R E V I E W

On the competition for awarding the academic position of “Professor” for professional field 5.2. Electrical engineering, electronics and automation, specialty “Electronization", announced in the Government Gazette no. 38 / 10.05.2019.

Candidate: Assoc. Prof. Anton Slavchev Georgiev,D.SC, Department of Electronic and Microelectronics, Technical University of Varna.

Reviewer: Prof. Nikolay Dimitrov Madzharov, PhD, Department of Electronics, Technical University of Gabrovo

1. General considerations and biographical data

The 3-month competition for occupying the position “Professor” has been announced in the Government Gazette no. 38 / 10.05.2019 and published on the website of TU Varna on May 10, 2019.

Assoc. Prof. Anton Slavchev Georgiev from the Department of Electronic Engineering and Microelectronics, Technical University of Varna is the only candidate in the competition. He was born on 30.08.1960 in the city of Burgas. He graduated high school in Technical School of Mechanical Engineering of Burgas in 1979. He continued his higher education at the Technical University of Varna in the period of 1981 – 1986 and he received a master degree of Communication Technology. After that, he has been working as an engineer in a telecommunications company for two years. He was selected as an assistant in the Department of Communication Technology of the Technical University of Varna after a competition in 1988. He became a senior and then chief assistant until 1999. He was a chief assistant in the department of Electronics and Microelectronics in the period of 1999 - 2004. He habilitated as an associate Professor at the same department - scientific specialty "Electronics" in 2004.

His scientific research work began in 1989 as a full-time Ph.D student at the Department of Electronic Production Technology at TU Sofia and after that he continued as a part-time Ph.D student at TU Varna in the period of 1991 - 1993. He received his Ph.D degree from the “Higher Academy of Sciences” on the topic "Problems of the operational reliability of multiplexing telephone systems" in the scientific field "Communication networks and systems" in 1994. Assoc. Prof. Anton Georgiev continued his diligent work in this area and received his “Doctor of Science” degree in 2016 - diploma of TU Varna - HC - 2016 – 067; on the topic: "Development, research and analysis of new possibilities for increasing the operational reliability of electronic circuits"; in professional field 5.2. Electrical engineering, electronics and automation.

Assoc. Prof. Georgiev has had 31 years of academic experience since 1988. In this period, he had been lecturing and conducting laboratory exercises in 16 subjects in the Technical University of Varna, Technical University of Sofia, Technical University of Varna - Dobrich College, Institute of Microelectronics – Burgas, Burgas Free University. He is the head lecturer on the subjects - Electronics Design and Technology, Electronic Components, Electronics and Communication Design and Technology, Communication Equipment Design, Semiconductor Devices. Scientific content in some of these classes has editions in English.

In addition Assoc. Prof. Georgiev has wide range of administrative and public activities – supervisor of Educational and Methodology Department of TU Varna, Vice Dean of teaching work and Vice Chairman of the General Assembly in the Faculty of Electronics, expert in the accreditation board for participation in the procedure of appraisal and accreditation of higher education, Chairman of the Scientific and Technical Society "Electronics" - Scientific and Technical Unions Varna, chairman or member of scientific juries for obtaining various educational and scientific degrees

2. A general description of the presented materials

The candidate has submitted a list of 156 titles of scientific publications, included in the dissertations for the scientific degree "Doctor", "Doctor of Science", and procedure for obtaining an academic post of Associate Professor. In addition he has submitted 2 monographs, 6 textbooks and 15 study materials. One monographic work, 12 textbooks, 54 scientific articles and reports, a list of participation in 34 international, national scientific or educational projects are accepted for the attendance in the competition to fill the academic position "Professor". These scientific papers are not included in both Ph.D theses and the first habilitation and are taken into account in the final assessment. Overall 86 scientific papers on the two theses and the first habilitation are not reviewed.

Sixteen of the peer-reviewed scientific papers are published in scientific conferences and journals in Bulgaria, which are referenced in Scopus. Confirmation is pending for 2 of them (number 15 and 16 of the International Scientific Conference Electronics - ET2019, Sozopol), and there is no convincing evidence that article 12 was published in a refereed edition, except for the information “Scopus 2006” on the website of the magazine. The other 38 articles and reports have been presented at scientific forums in Bulgaria (30) and abroad (8), which are not referenced in world famous databases.

There are 39 works written in Latin characters and 31 works in Cyrillic; 12 are non co-authored, 15 with one co-author, 23 with two co-authors; other works are with three or more co-authors. The candidate is the main author of 35 publications and secondary of 21. There is no scientific work in Impact factor magazines.

3. General characteristics of the applicant's scientific research and applied activities

The scientific research and applied activities of the only candidate in the competition is in the field of the operational reliability of electronic components, devices and systems. New methods have been developed for modeling, investigation, and improving the technical parameters of electronic equipment components and units in order to reduce defects and sudden failures. Most of the analytical and experimental work has been implemented in engineering practices and industry.

The candidate Assoc. Prof. Anton Slavchev Georgiev has presented materials - monograph, scientific publications, reference for citations, participation in scientific projects, own lecture materials on different subjects, participation in the modernization of the material-technical basis and raising funds. Therefore the applicant fully covers the minimum national requirements for occupying the academic position of Professor, in the field of Technical Sciences in higher education - according to article 2b of the Rules for Implementation of the Academic Composition Development Law in the Republic of Bulgaria. The groups of indicators points, which the applicant has submitted evidence for, are presented in Table 1.

Table 1.

GROUP OF INDICATORS	NUMBER OF POINTS BY MAIN INDICATORS OF THE GROUP		NUMBER OF CANDIDATE POINTS	MINIMUM NUMBER OF POINTS PER INDICATOR OF A GROUP
А	А1	50	50	50
Б	Б2	100	100	-
В	В3	100	100	100
Г	Г6	30	484	200
	Г7	186		
	Г8	298		
Д	Д12	650	860	100
	Д13	210		
Е	Е16	40	871,7	150
	Е17	40		
	Е18	150		
	Е19	280		
	Е20	100		
	Е22	3		
	Е23	73,7		
	Е24	185		
Ж	Ж29	362	362	120

The summary of information is as follows:

Indicator group A – dissertation for occupying the “Doctor” degree (at least 50 points) - **50 points**;
Indicator group B - monograph (at least 100 points) - **100 points**;
Indicator Group C - a published book based on a dissertation thesis and scientific publications in peer-reviewed and non-refereed scientific peer-reviewed editions or in collective volumes. (at least 200 points) - one book and 54 pcs. publications (16 publications in peer-reviewed and 38 publications in non-refereed editions) with different number of authors - **514 points**.
Indicator Group D – Citations or reviewing in scientific editions, which are referenced and indexed in world famous databases or in monographs and collective volumes (at least 100 points) - 12 scientific publications cited 29 times in review scientific editions (290 points), 24 peer-reviews in refereed scientific journals, 4 textbook peer-reviews, 3 reviews of study materials, 2 reviews of laboratory exercises manuals, 3 reviews of research projects (360 points), 70 - citations of 35 scientific publications in monographs and collective volumes with scientific review (210 points) - **860 points**. Associate Prof. A. Georgiev has H index 3 as a result of his exhaustive research work, publications, and being cited by other authors.
Indicator Group E – research, development and implemented activity (at least 150 points); Thesis for “Doctor of Science”(40 points); one graduated PhD student (40 points); participation in 15 scientific or educational projects (150 points); participation in 14 international scientific or educational projects (280 points); leadership in 5 national science

or educational projects (100 points); project funds raised and managed by the candidate with a value of BGN 18720 (3 points); 3 textbooks used in schools (73.7 points); 12 educational materials used in schools (**871.7 points**)

Indicator group F - lecture hours at TU-Varna for the last three years (at least 120 points) - Semiconductor Elements and Analog Circuitry (18 hours), Electronics (56 hours), Communication Equipment Design (53 hours), Design and Reliability of Electronic Equipment (41 Hours), Semiconductor Devices and Technologies (27 Hours), Semiconductor Elements and Analog Circuitry (20 hours), Electronic components (42 hours), Analog circuitry (33 hours), Design and reliability of communication equipment (18 hours), Semiconductor devices and integrated circuits (38 hours), Design of electronic equipment (16 hours) - **362 points**.

In addition, there are 6 citations in US patents that are not taken into account when adding up the points of corresponding indicator group, but they are significant for the applicant's reputation in the scientific and business fields.

4. Pedagogical preparation and activity assessment of the candidate

The candidate for academic position "Professor" Assoc. Prof. Anton Slavchev Georgiev is a well-established lecturer with many years of lecturing at TU-Varna - over 15 years as a habilitated lecturer with a total of 31 years of teaching experience. He has lectured 16 Bachelor Degree courses and 2 Master's Degree courses since his habilitation.

For the competition the candidate participated with one monograph, 3 textbooks and 12 study- methodical materials, all of which were reviewed. The language and style of the author in the monograph is accurate and clear.

Over 70 undergraduates and one Ph.D student have successfully graduated under the candidate`s management. One Ph.D student is released with a dissertation defense and three are in an educational process.

Assoc. Prof. Georgiev has prepared educational programs for the disciplines: Design and Technology of Electronic Devices, Design and Technology in Electronics, Electronic Components, Design and Technology in Electronics and Communications, Design of Communicational Equipment, Design and Technology of Electronic Devices, Semiconductor Devices, Semiconductor Devices and others.

The candidate has good language skills. He has English level — B2 and satisfactory knowledge of Russian and German languages, which allow him to maintain useful contacts and exchange of information with colleagues from abroad working in his scientific field.

My conclusion is that Assoc. Prof. Georgiev has great authority in the academic community. His good teaching and pedagogical skills fully satisfy the requirements of Technical University of Varna for the academic position of "Professor".

5. Main scientific and scientific-applied contributions

The candidate has presented monographic work "Reliability of electronic products" in accordance with Art. 29, para 1, item 3 of the “Law for Academic Composition Development in the Republic of Bulgaria” and “Rules of Conditions and the Procedure for Occupying an Academic Position (RCPOAP)” in the Technical University of Varna. The topic of the presented monograph is extremely current, because of the increasing requirements for the reliability of electronic equipment. I believe that the **scientific**

contributions to this work can be summarized as follows: formulation of a new field in the theory and practice of the reliability of electronic products, concerning methodologies for assessing the reliability of new developing electronic products [chapters 8 and 9]; selecting the appropriate number of reserve electronic blocks, according to the overall system reliability level [Chapter 4]; selecting and normalizing the number of recoverable and non-recoverable reserve components [Chapters 4, 6 and 7]; determining the period of prevention [Chapter 10]; determining the technical resource and service life limit [Chapters 11 and 12]. **Scientific-applied contributions** are highly relevant and are applicable to the already established methods, in engineering, for the purpose of analyzing and guaranteeing a level of reliability of electronics products, specifically of multiplex communication systems, Doppler radars, electronics stage equipment, power supply systems, ect.

I accept the contributions, formulated by the author regarding the publications with which he is participating in the Professor competition - a total of 54 scientific articles and papers. **Scientific contributions** include the creation of a new theory, hypothesis and models for assessing the reliability of electronic components, parts, blocks and modules, that build more sophisticated electronic systems [IV.3.1.1, IV.3.1.3, IV.3.1.7, IV.3.1.8, IV.3.1.10, IV.3.1.11, IV.3.2.2, IV.3.2.31, IV.3.2.32, IV.3.2.34 - IV.3.2.38]; a new approach for assessing the reliability of lightning protection installations in power distribution substations and in particular of dischargers, made of metal oxide varistors [IV.3.1.2, IV.3.1.9, IV.3.2.8 - IV.3.2.32]; new methods for optimizing the maintenance of sophisticated electronic systems to improve reliability indicators [IV.3.1.6, IV.3.2.1, IV.3.2.7]; conditional probability algorithm and Bayesian empirical methods for obtaining a correct and relevant information, in cases when insufficient data are available about the reliability of an equipment [IV.3.2.3, IV.3.2.9 - IV.3.2.11, IV.3.2.28 - IV.3.2.30].

Scientific-applied contributions consist of applying the developed analytical method and obtaining confirmatory facts in the development and investigation of the reliability indicators of new and existing electronic devices. They can be summarized as follows: research, analysis and measures to improve the reliability of complex electronic systems with a network structure, in particular telecommunications systems [IV.3.2.5, IV.3.2.6, IV.3.2.8, IV.3.2.23, IV.3.2.27, IV.3.2.32]; medical electronic devices and apparatus [IV.3.1.3, IV.3.1.10, IV.3.2.9, IV.3.2.10, IV.3.2.11]; electronic stage effects devices [IV.3.1.7, IV.3.1.12]; an algorithm for design and optimization of impulse transformers is proposed, taking into account the relationship between the transformer design, electrical parameters and the magnetic core material [IV.3.2.16, IV.3.2.19, IV.3.2.20 - IV.3.2.22, IV.3.2.24, IV.3.2.26]; The indicator part of Doppler radar is developed on the basis of field-programmable gate array FPGA [IV.3.2.4, IV.3.2.33].

The scholastic methodological contributions are included in 3 textbooks and 12 educational materials presented by Assoc. Prof. Georgiev, as well as more than 10 developed curriculum and the established laboratories in the field of his educational work. In addition may be added the candidate activities in different commissions and committees for evaluation and improvement the quality of educational process of TU Varna, such as: participation in the team, which developed the basic documents for managing the educational process at the Technical University of Varna; organization of the practical training in the department “Electronic Technics and Microelectronics” - Bulgarian-language and English-language form; participation in the preparation of various documents for program accreditation, self-assessment reports, etc.

The scientific, scientific-applied, applied and scholastic methodological contributions are a personal work of the candidate and show that the work done by him, as a lecturer and researcher is innovative and fully corresponds with the requirements for the competition for the academic position of “Professor”.

6. Significance of contributions to science and practice

The scientific and scientific-applied research of Assoc. Prof. Anton Georgiev have contributed to the theory, practice and education, because they are dedicated to current problems of the development of modern electronics - analysis and methods for improving the reliability of electronic modules and systems with different structures. The importance of the created analytical method is significant, because it offers completed technical developments, some of which have been implemented in practice and others in implementation of 34 scientific or educational projects.

The author's contributions have become available to the scientific community in Bulgaria and abroad, through his publishing activity in prestigious journals and forums (totally 156 works, as 70 for the competition of academic position "Professor" - **Conferences:** ISSE 2004, 2017, Sofia; SIELA 2016, 2018, Burgas; ET 2011, 2017, 2018, Sozopol; IITI 2017, 2018 Varna; ELMA 2019, Varna, OPTIM 2002, Brasov; ICEST 2011, 2016, Ohrid; IC ”Thenonav” 2002, 2004, Constanta; Radioelektronika 2002, Bratislava; **Journals**: E+E 2003 “Computer Science and Communication” - 2012, 2013, 2014, 2015, 2016; “Hi Tech” 2017; Yearbook of TU Varna 2016). There are more than 100 citations. 12 candidate papers, which are submitted for the competition, have been cited 29 times in Scopus journals and conferences (IEEE Journal of Emerging and Selected Topics in Power Electronics 2019; International Frequency Control Symposium, 2011; The 23rd edition of Innovative Manufacturing Engineering & Energy International Conference 2019; SIELA 2016, 2018; ET 2018, ELMA 2019; Advances in Intelligent Systems and Computing 2018; Proceedings of the Institution of Mechanical Engineers 2017; IoTSMS 2018; ICIIS 2017, EPE 2018).

Furthermore, for Assoc. Prof. Georgiev's authority in the scientific community speaks the fact, that he is a member of the editorial committees of the journals - "Journal of Optimization", "Hi Tech Journal", "Computer Science and Communications", the conference "ET 2018" and a reviewer of articles in the journals "Journal of Quality in Maintenance Engineering", "Inderscience submissions", "Annual School Lectures Special". Of note, one of Assoc. Prof. Georgiev`s articles is defined as the most read article, written by a Bulgarian author in the world in 2017.

The presented quantitative indicators correspond with the criteria for occupying the academic position "Professor", which was discussed in details in item 3 of this review.

7. Critical notes and recommendations

1. I recommend that the applicant increase the work with the PhD students and improve the success rate with their dissertations, in order to pass his great experience and knowledge on to young educators in the Department of Engineering and Microelectronics at TU Varna.
2. It would be good to put more effort into preparing documents, such as: numbering the articles and citations; more specific information and evidence for indexing

articles and citations; most of the pages in the document “The author's view of completion the national scientometric standard” have poor print quality.

3. I recommend that the applicant increase his presence in the worldwide scientific community with publications in impact factor journals.
4. Most of the submitted citations for participation in the competition for academic position "Professor" are by the candidate`s colleagues of TU Varna (14 out of 29 citations. In my opinion, it is normal for a scientist of such rank to have a significant number of citations from his colleagues from other Technical Universities in Bulgaria.

The above notes don‘t detract in any way the good performance of Assoc. Prof. Anton Georgiev at the competition for occupying the academic position of Professor.

8. Personal impression and opinion of the reviewer

Neither have I personal impressions, nor cooperative publications and projects with Assoc. Prof. Anton Georgiev. My impressions of him are entirely based on the materials provided for the competition, the available professional information on the Internet and some scientific conferences in which he has participated – ICEST, ET, SIELA, ELMA. Based on this information, I believe that he is a well prepared educator on Electronics, in particular of Reliability of Electronic Elements and Systems. His large publishing activity indicates that he is an active researcher, who is on track with the innovations and achievements in his working field and has a vision for his future scientific research.

CONCLUSION

My general assessment is that the applicant's presentation in the competition for occupying the academic position "Professor" corresponds with the requirements of The Law for Academic Staff Development in the Republic of Bulgaria, Implementation Regulations of the Law for Academic Staff Development and Rules of the Conditions and Procedure for Occupying an Academic Position in the Technical University of Varna.

After reviewing the candidate`s scientific works for participation in the competition, scientific, scientific-applied, and educational-methodological contributions contained in them, I find it appropriate **to recommend** Assoc. Prof. Anton Slavchev Georgiev for the academic position "**PROFESSOR**" in the professional field 5.2 Electrical engineering, electronics and automation in the scientific specialty "Electronization" at the department "Electronic and microelectronics" of TU Varna.

Date: 09/09/2019r. **REVIEWER:**

/Prof. Eng. Nikolay Madzharov, PhD/