

OPINION

Authored by Assoc. Prof. Maria Valcheva Nenova, PhD, Technical University of Sofia,
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Concerning scientific works submitted for participation in competition for awarding
the academic position of “Associate Professor”
in the field of higher education – 5. Technical Sciences,
professional field – 5.3. “Communication and Computer Engineering”,
scientific specialty – “Communication Networks and Systems” (“Wireless Communications and
Broadcasting”, “Security equipment”)

In the competition for „Associate Professor“, announced in the State Gazette, issue 68/31.07.2020 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 **Ch. Assist. Prof. Krasen Kirov Angelov, PhD** – Technical University of Gabrovo.

1. An overview of the content and results of the submitted works

The candidate submitted 42 publications, 25 of which are published in English and 17 in Bulgarian language.

The precise and systematic formation of the presented works in 4 thematic areas is impressive. The first thematic area deals with problems in “Wireless Communications and Broadcasting”, and there are 7 author's publications in referenced editions. Solutions based on LoRaWAN technology are analyzed and presented – a platform is developed for providing experimental access and testing of applications, evaluation of the efficiency of the technology and the quality of provided radio coverage in urban environments; demonstration models are developed for educational and research purposes, using software-defined radio systems.

The second thematic area is about “Optical Communication Networks”, and the candidate has 10 publications related to it. The processes of modulation of the optical signals and the methods for compensation of the dispersion for large lengths of the optical lines are mainly studied. Solutions for optimal design of passive optical networks and for networks with optical amplifiers and regeneration sections are proposed. Numerous parametric analyzes are performed and optimization problems related to the selection of a combination of interdependent operating parameters in single-channel and multi-channel operation are solved. The efficiency of the optical network and the quality of the transmitted optical signals over long distances when using different modulation formats are studied and analyzed in detail.

The third area is “Systems and services in satellite and cable television networks” with 19 publications related to it. Experimental studies of the parameters and characteristics of the satellite channel for transmission of digital television programs in standard DVB-S/S2 are presented in this field. Simulation and experimental laboratory models with the necessary measuring instruments and software are synthesized. Experimental setups for research and analysis of terrestrial, cable and satellite digital television systems with possibilities for streaming, real-time monitoring and study of the processes of coding and modulation of the digital signal are developed. A comparative analysis of different methods for transmission of television programs is presented.

The fourth area focuses on the problems in the “Reliability and resilience of communication networks”. The candidate has 2 publications on this topic. A comparative analysis of several routing algorithms is presented and recommendations for their use according to the state and size of the network are proposed.

2. General characteristics of the candidate's activities

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

Ch. Assist. Prof. Krasen Kirov Angelov, PhD, has many years of experience as a lecturer in the Department of “Communication Equipment and Technologies” at the Technical University of Gabrovo.

During his educational experience as an assistant, Krasen Angelov has delivered practical learning content and laboratory exercises in the disciplines “Analog Circuitry”, “Signals and Systems”, “Digital Signal Processing” and “Design Automation” in the Bachelor's degree from the curricula of specialties “Communication equipment and technologies”, “Electronics” and “Automation, information and control equipment”.

For the last 5 years, he has been a lecturer in 4 disciplines in the Bachelor's degree in the specialties “Communication Engineering and Technology” and “Mobile and Satellite Communications” – “Wireless communications and broadcasting”, “Security equipment”, “Audio and video equipment” and “Cellular communications”, as well as 1 discipline in the Master's degree for the specialty “Communication Equipment and Technologies” – “Information technologies in communications”. He conducts laboratory exercises in the disciplines “Cable television networks” and “Broadband mobile networks” in the Master's degree, as well as in “Television equipment” in the Bachelor's degree.

Krasen Angelov, PhD is a co-author of 3 handbooks in 2 academic disciplines and has developed methodological materials for e-learning in 4 disciplines. He has developed curricula in 5 disciplines: “Wireless communications and broadcasting”, “Security Equipment”, “Access control systems”, “Audio and video equipment” and “Information technology in communications”. He actively participates in the development of curricula in 4 disciplines in the newly created in TU-Gabrovo specialties “Communication Technologies and Cybersecurity” and “Digital Administration” in the Bachelor's degree.

From 2016 until now Krasen Angelov was the supervisor of a total of 50 graduates (34 in the Bachelor's degree and 16 in the Master's degree).

In his extracurricular work with students, Krasen Angelov was their research supervisor in their participation with 8 reports at the Student Scientific Session of TU-Gabrovo and 1 report at the International scientific conference “UNITECH”. He was a supervisor of student teams with developments presented at the national exhibition and competition “Youth Technical Creativity” in Gorna Oryahovitsa (2017 – 2019), national hackathon “Academy of Innovation: IDEAS 2018” in Sofia, as well as in the “Gabrovo Innovation Camp 2018”.

The candidate has actively participated in the development of the material and technical base in the laboratories of the Department of “Communication Equipment and Technology” at the Technical University of Gabrovo. Since 2016, the candidate has developed and implemented over 20 laboratory models and exercises in various disciplines from the curricula of the specialty “Communication Equipment and Technologies”: models for monitoring and research of wireless communication channels and radio coverage quality in narrowband and broadband communication networks; demonstration modules of access control systems, fire alarm and security systems; models of systems for audio signal processing and ambient light effects in multimedia systems; simulation models and practical model of passive optical network, etc.

2.2. Scientific and scientific-applied activity

The candidate's publications are divided into 4 thematic groups: wireless communications and broadcasting (7 publications), optical communication networks (10 publications), systems and services in satellite and cable television networks (19 publications), reliability and fault tolerance of communication networks (2 publications).

Krasen Angelov, PhD meets the requirements, including the quantitative indicators for holding the academic position of “Associate Professor”, specified in the Regulations for awarding scientific degrees and holding academic positions at the TU-Gabrovo: 42 publications

are submitted for participation in the competition, of which 4 single-authored and 1 with Impact Factor, 10 citations from other authors and 3 published handbooks.

The publication activity of the candidate includes a total of 42 publications:

- 4 articles published in international journals, referenced and indexed in internationally acclaimed databases of scientific information (Journal of Engineering Science and Technology Review – JESTR and Journal of Engineering and Applied Sciences – ARPJ), 1 of which is in a journal with Impact factor (Journal “Electronics and Electrical Engineering” – “Elektronika ir Elektrotechnika”);
- 9 conference papers, which are referenced and indexed in internationally acclaimed databases with scientific information (ELECTRONICA, ELECTRONICS – ET, TELECOM), 2 of which are single-authored;
- 5 articles in unreferenced journals requiring scientific review (“Izvestia” of TU-Gabrovo, Journal of International Scientific Publications “Materials, Methods & Technologies”);
- 24 papers in conferences requiring scientific review TechCo – Lovech, UNITECH, ICEST, annual conference of “Angel Kanchev” University of Ruse), 2 of which are single-authored;

The candidate is a co-author of 3 published handbooks.

A list with the participation of the candidate in 4 national projects under the Operational program “Science and Education for Smart Growth” and 2 national projects under national “Scientific research” fund of Ministry of Education and Science, as well as in 4 university research projects (in one of which he is a head of).

Under the supervision of the candidate is in the period of realization university project 1910E, “Development and research of innovative information-based modules and systems for communication in the Internet of Things (IoT)” at UCNIT of TU-Gabrovo (2019 - 2021). The scientific results of this project are published in 6 publications focused on scientific and applied developments in the field of wireless communication networks, 4 publications focused on the modeling and optimization of optical communication lines and 1 publication related to predictive analysis of the reliability of communication systems.

K. Angelov has 8 verified reviews for the period 2017 – 2018 of publications in the international scientific journal “IET Electronics Letters” (with IF 1.231), he was as well a reviewer of scientific reports at the international scientific conferences “ELECTRONICS – ET” and “UNITECH”.

2.3. Implementation activity

The candidate did not submit official documents providing information about his implementation activities.

Nevertheless, as a result of the implementation of 10 research projects and the presented publishing activity, it is evident that in the last 5 years the candidate has participated in 3 applied developments with potential for implementation.

A demonstration model of a platform for providing experimental access for creating and testing applications for intelligent communication in IoT (Internet of Things) based on LoRa communication technology is developed – the platform is implemented for teaching and research purposes in Gabrovo and in particular at the TU-Gabrovo. Based on the platform, a demonstration service for intelligent parking management is developed.

On the territory of TU-Gabrovo is implemented and developed a practical model of passive optical network (PON) for delivery of interactive services. The model is capable to provide training, research and testing of new services.

A prototype of a system with interactive ambient LED light for mounting on flat displays and solid-state multimedia presentation screens is created at the Department of “Communication Equipment and Technology”.

3. Contributions (scientific, scientific-applied, applied). Significance of contributions to science and practice

As part of the objective evidence of the significance of scientific and applied contributions are citations to the candidate's works – 6 out of 10 citations are in publications referenced in global databases of scientific information (Scopus).

To the scientific-applied activity of the candidate can be included his participation in the organizing committee and as a lecturer in the international scientific forum “Models for implementation of innovative technologies in the context of Industry 4.0” – Gabrovo, held in 2018.

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

4. Assessment of the candidate's personal contribution

The publication activity of the candidate includes a total of 42 publications. Of these, 4 are single-authored, in 18 he is the first author, in 11 – the second author, in 9 – the third author and in 1 – the fourth co-author. This clearly determines the personal contribution of the candidate.

5. Critical remarks and recommendations

It is recommended for the candidate in the future to focus on publishing his research and results in publications with Impact Factor.

6. Personal impressions

The candidate has a very good level of computer skills 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.

The way of presenting and structuring the candidate's materials, as well as their popularization, also give me grounds to consider the candidate as a true professional and promising scientist.

7. Conclusion

Based on the acquaintance with the submitted scientific works, their significance and the demonstrated scientific and applied contributions, I find it justified and propose that Mr. Krasen Kirov Angelov, PhD be awarded the academic position of “Associate Professor” in the field of higher education – 5. Technical sciences, professional field – 5.3. Communication and Computer Engineering, specialty – “Communication Networks and Systems” (“Wireless communications and broadcasting”, “Security equipment”).

25.10.2020 г.

Member of the scientific jury: /signature/

/Assoc. Prof. Maria Nenova, PhD/