

REVIEW

by acad. Vassil Stoyanov Sgurev

regarding a competition for holding the academic position of “Associate Professor”,
in professional field 5.3. “Communication and computer technology”,
scientific field 5. “Technical sciences”,
announced in SG, issue 68 of 31.07.2020,
for the needs of department “Communication systems and services” of
the Institute of Information and Communication Technologies at the
Bulgarian Academy of Sciences

with a single participant – Chief Assist. Svetozar Valeriev Ilchev, PhD

The current review is prepared pursuant to order no. 185 of 02.10.2020 of the Director of the Institute of Information and Communication Technologies - BAS, Prof. Galia Angelova, D.Sc. At the first meeting of the Scientific jury, minutes no. 1 of 06.10.2020, I was appointed as a reviewer of the competition for holding the academic position of “Associate Professor” in professional field 5.3. “Communication and computer technology”, scientific field 5. “Technical sciences”, announced in SG, issue 68 of 31.07.2020, for the needs of department “Communication systems and services” of the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences.

As a member of the Scientific jury, I have received:

1. Order no. 185 of 02.10.2020 of the Director of the Institute of Information and Communication Technologies - BAS, Prof. Galia Angelova, D.Sc.
2. Europass curriculum vitae of the candidate.
3. Copy of the diploma for the educational and scientific degree of “Doctor” of the candidate.
4. Certificate of service of the candidate.
5. List of scientific publications of the candidate for participation in the competition.
6. List of inventions and other scientifically applied results of the candidate.
7. List of citations of the candidate.
8. Abstracts of the scientific publications of the candidate for participation in the competition.

9. Copies of the scientific publications of the candidate for participation in the competition.
10. Information on the fulfillment of the minimum requirements of IICT by the candidate.
11. Reference to the original scientific and scientifically applied contributions of the candidate.
12. Declaration that there is no plagiarism proven as per the legally established order in the scientific works of the candidate.

According to the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria (ADASRB) and the regulations on its implementation (RI), the candidates for holding the academic position of "Associate Professor" must meet the following conditions laid down in Art. 24. (1):

1. (suppl. - SG 30/18, in force from 04.05.2018) to have been awarded the educational and scientific degree of Doctor;
2. for minimum two years to have occupied the academic position of Assistant, Chief Assistant;
3. to have presented a published monograph or equivalent publications in specialized scientific issues, which do not reproduce those presented for awarding the educational and scientific degree of Doctor and for awarding of the scientific degree of Doctor of Science.
4. (new - SG 30/18, in force from 04.05.2018) to meet the minimum national requirements under Art. 2b, Para. 2 and 3, respectively the requirements under Art. 2b, Para. 5;
5. (new - SG 30/18, in force from 04.05.2018) to have no plagiarism proven as per the legally established order in the scientific works.

According to the submitted documents for participation in the competition, **Chief Assist. Svetozar Valeriev Ilchev, PhD** meets the requirements of **Art. 24. (1), item 1** (Diploma no. 000420 of 26.05.2014) and satisfies the requirements of **Art. 24. (1), item 2** (certificate of service no. 757 of 08.09.2020).

According to the presented list of scientific publications, **Chief Assist. Svetozar Valeriev Ilchev, PhD** participates in the competition with twenty-five publications. Of these, twelve have **SCImago Journal Rank** [1, 2, 3, 5, 6, 7, 12, 13, 15, 19, 22, 23], eleven are in journals and proceedings of scientific conferences without **SJR** [4, 8, 9, 10, 11, 14, 16, 17, 18, 24, 25], one monograph [20] and one book [21].

The presented publications have not been used in the procedures for holding the educational and scientific degree of “Doctor” and the academic position of “Chief Assistant”, which satisfies the requirements of **Art. 24. (1), item 3**. All publications are in the field of the competition.

The reference to the contributions in the works, with which **Chief Assist. Svetozar Valeriev Ilchev, PhD** participates in the competition, is compiled correctly and the results have scientific, scientifically applied and applied character.

The list of citations presented by **Chief Assist. Svetozar Valeriev Ilchev, PhD** shows a total count of 18 citations. This count is up to the moment of submission of the documents for the competition and it does not include any newly published citations.

From the list of patents and utility models presented by **Chief Assist. Svetozar Valeriev Ilchev, PhD** follows that he is a co-author of one patent (no. 66700 / 28.06.2018) and three utility models (no. 2909 / 30.03.2018, no. 2832 / 30.11.2017, no. 2807 / 31.10.2017).

Chief Assist. Svetozar Valeriev Ilchev, PhD has participated as part of a team in two national and two international research and applied projects.

According to the presented information, **Chief Assist. Svetozar Valeriev Ilchev, PhD** satisfies the requirement of **Art. 24. (1), item 4**, and meets the minimum national requirements under **Art. 2b, para. 2 and para. 3**, respectively the requirements under **Art. 2b, para. 5**, as well as the Specific requirements of the Institute of Information and Communication Technologies at the Bulgarian Academy of Sciences for holding academic positions.

The works presented by **Chief Assist. Svetozar Valeriev Ilchev, PhD** in the competition are original and there is no known information about plagiarism, which is a requirement of **Art. 24. (1), item 5**.

The scientific and scientifically applied contributions of the candidate in the competition can be generally summarized as follows:

I. Internet of Things (IoT):

- Connection for device management and sensor data collection in the environment. A connection between the controllers of this platform and the INTERNET is proposed, as well as packet routing in IoT-networks and electronic controllers for the Hybrid NET platform;

Based on these results, two utility models have been registered: an industrial electronic controller with extensible peripherals and a waterproof electronic controller of temperature and humidity;

- A method for predicting climatic parameters has been developed by combining a Kalman filter with a machine learning algorithm. A mobile system for remote monitoring of the environment has been proposed and a corresponding patent has been registered;
- A method for modeling IoT ecosystems has been created;
- An experimental model for an intelligent laparoscopic instrument has been proposed;
- Research and modeling of sensor networks has been carried out. A set of instruments and a test environment have been developed for this purpose. A model of a wireless sensor network has been proposed, as well as a method for modeling and simulation of the parallel integration of sensor data;
- A compact energy-saving three-channel driver for various purposes has been proposed and a number of original results have been obtained about its operation.

II. Steganography and digital watermarking:

- Results of digital watermarking and steganographic analysis have been obtained, which have been integrated with the software of public web portals on the INTERNET;
- A technology for steganography and digital watermarking for the storage and transmission of multimedia file data on the INTERNET has been proposed. On this basis, a desktop-based product has been created, as well as a number of other applications.

III. Neural Networks

- An information model of a biological neuron has been proposed;
- A method for pre-processing and classification of objects by means of neural networks has been developed;
- A method for pre-processing images of single objects through neural networks has been created.

With regard to the reviewed works in this competition, the following general **remarks and recommendations** can be made:

- The author has obtained meaningful results, but no tendency to formalize them in the form of mathematical models is observed. This would help other researchers to better understand and use his achievements;
- It is advisable for the author to also aim for independent publications in the future;
- If the author narrows the scope of his research activity, even more in-depth results could be expected.

Conclusions

I know the candidate in the competition from the scientific seminars and conferences of IICT-BAS, where he proved to be a very well prepared researcher in the field of information and communication technologies. He is a young and promising researcher in a modern field of science and practice. In the works submitted by him for the competition, the requirements of the Act on Development of the Academic Staff in the Republic of Bulgaria (ADASRB), the Regulations on its implementation, the Regulations of BAS on the implementation of the ADASRB, as well as the Regulations of the Institute of Information and Communication Technologies on the implementation of ADASRB are fully satisfied.

All this gives me reason to give an unconditional **positive conclusion** for the choice of **Chief Assist. Svetozar Valeriev Ilchev, PhD** in the competition for the academic position of “Associate Professor” in scientific field 5. “Technical sciences”, professional field 5.3. “Communication and computer technology”.

I propose that the Scientific jury vote unanimously for a proposal to the Scientific Council of the Institute of Information and Communication Technologies - Bulgarian Academy of Sciences, to elect **Chief Assist. Svetozar Valeriev Ilchev, PhD** for the academic position of “**Associate Professor**” in scientific field 5. “Technical sciences”, professional field 5.3. “Communication and computer technology”.

30.10.2020,
Sofia

REVIEWER



/Acad. Vassil Sgurev/