

STATEMENT REPORT

**On the competition for the academic position of “Associate Professor”
In the Scientific field: 4. Natural Sciences, Mathematics and Informatics,
Professional field: 4.6. Informatics and Computer Sciences,
Scientific specialty: Informatics (Human-Computer Interaction),
For the needs of the Institute of Mathematics and Informatics, BAS,
Competition announced in State Gazette no. 52 (02.07.2019)**

This statement report has been prepared by Associate Professor Maya Miteva Stoyanova, Department of Algebra, Faculty of Mathematics and Informatics, Sofia University “St. Kliment Ohridski”, as a member of the scientific jury for the competition according to Order No. 322 / 02.09.2019 of the Director of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences.

Documents from one candidate, namely Assistant Professor Todorka Gerasimova Alexandrova, PhD, Department of Mathematical Foundations of Informatics, Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS), were submitted in time for participation in the announced competition.

I. General description of the procedure and submitted documents

1. Details of the procedure and documents

The documents submitted by the candidate in accordance with the competition comply with the requirements of the Act for the Development of the Academic Personnel of the Republic of Bulgaria (ADAP of the RB), the Rules for Implementation of the ADAP of the Republic of Bulgaria (RIADAP of the RB) and the Rules on the Terms and Requirements for Acquisition of Scientific Degrees and Occupation of Academic Positions of IMI and BAS.

Assist. Prof. T. Alexandrova obtained her PhD degree from the University of Electro-Communications, Tokyo, Japan and her doctoral diploma has been officially recognized by the Scientific Council of IMI, BAS, in accordance with the statutory procedure.

The set of the documents submitted by the candidate show that Assist. Prof. Todorka Alexandrova meets the requirements of Art. 24 of the ADAP of the RB, and Art. 53 of the RIADAP of the RB for the occupation of the academic position "Associate Professor".

2. Short CV of the applicant

Todorka Gerasimova Alexandrova was born in 1978 in Sofia. From 1996 to 2003 she was a student at the Faculty of Mathematics and Informatics, Sofia University “St. Kliment Ohridski”. During 2001-2002 she spent one year as an exchange student at the University of Elec-

tro-Communications, Tokyo, Japan. I know Todorka Alexandrova from her master`s program specialization at the Department of Algebra, FMI, Sofia University and her master`s thesis defense in 2003.

From 2002 to 2015 she was a mathematician at the Department of Mathematical Foundations of Informatics, IMI, BAS, with periods of part-time employment or unpaid leave due to study or work abroad.

Todorka Alexandrova received her PhD degree in 2008 from the University of Electro-Communications, Tokyo, Japan after defending her doctoral thesis with title “A Study on (t, n) Threshold Secret Sharing Schemes Based on the Generalized Vector Space Construction”. The obtained in Japan PhD degree was officially recognized in March 2019 by the Scientific Council of IMI, BAS, in accordance with the statutory procedure.

From 2009 to 2018 she worked at universities in Japan consequently as assistant professor and associate professor.

Since November 2018 she has been working as an assistant professor at the Department of Mathematical Foundations of Informatics, IMI, BAS.

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

The full list of publications of Assist. Prof. Todorka Alexandrova consists of 51 publications and for participation in the current competition 22 scientific publications have been presented. From the materials submitted for the competition: 3 papers are published in specialized international journals with impact factor (IF) and the corresponding quartile in Web of Science, 5 papers are published in scientific editions with SJR rank (SJR, SCOPUS), 12 papers are published in conference proceedings that are indexed by Scopus and 2 publications are visible in ACM Digital Library. All papers are co-authored which shows the good team work abilities of the candidate. The scientific results published in the materials submitted for the competition have been presented at large number of international conferences.

All 22 materials presented for the competition are published after obtaining the PhD degree of the candidate. From the documents it is clear that the scientific materials have not been used in previous procedures for acquiring academic degree or academic position, and that there is no plagiarism in them.

From the report submitted by Assist. Prof. Todorka Alexandrova, PhD, for the fulfillment of the minimal national requirements (under Art. 2b, (2) and (3) of the ADAP of RB) and the additional requirements (Art. 2., (2) from the Rules on the Terms and Requirements for Acquisition of Scientific Degrees and Occupation of Academic Positions of the IMI, BAS) under a competition for occupation of an academic position of "Associate Professor" in Professional field 4.6. Informatics and Computer Sciences, accompanied by the necessary evidences for verification in the world

scientific information databases, shows that the applicant exceeds both the minimal national requirements and the specific ones of the internal regulations of IMI and BAS.

4. Description and evaluation of the candidate`s teaching experience

Assist. Prof. Todorka Alexandrova has taught various mathematics and computer science courses at Waseda University, Tokyo, Japan. She has led an international research project at Waseda University and is currently participating in an national research project. The candidate has participated as a research advisor in the supervision of the graduation theses of bachelor, masters` and PhD students at Waseda University and Tokyo Metropolitan University. Todorka Alexandrova received Waseda University Teaching Award, Fall 2016, for Introduction to Probability and Statistics course, and has been honored in the top 10 of the Outstanding Young Persons of Bulgaria for year 2018 in the category of “Academic leadership and/or accomplishment”. She speaks English and Japanese.

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

Todorka Alexandrova's scientific interests and research work are in the areas of information security, cryptography, network security, human-computer interaction and information technology. The scientific materials presented for the competition can be organized in the following three groups:

A) Using crowdsourcing for knowledge search and exchange (papers numbered 5, 6, 16, 18, 19 and 20 in the list with the publications for participation in the competition). Publications 16, 19 and 20 introduce a mobile crowdsourcing platform called UbiAsk, and publication 6 describes a proposed MoboQ service that has been implemented in China. The results published by the candidate show not only the importance of her scientific achievements but also their practical applications.

B) Secret sharing schemes` applications (papers numbered 10, 21 and 22 in the list with the publications for participation in the competition). These publications discuss several applications of secret sharing schemes as a continuation and application of Alexandrova`s doctoral dissertation research topic.

B) Navigating human behavior by enhancing the real world with information technologies (papers numbered 1, 2, 3, 4, 7, 8, 9, 11, 12, 13, 14,15 and 17 in the list with the publications for participation in the competition). These publications adress various problems and aspects in the area of human-computer interaction, which is the specialty field of the current competition. The authors analyze the paper-based version of a popular Trading Card Game and the one played on a computer, and propose a new Augmented TCG enhanced with augmented reality that include virtul characters to represent the players in the game. The idea is to improve the real objects by introducing virtual forms to them. The presented scientific papers and their results show that T. Alexandrova is very

familiar with and successfully works in these important for society and innovative topics that aim to navigate human behavior by improving and enhancing the real world with the help of information technologies.

The abstracts of the publications and the summary of the scientific contributions presented by the candidate reflect accurately and clearly the contents and the results of the publications.

6. Personal impression of the applicant

As mentioned above, I have known Assist. Prof. Todorka Alexandrova, PhD, since 2003 and I have excellent impression of her personal and professional qualities. All publications presented for the competition are co-authored, with some of them co-authored with her students, which shows that the candidate works excellently in a team as well as has very good research leading abilities. All this shows her professionalism and leads to the conclusion that Todorka Alexandrova's contribution to the joint scientific publications is equivalent.

7. Conclusion on the application

Having become acquainted with the documents and scientific papers 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 meet the requirements of the ADAP of the Republic of Bulgaria, the Rules for its Implementation and the corresponding Rules of the Bulgarian Academy of Sciences and the Institute of Mathematics and Informatics for the occupation by the candidate of the academic position "Associate Professor" in the scientific field and professional field of the competition. In particular, the applicant meets the minimal national requirements in the professional field and no plagiarism has been detected in the scientific papers submitted for the competition. I **give my positive opinion** to the application.

II. GENERAL CONCLUSION

On the basis of the above said, I **strongly recommend** to the Scientific Jury of the competition to propose to the Scientific Council of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences to select Assistant Professor Todorka Gerasimova Alexandrova, PhD, for the academic position "Associate Professor" in professional field 4.6 . Informatics and Computer Sciences, Scientific specialty: Informatics (Human-Computer Interaction).

26.10.2019

Signature:

Associate Professor Maya Stoyanova, PhD