

Report
on a competition for the occupation of an academic position
"Professor"
in the scientific specialty of Informatics and Computer Science (Software Technologies -
Data Mining),
for the needs of Sofia University "St. Kliment Ohridski "(Sofia University),
Faculty of Mathematics and Informatics (FMI),
declared in the State Gazette no. 52 of 2 July 2019 and on the websites of FMI and SU

The report was prepared by: Prof. DSc Peter Lubomirov Stanchev, Institute of
Mathematics and Informatics at the Bulgarian Academy of Sciences, as a member of the
competition jury in Informatics and Computer Science under the competition according to
Order No. ПД 38-525 / 28.08.2019. of the Rector of Sofia University.

Only one candidate has applied for participation in the announced competition: Assoc. Prof. Dr. Olga Ilieva Georgieva, SU, FMI.

I. General description of the materials presented

1. Details of the application

The submitted documents from the applicant comply with the requirements of ЗРАСРБ, ППЗРАСРБ and the Regulations on the conditions and procedure for acquiring scientific degrees and occupying academic positions at Sofia University "St. Kliment Ohridski" (ПУРПИНСАДСУ).

Of the 21 papers reviewed, 15 have been published abroad and the remaining 6 have been published in Bulgaria in internationally recognized forums and publications. Of the papers presented, 2 are book chapters, 6 are articles in peer-reviewed scientific journals and 13 are papers presented at international conferences and published in conference proceedings. Out of the 21 publications, there are 5 independent works, of which the remaining 16 papers in 9 the candidate is the first author. Twenty of the publications featured were referenced in SCOPUS, 8 of which were referenced in Web of Science as well. One paper is referenced in MathSciNet.

The following candidate materials were presented to me: Autobiography, Diploma of higher education, Diploma of educational and scientific degree "Doctor", Document of scientific title, Certificate of seniority in the specialty, Documents proving the fulfillment of the requirements of art. 115, para. 1, item 1, List of publications, Reference by the Author system, Reference for meeting the minimum national requirements for the respective scientific field and the additional requirements of SU "St. Kliment Ohridski", Reference for citations, Reference for original scientific contributions, Reference for indicators under Art. 122, para. 2, Scientific papers submitted for participation in the competition, Abstracts of the peer-reviewed publications in

Bulgarian and one of the languages traditionally used in the respective scientific field, Copy of the announcement in the State Gazette.

2. Details of the applicant

Assoc. Prof. Olga Ilieva Georgieva graduated from the Secondary School of Mathematics "Acad. Kiril Popov, Plovdiv, 1981, holds a Master's Degree in Automation from the Technical University - Sofia, 1986 and a Doctorate in Process Control from the Institute of Control and Systems Research, BAS, 1995. Now she is the Head of Software Engineering Department, FMI SU "St. Kliment Ohridski"; from 2008 - till now she is a senior lecturer of II degree in Informatics, Department of Software Engineering, FMI SU "St. Kliment Ohridski"; from 2000 to 2008 is a senior lecturer of II degree in Process Control, Institute of Control and Systems Research (ICSR), BAS; from 1996 - 2000 is a lecturer of I degree, Institute for Control and Systems Research, BAS; 1995 to 1996 a lecturer of II degree at ICSR, BAS; from 1994 to 1995 is an engineer, ICSR, BAS; from 1993 to 1994 is an engineer at the Central Laboratory of Bioinstrumentation and Automation, BAS; from 1988 to 1993 is a PhD student, Central Laboratory of Bioinstrumentation and Automation, BAS.

3. General characteristics of the applicant's scientific work and achievements

Olga Ilieva Georgieva's scientific works can be distinguished in the following groups: A new approach for real-time data structure identification is proposed [B1, B2, B9, B10], a new method for non-iterative data clustering is proposed, that finds significant clusters among noise data [B3, B21], A new approach is proposed for selecting a software service based on a comparison of an integrated (aggregated) quality assessment of software services providing the same functionality [B18, B20]. An approach for recognizing human conditions is proposed by analyzing brain activity data [B4, B5, B11, B13]. A fuzzy linguistic model evaluating software reliability has been developed [B12]. A method for selecting a software service based on quality characteristics data and which takes into account the inaccuracy in the service quality information is proposed [B7, B14, B15, B16, B17], A model for recognizing the style of play in educational games by linear regression [B8], A neural network model of determination of the values of electric power consumption of an electric arc furnace, depending on the chemical composition of the charged mixture [B6], Regression model for recognition of loss of attention has been developed [B19].

a) the scientific works comply with the minimum national requirements (under Art. 2b, para 2 and 3 of the ЗПАСРБ) and respectively with the additional requirements of the Sofia University "St. Kliment Ohridski" for the occupation of the academic position of "Professor" in the scientific field and professional direction of the competition;

(b) the scientific papers submitted by the applicant do not repeat those of previous procedures for the acquisition of a scientific title and academic position;

c) there is no proven plagiarism in the scientific works presented at the competition.

4. Characterization and evaluation of the applicant's teaching activity

Information about the indicators under art. 122, para. 2 Assoc. Professor Olga Ilieva Georgieva has one PhD candidate that has defended, one with the right of defense and one current, 10 graduates master degree from FMI SU. She has developed 3 lecture courses - Software requirements analysis, Models of software systems, Fuzzy sets and applications, has led 3 scientific seminars, delivered 4 lectures and one full lecture course at foreign universities, has read 4 courses in a foreign language and has one successfully defended foreign graduate.

5. Comprehensive analysis of the scientific and applied scientific achievements of the candidate contained in the materials for participation in the competition

In connection with the developed approach for identification of the data structure in real time, a new approach for clustering has been created. An algorithm-based approach has been developed. The presented approach for identifying the real-time data structure has been successfully applied in the structural identification of a model of software reliability growth dynamics in the software product testing process.

In conjunction with an established non-iterative data clustering method that detects significant clusters among noise data, an algorithm has been created that can be used to detect one or more interesting clusters that cover only part of the dataset or self-complete structuring of the data space.

An approach for selecting a software service is proposed based on the comparison of an integrated (aggregated) evaluation of the quality of software services providing the same functionality.

An approach for recognizing human states by analyzing brain activity data is proposed. An approach for recognizing human emotions by analyzing EEG data is presented.

A fuzzy linguistic model for evaluating software reliability has been developed. In order to reflect the inaccuracy in the available data, a model for evaluating the reliability of software using fuzzy set theory and logic is proposed.

A method of selecting a software service based on certain quality features is proposed. It takes into account the inaccuracy in the service quality information.

A model has been developed to recognize the style of play in educational games through linear regression.

A neural network model has been developed for determining the values of the electric energy consumption of an arc furnace depending on the chemical composition of the charged mixture.

A regression model for recognition of loss of attention has been developed. A regression approach is proposed for detecting variable levels of attention based on spatial-temporal data extracted from EEG records.

All of the candidate's scientific papers in the citation list provided are referenced in Scopus. All submissions citing the applicant's publications are also referenced in Scopus.

The candidate has implemented a large number of sophisticated algorithms.

6. Critical notes and recommendations

In publications, more emphasis should be placed on the proposed algorithms and less on their implementation.

7. Personal impressions of the applicant

I don't know the candidate.

8. Conclusion on the application

Having become acquainted with the materials and scientific works presented in the competition and on the basis of the analysis of their importance and the scientific and applied contributions contained therein, I **confirm** that the scientific achievements comply with the requirements of the ЗРАСРБ, the Regulations for its implementation and the corresponding Regulations of Sofia University "St. Kliment Ohridski" for the position of the candidate in the academic position "Professor" in the scientific field and professional direction of the competition. In particular, the applicant satisfies the minimum national requirements in the professional field and no plagiarism has been found in the scientific papers presented at the competition.

I give my **positive grade** to the application.

II. GENERAL CONCLUSION

On the basis of the above, I **recommend** that the scientific jury propose to the competent body for the selection of the Faculty of Mathematics and Informatics at Sofia University "St. Kliment Ohridski" to choose Assoc. Prof. Olga Ilieva Georgieva to take the academic position of "professor" in the professional field of Informatics and Computer Science (Software Technologies - Data Mining).

October 16, 2019

Prepared the report:

(Prof. DSc Peter Stanchev)