S T A N D P O I N T

Regarding: Competition for occupation the academic position Professor,
in the professional field 5.3 Communication and Computer Engineering, subject
Administration of local and Internet networks,
department Computer Science and Technology

Announced: in State gazette, issue 29 from 31.03.2023 г.
Candidate: **Associate Professor Eng. Hristo Georgiev Valchanov, PhD**
Member of the scientific jury: **Professor Eng. Teodor Bozhidarov Iliev, PhD,**

In this competition for occupation the academic position Professor, appointed in the Bulgarian State Gazette issue 29/31.03.2023 and on the official website of Technical university - Varna, the only candidate for this position is Assoc. Prof. Eng. Hristo Georgiev Valchanov, PhD.

1. General characteristics of the research and scientific-applied activity of the candidate

Assoc. Prof. Eng. Hristo Georgiev Valchanov, PhD was graduated from Technical University – Varna with M.Sc "Computing equipment" in 1989. In 2008 he defended successfully a dissertation for obtaining the educational and scientific degree PhD on the topic „An integrated approach for object-oriented distributed simulation". From 1990 he worked at the Technical University - Varna consecutively as an assistant (department Computing equipment), chief assistant and associate professor (department of Computer Science and Technology). Assoc. Prof. Hristo Valchanov's research, engineering and pedagogical activities are developed in a balanced and simultaneous way, complementing each other.

Assoc. Prof. Hristo Valchanov, PhD participated in the competition with 70 scientific papers according to the groups of indicators (В.4, Г.7 and Г.8).

The publications can be classified, as follows: 1) Referenced and indexed in world-renowned database (Scopus and/or Web of Science) – **36** papers [publication from group В.4 (14 papers) and from group Г.7 (22 papers); 2) manuscripts published in international journals, indexed in Scopus with SJR - **6** papers [В4.9, В4.10, В4.13, Г7.10, Г7.12, Г7.17 of the attached list of publications]; 3) manuscripts published in international journals - **2** papers [Г8.5, Г8.12 of the attached list of publications]; 4) manuscripts, published in Bulgarian journals - **9** papers [Г8.10, Г8.15, Г8.20, Г8.21, Г8.24, Г8.29, Г8.32, Г8.33, Г8.34 of the attached list of publications]; 5) papers in conference proceedings indexed in Scopus - **30** papers [В4.1÷В4.8, В4.11, В4.12, В4.14, Г7.1÷Г7.9, Г7.11, Г7.13÷Г7.16, Г7.18÷Г7.22 of the attached list of publications]; 5) papers in conference proceedings from conferences in Bulgaria - **23** paper [Г8.1÷Г8.4, Г8.6÷Г8.9, Г8.11, Г8.13, Г7.14, Г8.16÷Г8.19, Г7.22, Г7.23, Г8.25÷Г8.29, Г8.30, Г8.31 of the attached list of publications.

The contents of the above scientific papers are fully relevant to the scientific field of the competition for academic position "Professor".

Assoc. Prof. Valchanov took part in: 1) 19 national scientific and educational projects, one of which was a coordinator; 2) 3 international scientific and educational projects.

2. Evaluation of the applicant's teaching activity

Assoc. Prof. Hristo Valchanov, PhD has considerable teaching experience. Over the last 3 academic years he has taught the following subjects: Operating Systems, Local and Internet Network Administration, Principles of Operating Systems, Internet Information Retrieval, Computer and Network Security, Virtualization Technologies, Network Infrastructures, Distributed and Network OS, Internet Servers and Technologies, Distributed Programming for the Bachelor's and Master's degrees in the professional field 5.3 Communication and Computer Engineering.

He has been diploma work supervisor to more than 70 students who defended successfully.

Undoubted proof of Assoc. Prof. Valchanov's work with students not only during regular academic hours, but also outside of them is the common scientific papers with the students.

3. Main scientific and applied contributions

From the analysis of the presented materials I can classify the main contributions of the candidate in the competition in the following main areas:

1. Research in the field of cloud services.

The following scientific papers can be referred to this area [В.4.1-В.4.14, Г.7.19, Г.8.1, Г.8.22-Г.8.26, Г.8.29, Г.8.32, Г.8.33] (24 papers) and the following contributions:

Scientific, scientifically applicable contributions:

- Smart contract based insurance models on private blockchain, public blockchain and combined solution have been proposed.
- A property insurance model based on smart contract on blockchain has been proposed.
- A smart contract-based life insurance model on a private blockchain has been proposed.
- An approach for the implementation of a cloud service for booking medical examinations has been proposed.
- An IoT and blockchain integration model for intelligent transportation have been proposed.
- An IoT and blockchain integration model for hospitalization tracking have been proposed.
- Models for implementation of vaccination based on a smart contract on a private blockchain are proposed.
- A smart contract-based model for higher education subsidy tracking on a private blockchain has been proposed.
- Algorithms and approaches are proposed for load balancing in SDN and finding the best path between hosts.

Applied contributions:

- The proposed models have been implemented through smart contracts on:
  -Public Blockchain – Ethereum.
  -Private Blockchain - Hyperledger Fabric.
- A web-based system for the sale of crypto-tokens for ICO (Initial Coin Offering) based on the Ethereum blockchain has been created.
- Web-based and cloud-based systems for booking medical examinations have been developed.

2. Research in the field of methods and approaches for increasing the quality of services (QoS) in modern wireless networks.

The following scientific papers can be referred to this area [Г.7.1÷Г.7.16, Г.7.20÷Г.7.22, Г.8.34] (20 papers) and the following contributions:

Scientific, scientifically applicable contributions:

- An algorithm is proposed for allocating resources in a LiFi network based on the prioritization of traffic classes.
- Algorithms and approaches have been proposed to improve QoS for LTE networks based on traffic prioritization in the scheduler.
- An algorithm for building an energy-balanced ZigBee network has been proposed.
- An algorithm for allocating resources in a 6loWPAN network based on traffic prioritization has been proposed.
- An algorithm for finding the best path in a LoRaWAN network has been proposed.
- Approaches to improve QoS for wireless sensor networks based on LiFi, ZigBee, 6loWPAN and BLE technologies have been proposed.

Applied contributions:

- Prototypes for LiFi communication have been developed.

- A prototype of an indoor LiFi network implementing horizontal handover has been implemented.
- A simulation environment has been developed for LTE, 6loWPAN, ZigBee, LoRaWAN and BLE networks, implementing proposed and known algorithms.
- An experimental network for implementing 6loWPAN, ZigBee and BLE technologies has been implemented.

3. Research in the field of security of the advanced computer networks.

The following scientific papers can be referred to this area [Г.8.5, Г.8.13÷Г.8.21, Г.8.27, Г.8.28, Г.8.30] (12 papers) and the following contributions:

Scientific, scientifically applicable contributions:

- A botnet attack detection approach based on genetic algorithms is proposed.
- An approach for testing vulnerabilities in wireless networks is proposed.

Applied contributions:

- A simulator of botnet DoS attacks has been developed.
- A botnet DoS attack generator has been developed.
- A botnet attack recognition system based on genetic algorithms has been developed.
- A hardware system for recognizing and protecting against attacks has been developed.
- A wireless data collection hardware system suitable for the war-driving technique has been developed.

4. Research in the field of computer systems and technologies.

The following scientific papers can be referred to this area [Г.7.17, Г.7.18, Г.8.2÷Г.8.4, Г.8.6÷Г.8.12, Г.8.15, Г.8.31] (14 papers) and the following contributions:

Scientific, scientifically applicable contributions:

- An approach for transferring multimedia traffic over low-speed global networks has been proposed.
- An approach for building hybrid multi-threaded libraries has been proposed.
- A method for activating a wearable device with a touch-sensitive bezel with 2 fingers has been proposed.
- A pose recognition method is proposed when activating a wearable device interface.

Applied contributions:

- A system has been developed for indexed search on a local network.
- Two prototypes of a smartwatch were created - with buttons and with a touch-sensitive bezel.
- A test environment was created to collect readings for enabling a touch interface on a 2-finger wearable device.
- A system for the analysis and diagnosis of digital images of blood samples has been developed.
- Hybrid multithreading library have been developed.
- An experimental virtual infrastructure has been implemented for training in disciplines related to computer networks.

I accept the contributions announced by Assoc. Prof. Hristo Valchanov, PhD. I define the contributions presented as: scientific, scientifically applicable and applied. I consider that the requirements for quantitative performance criteria for academic position "Professor" are met.

Assoc. Prof. Hristo Valchanov has submitted information for 72 citation in SCOPUS and/or Web of Science database, 61 from them of foreign authors. The reference to the citations shows that the scientific publications of Assoc. Prof. Hristo Valchanov are well known and accordingly evaluated by the scientific community in Bulgaria and abroad.

4. Significance of contributions to science and practice

The candidate's main scientific and applied contributions in the submitted publications under the competition can be classified according to the fulfillment of the scientometric criteria as follows:

Groups of indicators	Content	Minimum score points for academic position Professor	Fulfillment
А	Indicator 1	50	**50 pts.**
Б	Indicators 3 or 4	100	**330 pts.** (indicator 4)
Г	Sum of indicators from 5 to 9	200	**640,3 pts.** Indicator 7 – 269,5 pts. Indicator 8 – 370,8 pts.
Д	Sum of indicators from 12 to 14	100	**828 pts.** Indicator 12 – 720 pts. Indicator 13 – 108 pts.
Е	Sum of indicators from 16 to 26	150	**471,8 pts.** Indicator 18 – 190 pts. Indicator 19 – 60 pts. Indicator 20 – 20 pts. Indicator 22 – 1,7 pts. Indicator 24 – 200,1 pts.

The independent publications of Assoc. Prof. Hristo Valchanov, PhD and those where he has a lead role, are evidence of his leadership in the research. The scientific ideas and approaches presented and defended in scientific forums are an assessment of the candidate's personal contribution.

5. Critical remarks and recommendations

I have no critical remarks on the documents, scientific production and academic activity presented by the candidate. I will point out some recommendations on the future work of Assoc. Prof. Hristo Georgiev Valchanov, PhD:

- My recommendation to Assoc. Prof. Valchanov and his leading PhD students to publish their future scientific results in journals with impact factor, which would also help to increase the citation index.

6. Conclusion:

The presented documents and materials fully satisfy and exceeds the requirements of the Law for the Development of Academic Staff in the Republic of Bulgaria and the Regulations on its implementation as well as the Regulations for the conditions and order for acquiring academic degrees and academic positions at Technical University - Varna.

I hereby suggest with the utmost conviction of the Honorable Scientific Jury **to elect Associate Professor Hristo Georgiev Valchanov, Eng, PhD for the academic position „Professor"** in the field of higher education 5. Technical Sciences, professional field 5.3. Communication and Computer Engineering, subject Administration of local and Internet networks.

July 27, 2023

Member of the scientific ju