

## OPINION

**Subject:** Participation of **Chief Assistant Svetozar Valeriev Ilchev, 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 68 of 31.07.2020 for the needs of department “Communication Systems and Services”

by member of the Scientific panel: **Prof. DSc Plamenka Ivanova Borovska, PhD**

### 1. Compliance with legal requirements

The current opinion is prepared in my capacity as a member of the Scientific panel of a competition for awarding the academic position of “Associate Professor”, appointed by order no. 185 of 02.10.2020 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. 9 of 30.09.2020). The competition was published in State Gazette, issue 68 of 31.07.2020, for the needs of IICT-BAS, department “Communication Systems and Services”. The only candidate is Chief Assistant Svetozar Valeriev Ilchev, PhD.

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 submitted documents, Chief Assistant Svetozar Valeriev Ilchev, PhD **satisfies the requirements of Art. 24 (1), item 1** (Diploma no. 000420 of 26.05.2014), **Art. 24 (1), item 2** (service certificate no. 757 of 08.09.2020), **Art. 24 (1), item 3** (12 publications in specialized scientific journals and proceedings referenced and indexed in Scopus or Web of Science) and **Art. 24 (1), item 5** (declaration by the candidate).

Chief Assistant Svetozar Valeriev Ilchev, PhD **satisfies the requirement of Art. 24 (1), item 4**, as according to the submitted documents, he 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 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 Svetozar Valeriev Ilchev, PhD contains a total of **25 scientific works, 1 patent and 3 utility models** registered by the Patent Office of the Republic of Bulgaria. The scientific works include **12 scientific publications with SCImago Journal Rank (SJR)** [1, 2, 3, 5, 6, 7, 12, 13, 15, 19, 22, 23], **3 scientific publications in journals and proceedings of scientific conferences indexed in Scopus or Web of Science** [4, 14, 24], **8 scientific publications in journals and proceedings of scientific conferences without referencing and indexing in Scopus or Web of Science** [8, 9, 10, 11, 16, 17, 18, 25], **1 monograph** [20] and **1 book** [21], both published by “Prof. Marin Drinov” Academic Publishing House, Sofia. All publications are in the field of the competition. 24 scientific works are co-authored, 1 scientific works is without co-authors [21] and Chief Assistant Svetozar Valeriev Ilchev, PhD is the first or only author of 15 of the presented scientific works.

The candidate has prepared a list of a total of **18 observed citations, 14 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 Svetozar Valeriev Ilchev, PhD has participated in **2 international scientific or educational projects and 2 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 B – **235.5 points and 12 publications** in journals and proceedings referenced and indexed in Scopus or WoS;
- indicator group C – **270.8 points**;
- indicator group D – **148 points**;
- indicator group E – **220 points.**

In conclusion, Chief Assistant Svetozar Valeriev Ilchev, PhD has the necessary points in all indicator groups and, in groups B, D and E, the calculated points significantly exceed the required minimum number of points.

## **2. Brief biographical information about the candidate**

Chief Assistant Svetozar Valeriev Ilchev, PhD obtained his bachelor's degree from the Technical University of Sofia in 2007 and his master's degree from the Technical University of Karlsruhe, Germany in 2009. In the period 2007-2009, he was a scholarship holder of the German Academic Exchange Service (DAAD). **In 2014, he received the educational and scientific degree of “Doctor” from IICT-BAS.** His work experience includes the employers Grammer AG, Trudovets, SAP Labs, Sofia, IBM Development Laboratory, Boeblingen, Germany, Center for Innovation and Entrepreneurship at Karlsruhe Institute of Technology and Karlsruhe Institute of Technology, Germany. **Since 2014, he is Chief Assistant at IICT-BAS.** He has fluent command of English and German.

### 3. Original scientific and scientifically applied contributions

Chief Assistant Svetozar Valeriev Ilchev, PhD has presented a detailed report on the original scientific and scientifically applied contributions described in the scientific works, patent and utility models submitted for the competition. The contributions fall into one of the following main categories: Internet of Things (IoT) in the industry, Steganography and digital watermarking, and Neural networks.

#### 3.1. Scientific contributions

The scientific contributions of Chief Assistant Svetozar Valeriev Ilchev, PhD can be systematized as follows:

- A new **concept for communication** between wired and wireless microcontrollers [12] has been developed along with a **strategy for packet routing** in IoT networks, an original **unified protocol for communication** in the field of Internet of Things and a new **approach to the conceptual modeling of IoT ecosystems** [11].
- A new **method for the prediction of climatic parameters** (temperature, humidity, level of the atmospheric pressure in urban regions) is proposed, which is based on a combination of an extended Kalman filter and an algorithm for “extreme machine learning” [2].
- A **model of low-power wireless sensor networks** has been developed and studied to estimate the energy consumption of wireless sensor nodes [3].
- An **innovative technology for steganography and digital watermarking** [15-17] and [19-22] has been developed, which includes the **concept of creating modular methods** for data hiding. Based on the concept, **four sample methods** for steganography and digital watermarking have been developed.
- A new **approach to steganalysis** based on correlation has been developed. As a result, **four methods for steganalysis** of JPEG images have been created [19].
- An **information model of a biological neuron** has been developed, which includes three main characteristics of the cell, which directly determine the way, in which information is processed in its body [14].
- A **classification method based on two hypersurfaces** – one inner and one outer hypersurface – has been developed. A new classification rule is defined by means of the hypersurfaces [23].
- An original **method for pre-processing and classification of objects** by using a neural network and a partially invariant description of the object based on the radial profile of its contour has been developed [24, 25].

#### 3.2. Scientifically applied contributions

The scientifically applied contributions of Chief Assistant Svetozar Valeriev Ilchev, PhD can be systematized as follows:

- A new **IoT communication platform** called HybridNET has been developed [10-13]. **Two types of electronic controllers** have been designed. They are protected by registered utility models [28, 29] and use their own original **communication protocol**.

- An original **mobile system for remote monitoring of the environment** has been developed. It is protected by a valid patent [26].
- Several types of original **drivers for the control and cooling of laser diodes** [1, 4, 5, 9, 27] have been developed, as well as a **compact laser system** for the projection of laser animations [6] that includes a new hardware controller with proprietary firmware.
- New **applications and services for digital watermarking and steganalysis** have been developed, which are integrated with the software of public web portals on the Internet [15].

#### 4. Critical remarks and recommendations

With regard to the submitted documents, the following recommendations can be made:

- A larger number of publications without co-authors and publications in journals with impact factor (IF);
- A clearer division 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 Svetozar Valeriev Ilchev, 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 submitted contributions **exceed convincingly** the necessary thresholds for awarding the academic position of “Associate Professor”.

I give my **unconditional positive conclusion** for choosing Chief Assistant Svetozar Valeriev Ilchev, PhD in the competition for awarding the academic position of “Associate Professor” in professional field 5.3. Communication and computer technology.

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 Svetozar Valeriev Ilchev, PhD**.

Sofia,  
October 30, 2020

Member of the Scientific panel:



( Prof. Plamenka Ivanova Borovska, PhD )