

R E V I E W

by Prof. DSc Stoyan Nedkov Kapralov

on the materials

submitted for participation in the selection process

for the academic position "Associate Professor"

in the field of higher education

4. Natural Sciences, Mathematics and Computer Science

Professional field 4.6 Informatics and Computer Sciences

(Algorithms and Models for Data Analysis),

announced in the State Newspaper no. 57 / 26.06.2020

by Plovdiv University "Paisii Hilendarski"

1. Data for selection process

Pursuant to Order № P33-4128 / 25.08.2020 of the Rector of the University of Plovdiv "Paisii Hilendarski" I was appointed a member of the scientific jury in the selection process for associate professor and by decision of the First meeting of the scientific jury, Meeting Minutes #1 from 08.09.2020, I was selected as a reviewer.

There is only one candidate in the selection process - Ch. Assistant Professor Dr. Kremena Vasileva Stefanova from FMI at PU.

2. Details of the candidate

Kremena Stefanova graduated from Plovdiv University "Paisii Hilendarski", respectively, in 2010 with a bachelor's degree in Mathematics with a grade of Excellent 5.91 and in 2011 with a master's degree in Business Informatics with English with a grade of Excellent 6.00.

In 2012 she defended a dissertation on "Qualitative methods for some special types of differential equations" and attained an educational and scientific degree "Doctor".

Since 2013 she is a senior assistant professor at the FMI of Plovdiv University.

3. Compliance of the presentation of scientific papers and materials with the requirements for PPZRASRB

For participation in the selection process for associate professor Dr. Stefanova presented a list of 18 publications. The list does not include publications with which the candidate has obtained the educational and scientific degree "Doctor".

By type the publications are as follows:

- 12 articles
- 2 reports
- 3 monographs
- 1 textbook

All scientific papers are in English, except for one of the papers, which is in Bulgarian. One of the articles is independent, four of the scientific papers are by two co-authors, seven by three co-authors and the others are with 4 or 5 co-authors.

According to the Regulations for the implementation of the ZRAS in the Republic of Bulgaria, the candidate for the academic position of "Associate Professor" must meet certain minimum requirements in several groups of indicators. The achievements of Ch. Assistant Professor Dr. Kremena Stefanova significantly exceed the minimum requirements:

	Indicators				
	A	Б	B	Г	Д
Minimum requirements	50	0	100	200	50
Dr Stefanova	50	0	210	377	252

Particularly impressive are the candidate's achievements in Indicator D. The report in Scopus shows that Kremena Stefanova is very well placed in the international scientific community, and so far has 30 citations and a Hirsch index $h = 5$.

4. Scientific contributions

The research of Ch. Assistant Professor Dr. Kremena Stefanova is in several scientific fields.

On the topic Computer modeling of discrete neural networks she has presented 5 articles and one monograph. These publications are from 2019 and 2020. An important part of the studies is the computer simulation of the considered models. To those means a variety of tools such as C ++, C # and Wolfram Mathematica are used. On the one hand, computer simulations illustrate the theoretical results and on the other hand help to build hypotheses about the behaviour of the neural network being researched.

The computer application of interactive methods for differential equations with products produced by fractional order is a research area for participation in the selection process with 5 articles. The articles have been published in authoritative specialized scientific journals (all with SJR and three with impact factor). Differential equations from the reduced order of Caputo and Riemann-Liouville are studied. The combination of theoretical research with computer simulations justifies the practical applicability of the obtained results.

The third research field of Ch. Assistant Professor Dr. Kremena Stefanova is Computer implementation of algorithms for approximate methods for differential and differential equations. For participation in the selection process are presented two articles and one monograph. In these scientific works new algorithms are proposed, which are computer-implemented and applied for solving of specific problems.

Simultaneously with more theoretical scientific results, in the works of the candidate one is presented with applied scientific results. Two reports and one textbook are dedicated to the development of business software applications. The prototype of the e-learning platform is specifically timely in today's situation.

I accept the claims for scientific contributions in the presentation of scientific papers formulated by Dr. Stefanova in the Author's Reference.

5. Teaching work and participation in research projects

The teaching activity of Ch. Assistant Professor Kremena Stefanova is extremely diverse.

She has lectured in the disciplines "Publishing Systems", "Business Information Systems", "Internet Technologies", "Administration of Dynamic Web Systems", "Information Technologies on the Internet", "Mathematical word processing programs", "Data analysis and interactive reference development".

She has conducted laboratory exercises on "Introduction to Information Technology", "Information Technology in Mathematics", "Econometrics", "Publishing Systems", "Digital Image Processing", "Administration of Dynamic Web Systems".

According to the presented report, Dr. Stefanova has participated in seven research projects and two national programs.

6. Conclusion

The documents and materials submitted by Ch. Assistant Professor Dr. Kremena Vasileva Stefanova meet all the requirements of the Law for the Development of the Academic Staff in the Republic of Bulgaria (ZRASRB), the Regulations for implementation of ZRASRB and the relevant Regulations of the University of Plovdiv "Paisii Hilendarski".

The candidate in the selection process has submitted a sufficient number of scientific papers published after the materials used in the defense of ONS "Doctor".

In the works of the candidate there are original scientific and scientific-applied contributions.

After getting acquainted with the materials and scientific works presented in the selection process, analysis of their significance and the scientific and scientific-applied contributions contained in them, I give my positive assessment and recommend Ch. Assistant Professor Dr. Kremena Vasileva Stefanova to be elected Associate Professor at the Faculty of Mathematics and Informatics of Plovdiv University "Paisii Hilendarski" in the field of higher education 4. Natural sciences, mathematics and

informatics Professional field 4.6 Informatics and computer science (Algorithms and models for data analysis).

10.10.2020

Gabrovo

Signature:

/ prof. Dr. Stoyan Kapralov /