OPINION

by Prof. Dr. Anna Vladova Stoynova, Technical University-Sofia
of the materials submitted for the competition
to occupy the academic position of Associate Professor in
higher education area – 5. Technical Sciences,
in the professional field - 5.2 Electrical engineering, electronics and automation, specialty -
"Elements and Devices of Automation and Computing"
(Impulse and Digital Devices, Digital Circuitry)

In the competition for associate professor, announced in the State Gazette, issue. 58 / 23.07.2019 and on the website of TU-Gabrovo for the needs of the Department of Electronics at the Faculty of Electrical Engineering and Electronics, with the participation of Assist. Eng. Goran Danailov Goranov Ph.D.

1. An overview of the content and results of the submitted works.
For participation in the competition, G. Goranov has presented a total of 47 scientific works, of which:
- 11 subjects are reports from international conferences that have been published in refereed editions, indexed in SCOPUS / WOS, as 2 of these have been published in Impact Rank Collections, published by the American Institute of Physics (AIP);
- 24 issues are in the publications of the National Reference List of Bulgarian Scientific Editions with Scientific Review, of which 8 are. reports from scientific conferences and 16 issues. (6 of which are separate, 15 are written in Bulgarian and 1 are in English) articles in magazines;
- 12 issues are papers in English in non-refereed collections with the scientific review of international conferences at home and abroad.
I accept all scientific papers submitted for review. 2 individual textbooks and 2 study guides with one co-author were presented. The candidate noted single quotations from Bulgarian authors of 17 of his publications, 6 of which in SCOPUS and one citation in a monograph.

2. General characteristics of the applicant's activities.
2.1. Educational activity (work with students and doctoral students)
The educational and pedagogical activity of the candidate in TU-Gabrovo is significant and diverse. In the period 2016-2019 Ch. Assistant Professor G. Goranov had a total of 1,421 hours of classroom work, ie an average of 355 teaching hours per year. He is the author and holder of 6 syllabuses, of which 1 for Bachelor's Degree Programs and 4 for Bachelor's Degree Programs at BN 5.2, as well as a co-author of 1 Bachelor's Degree Programs for Bachelor Degree Programs at BN 5.3. During the same period, he was the head of 21 undergraduate degrees and made 21 reviews. The applicant has actively participated in the construction of a new training laboratory on Designing Microprocessor Devices.

2.2. Scientific and applied scientific activity.
G. Goranov is a reviewer of a number of scientific papers in the UNITECH Conferences of TU-Gabrovo and the International Conference "ET" of TU-Sofia. He is a member of the Union of Scientists in Bulgaria.
A document certifying the applicant's participation in a total of 10 research projects after 2013 has been presented. (incl.), 7 of which are targeted by the state for TU-Gabrovo, 1 is from the NSF, 1 is a contract for the development of an autonomous management system and 1 is under the Operational Program "Science and Education for Smart Growth" 2014-2020.

2.3. Implementation activities.
Reference is made to the implementation of three developments in two companies, one DCC and one municipality. The following are developed and implemented: a web-based adaptive and well-timed information system for scheduling working hours and employment; machine for measuring and recording the area of leather production based on PLC controller and USB camera; a system for

monitoring the power and autonomous ignition of a gas generator, providing alternative power indefinitely.

3. Contributions (scientific, applied, applied). The importance of contributions to science and practice.

Applied scientific contributions are related to the development of new methodologies, software algorithms and architectures and tools to study new effects and to achieve better characteristics and parameters of the developed systems.

I accept the contributions in the applicant's copyright certificate, and summarize the applied and applied contributions by groups:

1. Resonance inverter control systems in a CPLD programmable environment

1.1 Improved functionality and parameters of digital PLL systems in PLD implementations are proposed, with different methods for digital frequency synthesis and innovative implementation of ADPLL. A methodology has been developed to calculate the parameters of the digital circuit for controlling resonant inverters to obtain the maximum frequency scanning range [4, 12, 14, 18, 43].

2. New digital modules and circuits implemented in CPLD.

2.1 Acyclic method for controlling a thermostat with improved parameters and easy connection to other digital systems has been researched and applied. [35].

2.2 A digital, step-change PWM has been synthesized and a PWM control for a three-phase electric motor has been developed, incorporated as a "fuel pump" in a gas-phase liquid-injection bottle, for the first time using the constant-value control method for a brushless electric motor. A MATLAB PWM design approach has been developed [20, 24, 35].

2.3 An algorithm has been proposed and a digital module for dual-line matrix display control and digital driver for I2C communication has been developed. Digital synthesis of a new model logic circuit for the HDB3 precoder in NRZ code has been performed [19, 38, 44, 45].

3. Control systems based on microcontrollers and PLCs.

3.1 Unique software algorithms and object-oriented camera management software have been developed to detect spots and holes in the skin and an original approach for measuring and calculating the area of skin in any shape and motion has been applied. The development was introduced in the production of Leder Trading Ltd., Gabrovo [6].

3.2 A new artificial intelligence approach is presented for the implementation of a microcontroller system for battery management for a solar system. The developed MPPT controller is designed to work with a SEPIC converter, which allows the use of various sources [10].

3.3 A Fuzzy Controller-based data processing and management system has been explored to create new software models for high-power conversion and energy transfer systems [7]. Different models of microcontroller-based control have been investigated. They have been applied in Peltier element cooling processes, gasoline injector operation and brushless motor control [25, 28, 31].

4. WEB-based system applications and servers.

4.1 Software architectures have been proposed for a G-Lite Grid-based Task Management Web Services module to monitor the performance of HPC applications [1, 2, 22].

4.2 The KNL processor performance is twice as good as that of the Ivy Bridge-EP processor when calculating the mathematical model of Gordon's 2D sine equation systems. Multi-core processor calculations are justified to reduce the simulation time for complex physical processes [5].

4.3 The possibility of realizing a sensor network with a WEB interface for application in areas such as medicine, energy and common measurement systems has been explored. An approach is proposed to programmatically configure the microcomputer to measure and operate as a web server using Apache, MySQL, [3, 26, 37,39,40].

4.4 A web-based system for working time planning and a system that implements the 360-degree feedback model has been developed and implemented. The possibility of its application on an internal network on a local server is described [27, 33]

5. Computer models and simulations.

5.1 The capabilities and applications of new ARM architectures are explored. An assessment and classification of the main characteristics have been made [32].

5.2 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 proposed [8].

5.3 The possibilities of using IP cameras for remote visual control of technological processes for biogas production in real-time, for an instantaneous reading of parameters, for the defect in laboratory installations have been explored [15].

5.4 A software application for mobile devices based on ABAP has been developed and implemented in an ERP system for automatically generating database information [36].

5.5 A model of two-collector magneto transistor compatible with PSpice-based simulators has been created. [47].

6. Intelligent microprocessor measuring systems - application contributions.

6.1 Specialized microprocessor measuring systems and devices have been developed - electronic leveling and electronic water meter, with the possibility of contactless reading of values, a galvanomagnetic device for measuring the magnetic field [13, 21, 23, 29, 30]

6.2 The functionalities of the Xilinx Spartan-3E system have been explored and a method of design in a development system has been proposed [16].

4. Assessment of the applicant's personal contribution.

The applicant's scient to metric data exceeds the minimum national requirements for occupying the academic position of "Associative Professor" and are: 50 points for group of indicators "A"; 270 points for "B" indicator group; 262.36 points; for group of indicators "D"; 83 points for "D" indicator group.

I appreciate the applicant's personal contribution as being relevant to the theory and practice of developing digital converter control systems, intelligent microprocessor measurement systems, and information processing.

G. Goranov's personal contribution to the educational activity is also serious and successful. In general, all the necessary requirements and indicators have been exceeded, taking into account Art. 54 and Art. 57 of the Regulations for Acquisition of Academic Degrees and Occupation of Academic Positions at TU-Gabrovo.

5. Critical notes and recommendations

I have a few minor criticisms of the submissions that do not completely discount the applicant's contributions:

- Spelling errors and stylistic inaccuracies are noticeable in the publications and in the documents submitted for the competition.

6. Personal impressions

I know Ch. Assistant Professor G. Goranov as an erudite lecturer, ethics colleague, proven researcher with great potential to create and develop constructive ideas in education and research.

7. Conclusion:

In view of the foregoing, I recommend Ch. Assistant Professor Goran Danailov Goranov to be accepted for "Associate Professor" in the higher education area 5. Technical Sciences, professional field 5.2 Electrical Engineering, Electronics and Automation, specialty "Elements and Devices of Automation and Computing (Impulse and digital devices, Digital Circuits)".

11/28/2019   Jury Member: /signature/
                                                        / Prof. Anna Stoynova, Ph.D. /