OPINION

Regarding the participation of **Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD**
in a competition for awarding the academic position of "Associate Professor"
in professional field 5.3. Communication and computer technology,
announced in SG, issue 45 of 28.05.2021
for the needs of department "Communication Systems and Services"
by member of the Scientific panel: **Assoc. Prof. Svetozar Ilchev, PhD**

1. Legal requirements

The Scientific panel of the present competition for awarding the academic position of "Associate Professor" is appointed by order no. 178-1 of 16.07.2021 of the Director of IICT-BAS according to Art. 4, para. 2 of the Act on Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and a decision of the Scientific council of IICT (minutes no. 6 of 23.06.2021). The competition is published in State Gazette, issue 45 of 28.05.2021, for the needs of IICT-BAS, department "Communication Systems and Services". The only candidate is **Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD.**

In my capacity as a member of the Scientific panel, I received a full set of documents meeting the requirements for awarding the academic position of "Associate Professor" according to the ADASRB, Art. 24 (1), the Regulations on the Implementation of the ADASRB (RIADASRB) and the Regulations of Specific Conditions for Attaining Scientific Degrees and for Holding Academic Positions at IICT-BAS. According to the documents, **Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD satisfies the requirements of Art. 24 (1), item 1** (defended PhD thesis on the topic of „Modeling and Simulation of rare events in the handover of wideband cellular radio networks", Diploma no. РУ-НС-2015-11 of 03.04.2015), **Art. 24 (1), item 2** (5 years, 11 months and 7 days of work experience as chief assistant, service certificate no. 10-348#1 of 24.06.2021), **Art. 24 (1), item 3** (min. 10 publications in specialized scientific journals and proceedings referenced and indexed in Scopus or Web of Science) and **Art. 24 (1), item 5** (no legally proven plagiarism according to the submitted declaration).

Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD satisfies the requirement of Art. 24 (1), item 4, as according to the submitted documents, she **meets the minimum national requirements under Art. 2b, para. 2 and 3**, respectively the **requirements under Art. 2b, para. 5, as well as the requirements in the Regulations of Specific Conditions** for Attaining Scientific Degrees and for Holding Academic Positions **at IICT-BAS**, according to which the candidates for the academic position of "Associate Professor" in professional field 5.3 Communication and computer technology must have the following minimum scientometric indicators:

- indicator group A – 50 points;
- indicator group B – 100 points and minimum 10 publications in journals and proceedings referenced and indexed in Scopus or WoS;
- indicator group C – 220 points;
- indicator group D – 60 points;
- indicator group E – 20 points.

The list of scientific publications for participation in the competition prepared by Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD includes the following scientific works:

- **12 scientific publications with SCImago Journal Rank (SJR)** or publications in journals and proceedings of scientific conferences **indexed in Scopus or Web of Science** (no. 1-12);
- **21 scientific publications** in journals and proceedings of scientific conferences **without referencing and indexing in Scopus or Web of Science** (no. 13-33);
- **1 educational textbook-guide** (no. 34).

All publications are in the field of the competition. 31 scientific works are co-authored, 3 scientific works are without co-authors (no. 25, 29, 32) and Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD is the first or only author of 12 of the presented scientific works.

Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD has presented a list of a total of **22 observed citations, 16 of which are in scientific publications referenced and indexed by Scopus or Web of Science**.

According to the presented reference to the fulfillment of the minimum requirements of IICT for Associate Professor, Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD has participated in **a total of 10 national scientific or educational projects**.

The submitted documents substantiate the number of points calculated for the candidate, which are distributed among the indicator groups as follows:

- indicator group A – **50 points** (defended PhD thesis);
- indicator group B – **151 points and 10 publications** in journals and proceedings **referenced and indexed in Scopus or Web of Science;**
- indicator group C – **227 points**;
- indicator group D – **172 points**;
- indicator group E – **110 points**.

In conclusion, Chief Assistant Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD has the necessary points in all indicator groups and, in groups B, D and E, the calculated points exceed significantly the required minimum number of points.

According to **Art. 26 (1) of the ADASRB**, Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD has presented a detailed report on her original scientific, scientifically applied and applied contributions.

2. Short biographical information

Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD graduated from the **Technical University - Sofia in 1992, majoring in radio and television engineering**. She did a **professional pedagogical specialization in VPI "Neofit Rilski", Blagoevgrad** in the period 1993 - 1994. In the period March 2012 to March 2015 she obtained **the educational and scientific degree of "Doctor" in professional field 5.3 Communication and computer equipment from "Angel Kanchev" University of Ruse**. Her work experience is related to **teaching and research in various educational institutions**, including the Higher School of Telecommunications and Post, Sofia and PG "K. Fotinov", Samokov. She also has experience with **administrative management activities as acting Director** of the municipal children's complex, Samokov.

3. Original scientific and scientifically applied contributions

The important contributions of Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD are in the following fields: sensor computer systems, computer methods for simulation, remote data exchange and protection of computer and communication networks and systems. The contributions can be summarized as follows:

1. An approach for laser projection on a two-dimensional surface has been designed along with a laser projection system for industrial applications.

2. A UML-based approach has been developed in the field of human-machine interface for computer control via a Kinect sensor.

3. An advanced algorithm for simulation research of the probabilities for occurrence of rare events and estimation of QoS parameters in IPv6 based network architectures has been developed. A simulation platform has been proposed for the evaluation of the efficiency of signal transmission in various traffic models of fifth generation networks. An assessment of the influence of input parameters on the probabilities of errors has been made. The basic requirements for fifth generation networks are justified. An evaluation of the probabilistic parameters of the quality of service while studying rare events has been made.

4. An approach for selecting the type of the wireless network is proposed, based on a comparative analysis of IEEE 802.11, 802.16 and 802 standards. Methods for mobility management in 5G, 6G and Next Generation Wireless Networks are proposed. Handover-type selection schemes are proposed.

5. A software platform for simulation has been developed and applied in the process of educating students at the University of Ruse and the College of Telecommunications and Post, Sofia with the goal of accessibility and experimental visualization of the educational content.

6. A trigonometric polynomial of the fourth degree is derived, which approximates functions with high accuracy. An estimate of the approximation error during the synthesis of one-dimensional digital filters is made and simulation dependences are derived.

7. A concept has been developed for the remote exchange of data for recording the health status of patients for the purposes of consultations, monitoring of physiological indicators of the body, for distance learning, training and management of the medical care system. A method for diagnostic assessment of the condition of the cardiovascular system (CVS) based on the remote recording of a pulse line is proposed. The proposed method for remote monitoring of the condition of the cardiovascular system is relevant for patients recovering from COVID-19.

8. A communication strategy for distance learning has been developed at the College of Telecommunications and Post, based on the Moodle platform. Basic functionalities of the distance exchange used for e-learning and distance learning have been developed. Specific methodological aspects of the communication strategy are described.

9. The results of distance learning conducted during laboratory exercises on power supply systems with students from the TU are presented and analyzed. The problems with the assimilation of the study material and the operation of the devices used during the remote laboratory exercises are analyzed.

10. A method for protecting web-based applications from hacker attacks and vulnerabilities based on the ModSecurity module has been proposed. Real techniques for protection against different types of attacks are described - HTTP, DoS, DDoS and SQL injections.

11. Studies of the security of data transmitted in computer and industrial networks have been conducted. The possible types of attacks and the mechanism for making the most effective decision in the design and operation of ZigBee networks are studied. An approach for security enhancement has been proposed.

12. An architectural model of a communication network management system is described, in which the nodes consist of an object and a management application. The connection is based on SNMP. An integrated approach and policies for effective protection are proposed.

4. Critical remarks and recommendations

After familiarizing myself with the documents presented by the candidate, I would like to make the following recommendations:

- A larger number of publications without co-authors and publications in journals with impact factor (IF);
- A clearer subdivision of the original contributions into scientific and scientifically applied contributions.

CONCLUSION

With regard to the current competition for awarding the academic position of "Associate Professor", **Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD satisfies all requirements of the ADASRB, the RIADASRB and the Regulations of Specific Conditions for Attaining Scientific Degrees and for Holding Academic Positions at IICT-BAS**. The calculated **scientometric indicators** and the presented **contributions exceed convincingly** the necessary thresholds for awarding the academic position of "Associate Professor".

I give my **unconditional positive recommendation** for the candidate and I propose that the members of the Scientific panel **vote unanimously** for a proposal to the Scientific council of IICT-BAS **for awarding the academic position of "Associate Professor"** in professional field 5.3. Communication and computer technology **to Chief Assistant Ekaterina Angelova Otsetova-Dudin, PhD.**

Sofia,   Member of the scientific panel: ....

September 02, 2021   (Assoc. Prof. Svetozar Ilchev, PhD)

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