

STATEMENT

by Assoc. Prof. Vladimir Monov,
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ABOUT

documents and scientific papers presented in the competition for the occupation of the academic position "Associate Professor"

Field of higher education : 4. Natural sciences, mathematics and informatics,

Professional field: 4.6 Informatics and computer science,

Specialty: Informatics,

announced in DV no. 41 of 21.05.2019 for the needs of section " Hierarchical systems "
at the Institute of Information and Communication Technologies-BAS
with the only candidate in the competition: Dr. Boriana Vatchova.

By order No 180 / 19.07.2019 of the Director of IICT-BAS, I am included in the Scientific Jury of the competition for occupation of the academic position "Associate Professor", announced in DV no. 41 of 21.05.2019. The only candidate, Dr. Boriana Vatchova, Assistant Professor at IICT, submitted materials for the competition. As a member of the Scientific Jury I have received the following candidate materials:

1. Application for participation in the competition;
2. European CV;
3. Copy of diploma for the educational and scientific degree "doctor";
4. Certificate of internship in the specialty;
5. List of scientific publications for participation in the competition;
6. List of citations;
7. Abstracts of the scientific publications for the competition - in Bulgarian and English;
8. Monography and copies of the scientific publications for participation in the competition;
9. Reference for meeting the minimum requirements of IICT;
10. Reference for the original scientific and applied contributions;
11. Declaration that there is no legally established plagiarism in scientific works;
12. Reference for other activities according to Paragraph 57a,(2) of Regulations for implementation of the Law for academic growth.

General characteristics of the materials presented

According to the materials presented, Assistant Professor Boriana Vatchova has acquired the educational and scientific degree "Doctor", as evidenced by the diploma No 33111 of 22.04.2009,

issued by the Higher Attestation Committee in the scientific specialty "Application of the principles and methods of cybernetics in different fields of science". Dr. B. Vatchova has a total working experience of 28 years, of which as a Research Associate III-II degree and Assistant Professor 24 years. The reference for fulfillment of the requirements of IICT-BAS for the occupation of the academic position "Associate Professor" shows that the requirements for all groups of indicators A, B, Г Д and E are fulfilled. A signed declaration of originality of the results in the scientific papers is attached. For the evaluation of applicants on additional indicators, a reference of the teaching activity and seminars conducted on European programs and projects during the period after the dissertation thesis defense has been provided. All the materials presented by Dr. Vatchova are prepared in accordance with the Law for academic growth, the Regulations for its implementation, as well as with the Rules of the specific conditions for acquisition of academic degrees and occupation of academic positions at IICT-BAS.

Evaluation of the scientific works

For participation in the competition the applicant has presented a monographic work with a single author Dr. B. Vatchova and fifteen publications, two of which are with single author and the others in co-authorship. Publications with single author are published by Springer and in the proceedings of a prestigious European conference, respectively. The co-authored publications are with the participation of foreign scientists, which shows the candidate's ability to work in a team, including with international participation. The subject of study in the monograph are processes in complex systems in different fields which are characterized by a large number of control variables, controllable and uncontrollable environmental factors, state and source product parameters. Submitted publications are indexed in Scopus and Web of Science databases, they are published in the period 2005-2019 and do not duplicate publications for doctoral degree. Two of the publications are in editions with Impact Factors (IF: 1.594 and IF: 1.426, respectively) and ten are in Impact Rank Issues (SJR). The results of the candidate's work are of scientific and scientific-applied character and relate to modeling of complex systems using fuzzy networks, methods for extracting knowledge from real data, building databases of rules of multi-valued logic for prediction, analysis and management of complex processes. These results undoubtedly show that the candidate Dr. Vatchova has extensive knowledge, experience and significant achievements in her research activities.

Evaluation of the citations

The list of citations provided includes fifteen citations of the candidate's works in publications of our and foreign authors. The citations are in prestigious publications that are indexed and referenced in the Scopus and Web of Science databases. The works cited are also published in known international journals and proceedings of international conferences, such as the International Journal of Knowledge-based and Intelligent Engineering Systems, the Journal of Intelligent & Fuzzy Systems, WSEAS Transactions on Circuits and Systems, the IEEE International Conference on Intelligent Systems. The data provided for the citations indicate that the applicant's scientific results have aroused interest and have been used in the works of both our and foreign scientists in the field of knowledge-based systems and intelligent control.

Scientific and applied contributions

I accept and appreciate positively the applicant's scientific and applied contributions as outlined in the attached reference for contributions. In summary, they include those developed by the applicant:

- a model with a network structure for extracting knowledge of complex processes;
- a method for modeling multifactor nonlinear stochastic objects;
- a method using a genetic algorithm and a gradient search to find the local extremum of a nonlinear function.
- a method of extracting knowledge of non-stationary processes by aggregating data using multi-valued logic and probability functions;
- a logical method for extracting knowledge from experimental data for the technological process for copper ore flotation;
- application of fuzzy network theory with a set of rules for modeling different types of complex processes and objects.

The listed contributions are stated in details and analyzed in the published scientific papers submitted for participation in the competition. All of them represent significant and internationally recognized achievements in the applicant's work.

General characteristics of the applicant's activities

Dr. Vatchova's scientific and research activities are in the field of modeling and analysis of complex systems using fuzzy networks, knowledge-based systems and intelligent control, logical methods for data extraction and processing under uncertainty. In this area, the applicant has an active publishing work, including with the participation of foreign scientists.

As an Assistant Professor at IICT_BAS, Dr. Vachova participates in the work on implementation of international and national projects, including:

- Project under the 7th EU Framework Program "Advanced computing for innovation" (AComIn), grant No. 316087;
- Development of an individual project on the topic "Adaptive methods of complex processes characterized by uncertainty, non-linearity and non-stationarity", sponsored by DAAD, Technical University Dresden, Germany;
- Project under procedure BG161PO003-1.1.06-0023-C0001 "Support for research and development of Bulgarian enterprises" on the topic: "Analysis and identification of dependencies in large data sets - an application for economic and technological analyzes";
- Project under the 6th EU Framework Program 027178 "Virtual Internet Service Provider VISP", 2005-2008;
- Project "Integration of GPS functionality in an information system for optimizing the inter-management activities with administration to coordinate specialized services", under contract with the Innovation Fund 4IF-02-87 / 7.3.2008 to the Executive Agency for Promotion of Small and Medium-Sized Enterprises;

- Project INPORT DVU01 / 0031, "Development of software and Internet-based applications for teaching investment analysis and portfolio optimization", under contract with the Science Research Fund of the Ministry of Education, Youth and Science.

In the period 2011-2019, Dr. Vatchova successfully coordinated projects within the programs Erasmus and Erasmus + under bilateral cooperation agreements between IICT-BAS and the University of Portsmouth, UK. As a result, durable fruitful contacts and successful joint activity of scientists on both sides were realized.

Dr. Vatchova has been teaching at the Higher School of Telecommunications and Post in 2015-2019 as a lecturer of the courses "Basics of Informatics" for bachelors (210 hours) and "Software Engineering" for masters (390 hours).

According to the materials provided, the applicant under this procedure is actively involved in numerous seminars organized by both our and international scientific organizations.

Notes and recommendations

I have no substantive remarks on the materials submitted by the applicant for the competition. I would recommend a continuation of Dr. Vatchova's scientific and research activities by expanding and deepening collaborative research with foreign scientists, as well as by training of PhD students and young scientists.

Conclusion

The materials for the competition and the applicant's results presented therein satisfy the requirements of the Law for academic growth, the Rules for its implementation, the Rules for the conditions and the order for acquiring scientific degrees and occupying academic positions in BAS, as well as the Rules for the specific conditions for acquiring scientific degrees and occupation of academic positions in IICT. My assessment of the applicant's overall activity is positive.

I strongly recommend that the distinguished Scientific Jury vote on a proposal to the Scientific Council of IICT-BAS to select Dr. Boriana Vatchova for occupation of the academic position „Associate Professor“ in the Professional Field: 4.6 Informatics and computer science, Specialty: Informatics, for the needs of the section " Hierarchical systems " at IICT_BAS.

Sofia,

22.08.2019 г.

Signature:

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/Assoc. Prof. V. Monov/