Satellite and Terrestrial Television", "Audio and Video Systems", "Cellular Communications", "Cable and Satellite Television Networks", "Broadband Mobile Networks" and "Satellite Communications".

He was Deputy Dean for Research and Personnel Policy at the Faculty of Electrical Engineering and Electronics and Head of the Department of Communication Equipment and Technology. He is a co-author of 7 textbooks and books in the field of technical sciences. He is the supervisor of four successfully defended PhD students, one with the right to defence and three who are currently studying.

He has developed curriculums in 5 disciplines: "Signals and Systems", "Radiocommunication Equipment", "Television Equipment", "Audio and Video Equipment" and "Cellular Communications". For the period from 2009 until now Assoc. Prof. Stanimir Sadinov, PhD has been academic advisor of a total of over 170 graduates in the bachelor's and master's degrees.

In his extracurricular work with students, Assoc. Prof. Sadinov, PhD was their research supervisor in their participation with over 10 papers at the Student scientific session of TU - Gabrovo and at the international scientific conference UNITECH. He has participated in the management and preparation of student teams with developments presented at the national competition-exhibition "Youth Technical Creativity" - Gorna Oryahovitsa (2017 - 2020), and in the Innovation Camp "Gabrovo Innovation Camp 2017-2020".

The candidate has actively participated in the expansion of the material and technical base in the laboratories at the Department of Communication Equipment and Technology at the TU - Gabrovo. From 2016 until now, the candidate has developed over 20 laboratory models and exercises in various disciplines.

5.2. Scientific and applied research activity

The candidate has participated in a large number of national and international scientific and educational projects. In the documentation for the competition are listed 9 national projects, of which in 4 he is a manager and in 5 - a participant. They are listed also 4 international projects, in 2 of which he is a coordinator, in 1 he is an expert and in 1 he is a participant. Two of the international projects are under the Horizon 2020 program, one is under the priority "Science with and for society", and the other is under the activities of Maria Sklodowska-Curie. The other two international projects are under the Interreg Europe program - one under the priority "Innovation and Knowledge Economy" and the second under the priority axis "Competitiveness of Small and Medium Enterprises". The candidate actively participates in the construction of the competence centre "Quantum communication, intelligent security systems and risk management" under the Operational Program Science and Education for Smart Growth.

To the scientific-applied activity of the candidate can be added his participation in the organizing committees of conferences and in the editorial boards of journals.

The candidate is a member of the Union of Scientists in Bulgaria and of the IEEE.

5.3. Implementation activity

As a result of the participation in the implementation of 9 research projects and the presented publishing activity, it becomes clear that the candidate in the competition has many years of experience in the design, construction and operation of communication networks and systems. Actively participates in the construction and modernization of laboratories and implements test systems in them, with which students and PhD students conduct their practical research on many disciplines: Signals and Systems, Radiocommunication Equipment, Television Equipment, Satellite and Cable Communication Networks, Cellular Communications. Uses specialized software products for design, monitoring, management, research and construction of wireless, cellular, satellite, cable and optical telecommunications networks. He also works actively as an expert in various projects with the business and the municipality of Gabrovo, related to the implementation of innovative technologies in the production and in the field of telecommunication services.

With the joint participation with the Municipality of Gabrovo, regional business organizations and development companies in the above three international projects, the applicant supports the implementation of innovations in production.

Information for participation of the candidate in a contract of NAVTECH GROUP EOOD for research of the possibilities for implementation of the product "Balanced system of efficiency indicators" of a project under procedure BG161PO003-1.1.07 "Implementation of innovations in enterprises" under OP Competitiveness is presented.

6. Contributions (scientific, scientific-applied, applied).

I have accepted the 23 contributions in the scientific papers presented by the candidate in the author's reference. I have categorized the contributions according to the materials submitted for review for participation in the competition as "scientific", "scientific-applied" and "applied" as follows:

- *Scientific contributions:*

1. An innovative approach for identification of Markov teletraffic circuits by means of multilayer neural networks with error back propagation and decision tree structure is developed;
2. An approach for application of procedures for analysis and study of the impact of different types of noise in communications is presented - uniform white noise, Gaussian white noise, Bernoulli noise and Poisson noise;
3. Approaches for optimal planning of radio coverage in wireless communication networks for different communication technologies are proposed;
4. Methodologies based on the iterative approach for optimal planning and sizing of the length and number of amplification sections in coaxial and optical transmission networks and systems are developed.

- *Scientific-applied contributions*

5. A simulation model in Matlab/Simulink environment for analysis of the bit error rate in different variants of digital phase modulation of the signals is developed;
6. Simulation models for identification of noise signals with different shapes with the help of LabVIEW and an adaptive neuronally fuzzy interface system are created;
7. Demonstration models of a radiocommunication multi-channel LoRaWAN gateway and of a LoRa-based communication platform for application in intelligent control systems is developed;
8. Models of wireless MIMO channel for communication in indoor environment taking into account the characteristics and spatial-temporal properties of the channel, the electromagnetic propagation of the signals and the parameters of the used antennas are synthesized;

9. Models for research, analysis and evaluation of the performance of high-speed single-channel optical networks using different formats for optical signal modulation and different dispersion compensation schemes are created;

10. Simulation models for research of signals in optical communication networks for solving optimization problems are developed;

11. Models for analysis of the reliability and fault tolerance of communication networks and systems are synthesized.

The obtained scientific, scientific-applied and applied contributions show that the work done by the candidate as a lecturer and researcher is innovative and fully complies with the requirements for holding the academic position "Professor".

The obtained results have a complete form, include theoretical generalizations and solutions of major scientific or scientific-applied problems, which correspond to the modern achievements, have practical significance and enrich the existing knowledge.

7. Assessment of the candidate's personal contribution

The researches, conclusions and contributions from the scientific production of the candidate are tested within national and international scientific journals and forums, indexed in Scopus or in Web of Science, which is a guarantee for the significance of the achieved results.

The candidate's publishing and research activities show his in-depth knowledge in various sub-areas of telecommunications, his ability to bring research to implementation, his active participation in teamwork and undoubtedly his merits for the results and contributions. The candidate is an established specialist and lecturer.

I inspected all the publications submitted for review and found that in all of them there are new results. 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.

8. Critical remarks and recommendations

I have no significant critical remarks to the materials of the competition and in particular to the scientific works of Assoc. Prof. Stanimir Sadinov, PhD.

I recommend the candidate to make efforts in the future to establish himself as a leading researcher in a narrow scientific field of his choice.

9. Personal impressions

I know the candidate from our joint work on a research project, when he was a chief assistant in the department of Communication Equipment and Technology at TU - Gabrovo. Then we have met at scientific conferences. My impressions are that the candidate is responsible, competent in his field, conscientiously performing his duties, knows the scientific sources and scientific achievements in the field of the competition.

10. Conclusion:

Having in mind the above, I propose Assoc. Prof. Stanimir Mihaylov Sadinov, PhD to be awarded the academic position of "Professor" in the field of higher education - 5. Technical Sciences, professional field - 5.3. Communication and Computer Engineering, scientific specialty - "Communication Networks and Systems" (Signals and systems, Radiocommunication equipment).

October 26, 2021

Reviewer: /signature/
/Prof. Seferin Mirtchev, D.Sc./