R E V I E W

on a competition for academic position of "Professor"
in Professional Area 4.6 "Informatics and Computer Science",
Scientific Specialty "Informatics (Information Modelling)",
announced in the State Gazette, Vol. 98 from 13 December 2019
for the needs of the Institute of Mathematics and Informatics
at the Bulgarian Academy of Sciences, with a single candidate
Assoc. Prof. Zlatinka Svetoslavova Kovacheva, PhD

1. Assoc. Prof. Zlatinka Kovacheva was born on 26 July 1958 in Sofia. She graduated from Sofia University "St. Kliment Ohridski" in 1981 in the "Foundations of Cybernetics and Control Theory" Department. In 1987, she defended a Ph. D. thesis. She worked at the Central Institute of Computational Technique and Technologies, Sofia (1981-1987), Technical University of Sofia (1984-1986 and 1989-1991), Institute of Information, Communication and Automatized Systems, transformed into Centre of Information Technologies in Communications (1987-2003), Higher School of Telecommunications and Posts (2003-2005), where she obtained the academic position of Associate Professor in 2004, and from 2005 to 2018 she was a lecturer in Oman, where from 2013 to 2018 she occupied the position of Professor and Head of the Department of Mathematics and Applied Sciences. Since 2018 she has been in the Institute of Mathematics and Informatics – BAS. Since February 2019 she has been working on a second labour contract as Associate Professor in the University of Mining and Geology, Sofia.

From the presented documents it is seen that the applicant has more than 5 years of relevant working experience as Associate Professor in Bulgaria, hence she satisfies the requirements of Art. 29 (1), item 2 of the Academic Staff Development Act in Republic of Bulgaria and Art. 60 (1), item 2 of the Implementing Rules of the Law.

2. In the following table, the total number of applicant's scores and the required minimal scores per groups of scientometric indicators are presented in accordance to Art. 2 (1) of

the *"Regulations of the terms and conditions for obtaining academic degrees and occupying academic positions at the Institute of Mathematics and Informatics – BAS"*:

Scores for Field 4. Natural Sciences, Mathematics and Informatics
for the academic position of "Professor":

Group of indicators	Minimal number of scores	Number of scores of the applicant
А	50	50
Б	-	-
В	100	102
Г	220	235
Д	140	1152
Е	150	210

For participation in the competition, Assoc. Prof. Kovacheva has presented:

A) In lieu of a habilitation thesis – 10 publications, of which:

- 2 papers in journals with impact-factor and in quartiles Q2 and Q3;

- 3 papers in journals without impact-factor;

- 5 communications at international conferences – in Bulgaria, France, Oman, Spain, and Turkey.

B) 22 other papers, of which:

- 2 papers in journals with impact-factor and in quartile Q4;

- 6 papers in journals without impact-factor;

- 1 chapter in a book of IFSA – International Fuzzy Systems Association;

- 13 communications at international conferences – in Abu-Dhabi, Brazil (2), Bulgaria (4), Greece (2), France, Italy, Japan, and Portugal.

Three of the conference proceedings have been published in Springer (with SJR-factor). Other six publications also have an SJR-factor.

In total, 10 of the presented publications are in editions with IF or SJR, hence the requirement of Art. 3 (1), item 3 of *"Regulations of the terms and conditions for obtaining academic degrees and occupying academic positions at the Institute of Mathematics and Informatics – BAS"* is satisfied.

I accept the contributions of Assoc. Prof. Kovacheva presented in her documents, in *"Author's annotation of the scientific and applied-scientific contributions in the works presented by Dr. Zlatinka Kovacheva for participation in a competition for Professor"*. In my opinion, they correctly reflect the contents of the publications with which she participates in the competition, which is why I will not comment on them in detail. I will just note that they have been grouped by the applicant into the following five groups, and I agree that this grouping is appropriate:

1. OLAP,
2. Big Data,
3. Data Mining,
4. Neural Networks,
5. Second Order Impulsive Differential Equations with Nonlocal Conditions.

I shall note that for me the most interesting are the results from the first, the third and the fourth groups. In my opinion, in the future the results from the first group [6, 25, 30] can be described by indexed matrices, and the elements of the OLAP-cube can be estimated by intuitionistic fuzzy estimates which will yield them additional accuracy. To me, the most interesting is paper [30] having a scientific character, while the other two are of applied-scientific character. The two papers [2, 13] and the two conference communications [19, 28] from the second group are of applied-scientific character. Of interest from the point of view of informatics are paper [9] and communications [8, 18] which fit into the third group and are of applied-scientific character. The most numerous are the publications from the fourth group. Papers [5, 10, 11, 12, 22, 23, 26, 29, 32] and conference communications [1, 3, 7, 14, 15, 16, 17, 24, 27, 31] are of scientific character. In my point of view, it would be interesting in the future to construct generalized nets describing the functioning and the results of the work of the neural networks from [5, 16, 23, 26], a thing that has not been done until now. The last, fifth group, contains three papers [4, 20, 21] in the field of differential equations. I do not feel competent enough to

evaluate them but, for instance, the fact that paper [4] is in a journal with impact-factor, is indicative for its high quality.

There are no data about defended doctoral students of Assoc. Prof. Kovacheva, but she has supervised 4 graduate students of the bachelor programs of the Higher School of Telecommunications and Posts.

All but two papers – [10, 32] – were published in the years after the habilitation (2004). Only the two cited above are from 2004. I do not have the list of publications with which Assoc. Prof. Kovacheva has participated in her competition for the academic position of Associate Professor, neither does it become clear from the *"List of publications by Zlatinka Svetoslavova Kovacheva (Beleva)"* I have been provided with, but in view of the rate at which procedures were running years ago (at that time I was a member of the Specialized Scientific Council in Electronic and Computer Technique, where I am informed from) it is certain that these two papers did not participate in her previous competition. This is confirmed by the declaration signed by the applicant in Appendix 3.1.

For participation in the competition, Assoc. Prof. Kovacheva has provided data about 202 citations (of 7 of her papers) and 11 citations in dissertations and abstracts of dissertations abroad. This number by far exceeds the requirements of *"Regulations on the terms and conditions for obtaining academic degrees and occupying academic positions at the Institute of Mathematics and Informatics – BAS"*.

3. According to the data I have been provided with, Assoc. Prof. Kovacheva is the author of a total number of 70 publications, and 5 textbooks and teaching manuals, and the total number of her citations is 263, of which 202 are in Web of Science or Scopus.

4. From the provided CV, it is seen that she has delivered lectures and tutorials in a very wide range of disciplines: Higher Mathematics Parts 1, 2, and 3, Statistics, Numerical Methods, Mathematical Analysis, Discrete Mathematics, Foundations of Programming, Information Technologies, etc. She has also provided data of participation as a project leader or participant in 9 scientific research projects, some of which were implemented into practice.

I do not know personally Assoc. Prof. Kovacheva.

All of the above justifies my positive evaluation of the materials presented for participation in the competition, and my recommendation to the respected members of the Scientific Jury to vote positively for awarding **Assoc. Prof. Dr. Zlatinka Svetoslavova Kovacheva** with the **academic position** of **"Professor"** in Professional Area **4.6 "Informatics and Computer Sciences"** and code **01.01.12 "Informatics".**

2 April 2020   Reviewer: ……………………………………………

(Corr. Member Prof. Krassimir Todorov Atanassov, DSc DSc, "Bioinformatics and Mathematical Modelling" Department, Institute of Biophysics and Biomedical Engineering – BAS, Sofia)