REPORT
on a competition for occupation of the academic position "Professor" in professional field 4.6 Informatics and Computer Science (Software Technologies – Data Mining), announced in State Gazette No. 52 of July 2, 2019 by Sofia University St. Kliment Ohridski (SU), Faculty of Mathematics and Informatics (FMI)

This review is prepared by Prof. Dr. Maria Nisheva-Pavlova from Sofia University St. Kliment Ohridski, FMI, as a member of the scientific jury for the competition according to Order No. РД 38-525/28.08.2019 of the Rector of SU.

One applicant has submitted documents for participation in the announced competition: Dr. Olga Ilieva Georgieva, Associate Professor at FMI, SU.

1. General description of the materials presented

The documents of the applicant comply with the requirements of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (ADAPRB), the Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (RIADAPRB) and the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of Academic Positions at SU (RTCAADOAPSU).

The applicant has submitted for the competition:

- Professional autobiography,
- Copy of diploma for higher education,
- Copy of diploma for educational and scientific degree "Doctor",
- Copy of certificate for occupation of the academic position "Associate Professor",
- Certificate of internship in the speciality,
- Documents proving the fulfillment of the requirements of Art. 115, para. 1, item 2 of RTCAADOAPSU,
- Lists of publications (list of all publications and list of publications presented at the competition),
- List of publications, presentations, projects and supervision activities, generated by the information system of SU,
- Reference for the fulfillment of the minimum national requirements and the requirements of SU for the professional field 4.6 Informatics and Computer Science,
- Lists of citations of publications of the applicant in articles in Scopus,
- Reference for original scientific contributions,
- Reference for the degree of fulfillment of the indicators under Art. 122, para. 2 of RTCAADOAPSU,
- Copies of publications presented at the competition,

- Abstracts of the publications presented at the competition (in Bulgarian and in English),
- Copy of the competition announcement in the State Gazette.

The documents of the applicant have been prepared carefully and in full compliance with the requirements of RTCAADOAPSU.

2. Details of the applicant

The applicant Assoc. Prof. Dr. Olga Georgieva has a technical degree, completed in 1986 at the Technical University – Sofia. In 1995 she received a doctoral degree. Until 2008, she worked consecutively as an engineer, research associate and associate professor in various departments of the Bulgarian Academy of Sciences, and from 2008 until now holds an academic position of associate professor at the Department of Software Technologies at FMI, SU. She was a visiting professor at the University of Applied Sciences – Braunschweig/Wolfenbüttel, Germany.

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

The research activities of Assoc. Prof. Dr. Olga Georgieva and the topics of her scientific works are entirely in the field of competition. The publications with which she participates in the competition do not repeat those of the previous procedures for the acquisition of her doctoral degree and for the occupation of the academic position of associate professor.

Five of the scientific papers submitted for participation in the competition are single-authored and the remaining 16 are co-authored. I have no doubt about the applicant's significant personal contribution to the collective publications.

There is no proven plagiarism in the scientific works of Assoc. Prof. Dr. Olga Georgieva.

In accordance with the requirements under Art. 1a, para. 1 of the RIADAPRB, the candidates for an the academic position of professor in professional field 4.6 Informatics and Computer Science must have: 50 points in group of indicators "A", at least 100 points in group of indicators "B", at least 200 points in group of indicators "Г", at least 100 points in group of indicators "Д", at least 150 points in group of indicators "E".

RTCAADOAPSU does not define higher additional requirements than those specified in the RIADAPRB.

According to the submitted documents the applicant covers:
- 50 points in group of indicators "A",
- 222 points in group of indicators "B",
- 426 points in group of indicators "Г",
- 1888 points in group of indicators "Д",
- 270 points in group of indicators "E".

Therefore, the minimum national requirements and the additional requirements under Art. 1a, para. 2 and para. 3 of the RIADAPRB for occupation of the academic position of "Professor" in the professional field 4.6 Informatics and Computer Science have been completely covered and exceeded by Assoc. Prof. Dr. Olga Georgieva.

4. General characteristics of the applicant's teaching activities

The teaching activities of Assoc. Prof. Olga Georgieva are considerable in scope and diverse in content. She teaches the compulsory courses in Analysis of Software Requirements and Software Systems Modeling for BSc students in Software Engineering at FMI. She teaches also the elective courses in Fuzzy Sets and Their Applications and Professional Ethics for different Master's programs at FMI. She has lectured in English for foreign students at FMI.

Assoc. Prof. Georgieva has developed teaching materials in electronic format for three academic courses. She has supervised 10 successfully defended MSc theses. She has been the scientific supervisor of two PhD students (one defended and one ended with the right of defense) and currently supervises one more PhD student. She works actively with her PhD students and graduate students and has a total of 13 collaborative research publications with them.

5. Substantive analysis of the scientific and applied scientific achievements of the applicant, presented in the materials for participation in the competition

The scientific papers, presented by Assoc. Prof. Olga Georgieva for participation in the competition, contain original research results, which can be grouped and summarized as follows:

- Group 1: *Approaches and methods for data clustering*. A new clustering approach is proposed that identifies the real-time data structure when data is received in a stream. This approach is applicable to many practical problems: performance analysis of dynamic systems, prediction and modeling of time series data, diagnostics, process management, etc. It has been expanded to provide a new solution to the problem of defining the cluster radius. A new procedure for dynamic decision making in classification problems for the case of streaming data is formulated. A new method for non-iterative data clustering is proposed, which identifies significant clusters in noise data.

- Group 2: *Approaches and methods for software service selection*. A new approach for web service selection is proposed, based on cluster analysis of metrics data for the quality characteristics of the services accumulated over time. A method of software service selection based on quality features of the software is proposed, which takes into account the inaccuracy in the quality of service information.

- Group 3: *Models for software reliability assessment*. A fuzzy linguistic model for software reliability assessment has been developed. The accuracy of the model is illustrated by an available software reliability dataset. The values obtained using the

model are comparable to those obtained by the widely used probabilistic model of Jelinski-Moranda, but the fuzzy model is more accurate in predicting reliability at a later stage of the testing process.

- Group 4: *Models of educational games*. A model for playing style recognition in educational games through linear regression has been developed. The recognized styles of play or learning through this model are suitable for implementation of the stylistic adaptation of didactic content in educational games.
- Group 5: *Approaches for recognizing conditions in humans*. An approach for human emotions recognition by analyzing data on brain activity (electroencephalography and visual perception data) is proposed. A regression model for automatic detection of attention lapses has been developed and analyzed.

In my opinion, the aforementioned results characterize the candidate Assoc. Prof. Dr. Olga Georgieva as a well-established scientist with significant achievements, which give reason to claim that she completely covers the concept of a leading researcher in the field of informatics.

The significance of the applicant's research results is evidenced by their reflection in the works of other authors. Dr. Olga Georgieva submitted data for a total of 236 citations of publications, with which she participates in the competition, in articles of other authors that were referenced and indexed in Scopus.

6. Critical notes and recommendations

I have no significant critical comments on the materials in the competition and in particular on the scientific works of Assoc. Prof. Dr. Olga Georgieva. I recommend her to focus on working more actively with postgraduate and doctoral students and thus to contribute more fully to the preparation of the next generation of informatics researchers.

7. Personal impressions of the applicant

I have excellent personal impressions of the professionalism, precision, thoroughness and efficiency in the work of Assoc. Prof. Olga Georgieva. I appreciate her collegiality and cooperativeness and her ability to create a good creative atmosphere around her.

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 significance and the scientific and applied scientific contributions contained therein, I **confirm** that the academic achievements of the candidate Assoc. Prof. Dr. Olga Georgieva meet the requirements of the ADAPRB, the Regulations for its implementation and the corresponding Regulations of SU for the occupation of the academic position of "Professor" in the professional field "Informatics and Computer Science". In particular, the applicant meets the minimum national requirements in

the professional field and no plagiarism has been detected in her scientific papers submitted at the competition.

I give a **positive assessment** of the application of Assoc. Prof. Dr. Olga Georgieva.

GENERAL CONCLUSION

Based on the above, **I strongly recommend the scientific jury to vote on a proposal to the Council of the Faculty of Mathematics and Informatics of Sofia University St. Kliment Ohridski to select Assoc. Prof. Dr. Olga Ilieva Georgieva for the academic position of "Professor" in the professional field 4.6 Informatics and Computer Science**.

October 25, 2019   Assessor: ....

(Prof. Dr. Maria Nisheva-Pavlova)