REVIEW

By Prof. Dr. Rumen Trifonov, Technical University - Sofia,

Of the materials presented for participation in the competition for the academic position of

"Professor" at the University "Prof. Dr. Asen Zlatarov" – Burgas

Field of higher education - 5. Technical sciences,

Professional field - 5.3 Communication and computer engineering, Scientific specialty - 02.21.04 – Computer systems. Complexes and networks (system programming)

In the competition for the position of "Professor" announced in Stet gazette, issue.5 from 17.02.2020 and in the webpage of University "Prof. Dr. Asen Zlatarov" – Burgas on the Internet for the Department of "Computer systems and technologies of the Faculty of technical sciences, a candidate taking part is Assoc, Prof. Dr. Stanislav Denchev Simeonov.

1. Grounds

The present review is elaborated and presented on the grounds of Order RD – 109 from 01.06.2020 of the Rector of the University "Prof. Dr. Asen Zlatarov" – Burgas.

2. Short biographical data

Assoc. Prof. Dr. Stanislav Denchev Simeonov was born in 1963 in Sofia. He completed his university studies in Technical University of Chemnitz, Germany, in 1988. In 1994, he was awarded the scientific degree of PhD at the same university. He has been associate professor since 2001, and since 2011 has been member of the Department of CST at the University "Prof. Dr. Asen Zlatarov" – Burgas. He has been elected as Chief of Department and Deputy Dean of the Scientific research branch of the Burgas free university and University "Prof.Dr.Asen Zlatarov" – Burgas.

3. General description General description of the presented scientific results

The candidate Associate Professor Stanislav Simeonov, PhD participates in the competition with 62 outside of the ones, presented in earlier procedures:

- Monographs – 1 piece;
- Scientific Publications - 58 pieces;
- Handbook - 1 piece;
- Patents – 1 piece;
- Patent Applications – 1 piece.

The publications can be classified as follows:

- Publications in journals, referenced and indexed in worldwide databases – Scopus – 21 pieces;
- Publications in referenced journals – 49 pieces;
- Scientific publications in international conferences abroad – 9 pieces;
- Independent publications – 5 pieces;
- Publications in Bulgarian – 4 pieces.

The total impact factor is 19.703. It is observed from the presented references, that the main indicators, according to Unified National Requirements, compliant with the Statute for

holding academic position in "Prof. Dr. Asen Zlatarov" University, Annex No.1, defining the requirements for AP "Professor" for field 5 "Technical sciences" are met.

4. Review of the contents and results from the presented

The presented scientific results can be classified into the following groups:

- Operating Systems – real time, system programming, computer networks (№ 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23);
- Modeling of linear and non-linear processes. Neural and Generalized Networks (№ 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35);
- Computer interfaces and specialized interfaces for the visually impaired (№ 36, 37, 38, 39, 40, 41, 41, 43, 44, 45, 46, 47, 48, 49, 50);
- Mobile robotics and computer-controlled (№ 54, 55, 56, 57, 58, 59, 60);
- Digitalization of cultural heritage (№ 61, 62).

These contributions can be defined and classified in the following way:

I. Scientific

- A classification is made for objects to be controlled in real-time mode. Based on that classification, a concept of modular objects for real-time control is shown, thus creating conditions for study and virtualization of real-time type operating systems. [1]. Studies are carried on real-time type operating systems. The results of the study are published in [1], [8], [9], [10][11];
- Development of theoretical models for planning of multitasking in real time, as well as the recalculation of the conditions for keeping the criteria in real time [8], [9], [10], [11]. A theoretical model and development of distributors, based on fast timers is presented. Parameterization of distributors in real-time type operating systems are modelled [10], [11], [12], [13], [17].
- Mathematical modelling of neural networks with the help of impulse differential equations [24, 25]. Peaks in functional description are studied, which gives the opportunity for ascertaining the sustainability of the systems and their control. The dynamics of systems, described with neural networks is studied [25, 28, 29, 30]. The extreme values, obtained in the functional description, as well as the effects of impulses, in certain conditions can be the cause of oscillations in the system and can additionally lead to divergences in the conditions and to instability;
- Targeted impulse interference in the dynamics of the systems and on their basis their capability to control using impulses. [25, 29, 30]. Studies and calculations of sets of criteria for exponential stability are made using the continuous function of Lyapunov [25, 26, 28, 30];

II. Applied Science

- The productivity of file systems on the basis of unified criteria is studied, in view of their application as an element of the real-time type systems [13], [14]. A concept for realization of linear structures and stacks in kernel mode of the operating system for recognition and processing of attacks in computer networks is shown [4], [5], [16], [19], [20];
- Formation of criteria and development of filters in kernel mode, for detection and prevention of attacks in high performance computer networks [16], [19], [20];
- Development of a model for creating a virtual driver, with application in high-intensity communications in computer clusters and parallel systems. The problem is related to the avoidance unnecessary delays in exporting and importing large

amounts of memory, in high-intensity calculations. Implementation of a lightweight hardware - software mechanism – Door Bell [22], [23].

- Study of the software interface of open source systems [36], [37], [38], [40], [49]. The studies are related to the implementation of a control system for computer interfaces for the visually impaired. On this basis, a general structure of a specialized computer interface for the visually impaired is presented [36]. In view of the specifics of visually impaired people working with a computer, a general structure for a combined computer interface is shown, supporting the interactive communication with a computer.;
- Voice communication model in a specialized interface for the visually impaired [42], [43], [44], [45]. Voice communication is an auxiliary feedback channel for the visually impaired person, in the direction of the computer. A model for giving commands has been refined and a protocol for giving commands to a computer has been developed;
- Digitization of original texts from archival documents, their storage in specialized databases and systematization of their search. A system for digital storage of three-dimensional images of statues and additional sculptural components, their classification and possibilities for reproduction and assembly of originals has been implemented. [60];
- Designing network models and creating distributed databases connecting private collections and visualization capabilities [60];
- Application of ontological engineering for the needs of the digital collections of the Bulgarian museums. A skeleton model and data applicable to the movable cultural heritage have been designed. Top-Down analysis is applied and semantic descriptions are prepared [62].

III. Applied

- Development and implementation of an independent system interface, with universal application in information systems [21];
- The use of solenoids creates an opportunity for realization and a program model of an interface for the visually impaired [39], [41], [51], [52] .
- A combined structure of solenoids with magnets and magnetic spheres rotating under the influence of magnetic fields is presented. This allows for impulse control of tactile matrixes with dimensions larger than 16x16;
- Registered patent: Karastoyanov D., Simeonov S., Braille display, Patent of the Republic of Bulgaria № 66527 / 28.04.2016;
- • Patent application registered: Karastoyanov D., Simeonov S., Dimitrov A., Braille display, Patent application of the Republic of Bulgaria, reg. № 110795, priority from 11.11.2010.

Assoc. Prof. Eng. Stanislav Simeonov, PhD is an experienced teacher. He has taught at the Burgas Free University and the "Prof. Dr. Asen Zlatarov" University – Burgas. He has given lectures on basic and profiling disciplines: Computer Architectures, Operating Systems, Computer Communications, Communication Technology, Signals and Systems, UNIX / Linux Wireless Networks, Network Administration. He is a certified instructor of the CISCO Academy Program.

He has led lecture courses to graduates at the Technical University - Sofia, Technical University - Gabrovo, Shumen University and others.

He has lectured on the Erasmus program and other programs at technical universities in Germany, Turkey, Malaysia, and the United States.

He has been tutor of three successfully defended doctoral students.

5. Reflection of the scientific publications of the candidate in the scientific community (known citations)

The candidate submitted a list of known citations. The list contains 59 citations, of which 35 are in international databases SCOPUS and Web of Science. It is evident that the scientific results of the candidate are cited by authors working in similar research areas.

The candidate has also submitted a list of contracts and won competition projects with his participation nationally and internationally. He is the leader in the major part of the projects. He works successfully not only with partners from the country (TU Sofia, Sofia University, IICT BAS, Port Infrastructure, but also with partners from abroad (TU Chemnitz, Germany, Technical University of Munich, Germany, Technical University of Prague, Czech Republic, and others.).

6. Critical remarks

I have no critical remarks. I can advise the candidate to concentrate his scientific activity on preparation for the next academic degree

7. Conclusion

The candidate Assoc. Prof. Stanislav Simeonov significantly exceeds all the requirements of the Law on the Protection of the Rights of Persons with Disabilities and the Rules of Procedure of the University "Prof. Dr. Asen Zlatarov "- Burgas on the terms and conditions for holding the academic position of" professor ". There is a sufficient volume of scientific production with scientific, scientific-applied and applied contributions. The practical and patent realization of the obtained results of scientific researches is impressive.

Having in mind the above, I propose Assoc. Prof. Dr. Eng. Stanislav Denchev Simeonov to take the academic position of "Professor" in Professional Field - 5.3 Communication and Computer Engineering, Scientific Specialty - 02.21.04 - Computer Systems, Complexes and Networks (System Programming).

18.08.2020
Sofia

Signature:
/Prof. Rumen Trifonov/