

OPINION

from Professor D.Sc. Daniela Borissova – Institute of Information and Communication Technologies (IICT) at the Bulgarian Academy of Sciences

on competition for academic position “**Associate Professor**” in professional field 4.6 “Informatics and Computer Sciences”, specialty 01.01.12 “Informatics”, announced for the needs of IICT-BAS, Department “Hierarchical Systems”, published in press No 41/21.05.2019 with sole candidate **Assistant Dr. Boriana Emilova Vatchova**

1. General description of the presented materials

According to Order No 180/19.07.2019 of the Director of IICT-BAS I was appointed a member of the Scientific Jury, and at the first meeting held on 26.07.2019 I received the materials in connection with the competition on electronic media.

The evaluation of the candidates for the occupation of the academic position “**Associate Professor**” shall be carried out in accordance to Art. 57a of the Rules for Implementation of the Law on the Development of Academic Staff in the Republic of Bulgaria (RILDASRB), and in accordance with Art. 53 and the results of the inquiries under Art. 54(1) also from the RILDASRB. In connection with the implementation of Art. 53 and on the basis of the presented documents, it was established the presence of:

- copy of the diploma No 33111 of 22.04.2009 for educational and scientific degree "doctor" in implementation of art. 53(1);
- a certificate of work experience in the specialty, in accordance to the Art. 53(2a);
- a reference for teaching activity in the discipline "Software Engineering" for masters at UTP-Sofia (University of Telecommunications and Post), which satisfies the requirement of art. 53(2b);
- published monograph in accordance with Art. 53(3);
- a reference for fulfill the minimum requirements of the IICT, where it can be seen that the relevant minimum national requirements and the requirements of art. 1a(2), which satisfies the requirement of Art. 53(4);
- a declaration for lack of plagiarism proven in the law, in the scientific works, in accordance to the Art. 53(5).

For the implementation of Art. 54(1), the applicant has presented a certificate for the fulfillment of the minimum national requirements, a report on the requirements of art. 1a, para. 2, as well as a reference to the original scientific contributions to which the relevant evidence is attached.

2. General characteristics of the publications and a reference to the original scientific contributions

For participation in the competition for academic position "Associate Professor" Dr. Boriana Vatchova has presented a list of 16 total publications, outside from those submitted in the procedure for "Doctor". These 16 publications are distributed in a monograph – 1 issue and 15 papers in journals and conference proceedings.

A monograph with a total of 128 pages from publishing house "Образование и Познание", Sofia is presented to fulfill the requirements of minimum of 100 points concerning indicators in Group B. The other 15 publications are involved in the formation of the points for the group of indicators D (2 publications with IF (Q3), 8 publications with SJR, 5 publications indexed in SCOPUS). The total number of points from these publications is equal to 280.

The main scientific contributions in the presented publications are as follows:

1) network structure model for knowledge extracting. This kind of models allows computing logical probabilistic values and probability of the given output. The presented model is with three inputs and one output.

2) method for modelling of multifactor nonlinear stochastic processes. It is possible not all production rules to be covered for the inputs. It is realized interpolation between existed close rules of the logical probabilistic function for additional production rules.

3) genetic algorithms method and gradient method for faster direction to the local extremum. The proposed new approach combines genetic algorithms and pseudo gradient method. Using these two methods there is achieved less number of experiments and there is changed the number of arguments in the fitness function. When it is used "pseudo gradient method" this leads to direct looking of the extremum.

The candidate is indicated the following scientific-applied contributions:

1) knowledge extracting method for non-stationary processes by combination of data packages using MLPF (multi-valued probabilistic functions),

2) logical method for knowledge extracting using experimental data sets for the technological process of flotation of the copper ore,

3) applications of the innovative rule based theory using for different kind of processes.

I accept the formulated 3 scientific contributions and first 2 from the presented 3 scientific-applied contributions, as the third can be referred to applications related to software implementations.

3. Reflection of scientific publications

In the documents for the competition, Dr. Boriana Vatchova has presented only 15 citations from the SCOPUS and WoS. According to the SCOPUS database, it has been found that for 9 of the publications in the competition, Dr. Boriana Vatchova has a total of 32 citations (excluding self-citations), which corresponds to 192 points in Group D.

4. Assessment of the personal contribution

Dr. Boryana Vachova is a single author for 2 of the presented publications for participation in the competition and of those in co-authorship, of which the candidate is the first author are also 2, while in the rest 11 it can be assume the equal participation with the other authors.

With the exception of the monograph, all other publications are in English. The submitted CV indicates that she has participated in 5 research projects and in a number of international seminars.

5. Critical remarks and recommendations

In most of the presented collective publications Dr. Boryana Vachova is not the first author. In this regard, I would recommend greater activity when working with other scientists. I also hope that her research and teaching work will continue in her studies for future PhD students.

6. Conclusion

Taking into account the above and the fact that the candidate satisfies all the necessary requirements of the Law on the Development of Academic Staff in the Republic of Bulgaria and its Rules for Implementation, as well as the Regulations of BAS and the Regulations on the specific conditions for acquiring academic degrees and occupying academic positions at IICT-BAS, I propose **Dr. Boryana Emilova Vachova to be elected to the academic position "Associate Professor" in the professional field 4.6 "Informatics and Computer Science", specialty: 01.01.12 "Informatics"**.

09.09.2019



Professor D.Sc. Daniela Borissova