

OPINION

on the competition for the occupation of the academic position Associate Professor in the professional field 5.2. Electrical Engineering, Electronics and Automation, major - "Elements and Devices of Automation and Computing" (discipline "Digital Circuit Engineering" and "Impulse and Digital Devices"), an official gazette, pcs. 58 dated 23.07.2019 with candidate Chief Assistant Professor Eng. **Goran Danailov Goranov**

Gave the opinion: Prof. Siya Lozanova, Ph.D., Institute of Robotics - BAS.

1. Submitted materials in the competition: minimum national requirements, pedagogical activity, projects.

In the competition for associate professor, announced by TU-Gabrovo, of which I am an assessor, there is only one candidate chief Assistant Professor Goran Goranov. He has participated in 47 scientific papers, 11 of which are equivalent to monograph work and indexed in the world-famous Scopus and Web of Science databases, and 36 other publications - all outside his dissertation.

I can categorize posts in the following format:

- articles in peer-reviewed scientific journals and yearbooks - 16 (12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27)

- articles in international conference proceedings in Bulgaria - 9 (28, 29, 30, 31, 32, 33, 35, 36, 38).

Of the applicant's works, 6 are independent (12, 14, 16, 18, 21, 27), 21 are with one co-author (1, 2, 6, 7, 8, 10, 15, 19, 20, 25, 28, 30, 32, 34, 35, 37, 38, 41, 43, 44, 46) and 20 with more than two co-authors (3 - 5, 9, 11, 13, 17, 22-24, 26, 29, 31, 33, 36, 39, 40, 42, 45, 47). In 17 of the works (4, 8, 11, 15, 20, 25, 28, 31, 32, 34 - 38, 43, 44, 46) G. Goranov is in first place.

In the documents, Mr. Goranov provided a reference for a total of 17 citations.

My conclusion is that the candidate fully complies with the minimum national requirements for an Associate Professor, in accordance with the law. G. Goranov Ph.D. has defended his dissertation on the theme: "Development and research of a control system for transistor converters with electrotechnological purpose" (indicator A - 50 points). He has presented 11 articles equivalent to monograph work (indicator B - 270 points), 36 publications of which are under indicator D - 262 points, and 17 quotes indicator D - 83 points. more than 400 hours. Average classroom engagement with exercises is over 470 hours.

G. Goranov has participated in eight scientific projects at the department "national scientific fond" of TU-Gabrovo, one international and one at the Federal Research Institute. He is also associated with 4 other projects with the technology transfer industry. I will indicate his active role and initiative in the QUASAR project. According to the documents, with the assistance of the candidate, funds were provided from the Gabrovo industry for producing up a laboratory for the design of microprocessor devices in TU-Gabrovo.

2. Applicant's contributions and results.

I accept the reference to the formulated contributions and results of Mr. Goranov in his works. Generally, they are scientifically applied. Applied scientific contributions can be summarized and reviewed in the following thematic areas:

I. Information management and control systems.

* The "All-Digital PLL" method is formulated on the basis of digital synthesis of combinational, register and counting circuits for control of transistor resonant converters. For the first time, such a digital structure, made up of logical elements only, is applied to control technological processes in resonance inverter circuits. The parameters of the control system were studied when the digital schematic structure was changed [4, 12, 14, 18, 43].

* A cycle-by-cycle method for controlling a thermostat was synthesized by applying temperature feedback, reducing losses in the heating element and increasing the coefficient of thermal energy. The process of controlling a three-phase electric motor through mathematical analysis of MATLAB

is scientifically substantiated. Control of a three-phase CPLD-based electric motor has been developed, built as a "fuel pump" in a gas injection bottle operating in liquid phase (22, 24, 35).

* A digital module for dual-line matrix display control and digital driver for I2C communication, as well as EEPROM read/write have been developed. The CPLD can be used in the management process (19, 38,44, 45).

* A control system based on the ATmega 128 microcontroller and a computer with an operating system for measuring and calculating the area of leather have been implemented. An innovative approach has been taken by capturing moving skins with a camera. Object-oriented camera management software and USB connectivity with ATmega 128 controllers have been developed. The development was introduced in the production of Leder Trading Ltd., Gabrovo [6]. **In my opinion, this is the strongest contribution of the candidate.**

* A new approach has been developed to implement a battery management system for solar panels. It is mainly used in wind generators (10).

* Data processing and management system based on the Fuzzy controller developed and tested. It is used to cool Peltier elements when operating gasoline injectors and to operate brushless motors (7, 25, 28, 31).

II. Computer systems and applications - WEB based system and servers.

* An architecture has been developed to monitor the performance of HPC applications. Metrics that the end-user can use in their applications are defined. Implemented a parallel calculation of multi-core processors to reduce the simulation time for complex physical processes has made (1, 5, 22, 2).

* Sensor network with WEB interface is realized. Its potential for application in fields such as medicine, energy and general measurement systems has been explored (3, 26, 37, 39, 40).

* A web-based system for working time planning and a system that implements the evaluation model is implemented and implemented. The possibility of applying to an internal network on a local server (27, 33) is described.

* Improvements and optimizations for Java-based software for Windows are made. An algorithm for working with monitors in all ECG resolutions and printing has been added (8, 32).

* An infrared thermography method has been applied to investigate the wear of cutting discs (9, 15).

* A software application for mobile devices based on ABAP has been developed, implemented in an ERP system for automatic generation of information extracted from a database (36, 46).

* A model of two-collector magnetotransistor compatible with PSpice-based simulators has been developed (47).

III. Intelligent microprocessor systems.

* A microprocessor measuring system has been developed to study the parameters of galvanic magnetic sensors - magnetotransistors and Hall elements. A prototype two-collector magnetotransistor was studied and a comparative analysis of the results was performed with computer modeling (11, 17).

* A galvanic magnetic field measuring device has been developed that is used for contactless DC measurement. A variant for temperature compensation has been proposed for Hall sensor studies (13, 29, 30).

* Microprocessor systems have been developed - electronic leveling and electronic water meter based on magnetically sensitive sensors. Advanced features are offered, such as leakage protection and contactless reading of values (16, 21, 23).

3. Impact of contributions on science and practice.

Crucially important for the impact of applied research results is their reflection in the works of other researchers. According to the list provided to me, the candidate has 17 citations, 6 of which are in indexed editions. For the scale of the complex nature of the activity of the university lecturer, this is a completely satisfactory result. It is especially important for me that the applicant successfully manages and works with teams.

G. Goranov has implemented developments in manufacturing companies, and this technological transfer shows the effectiveness of its results and contributions.

The quantitative indicators for the job of the academic position "Associative Professor" at the Technical University of Gabrovo also observed.

4. Critical notes, recommendations.

I found spelling errors in the candidate's works, in some places the narration is structured poor, there are repetitions, etc., but these are natural ways in the creativity of every researcher. Important is the fact that there are no fundamental errors of a theoretical or applied nature. I believe that the candidate's Contribution Report can be much shortened and the results summarized appropriately. I highly admire the fact that G. Goranov Ph.D. has not "slipped" in the general practice of compiling and/or copying material from Wikipedia or sites in brochures of 100 - 110 pages, called monographs, which will guarantee automatic 100 points and eliminate the need for publications referenced in world databases. I have no joint publications with the candidate. I am not related to him in accordance with paragraph 1, part 5 of the Supplementary Provisions of the law. There is no evidence of plagiarism in his writings.

CONCLUSION

I commend the research and pedagogical activity of Ch. Assistant Professor Eng. Goran Goranov, who fully matches the requirements for the profession of the academic position "Associate Professor". Important scientific facts and results have been obtained. **I positively propose to the Honorable Jury and the Academic Council of TU-Gabrovo Ch. Assistant Professor Eng. Goran Danailov Goranov to employ the academic position of Associate Professor** in the professional field 5.2. Electrical engineering, electronics, and automation majoring in "Elements and Devices of Automation and Computing".

Sofia, November 24, 2019

Jury member: /signature/
/Prof. Siya Lozanova Ph.D./