

## REVIEW

for Chief Assistant Kremena Vasileva Stefanova, PhD

in a competition for the academic position of "Associate Professor"  
by professional field 4.6 Informatics and Computer Science (Algorithms and models for  
data analysis)

**Reviewer: Acad. Ivan Petkov Popchev**

By Order No. P<sub>33</sub> - 4128 Plovdiv, 25.08.2019 of the Rector of the Plovdiv University "Paisii Hilendarski" Prof. Rumen Mladenov, PhD in connection with the announced competition for the academic position "Associate Professor" in DV 57/26.06.2020 by field of higher education 4. Natural sciences, mathematics and informatics, professional field 4.6 Informatics and computer sciences (Algorithms and models for data analysis) and report by Prof. Angel Atanasov Golev - Dean of the Faculty of Faculty of Mathematics and Informatics I am nominated as an internal member of Plovdiv University of the Scientific Panel, approved by a decision of the FC of the Faculty of Mathematics and Informatics, protocol No. 8/15.07.2020.

I was selected as a reviewer of the announced competition at a meeting of the Scientific Panel, protocol No. 1/08.09.2020.

As a reviewer, I have received all 17 documents included in the application to the Rector for admission to the competition K2-33/25.08.2020.

According to the Act of the Development of the Academic Personnel of the Republic of Bulgaria, The Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria and Additional Requirements for the Academic Position "Associate Professor" of the Faculty of Mathematics and informatics (FMI), candidates for associate professors must meet certain conditions and requirements.

Art. 24 (1) The applicants to occupy the academic position of Associate Professor must meet the following conditions:

1. to have been awarded the educational and scientific degree of Doctor which for the specialties of the regulated professions must be from the same field.

2. for minimum two years:

a) to have occupies the academic position of Assistant, Chief Assistant, or

b) to have been lecturers, including part-time, or members of a research and development team in the same or in another higher school or scientific organization, ...

3. to have presented a published monograph or equivalent publications in specialized scientific issued or ..., which do not reproduce those presented for awarding the educational and scientific degree of Doctor and for awarding of the scientific degree of Doctor of Science.

4. to meet the minimum national refinements under Art. 2b, Para. 2 and 3, respectively the requirements under Art. 2b, Para. 5.

5. to have no plagiarism proven as per the legally established order in the scientific works.

(2) The academic position of Reader shall be occupied on the basis of a competition and election.

(3) A competition for occupying the academic position of Associate Professor shall be opened, if it is possible the relevant teaching and research load to be provided, according to the relevant rules of procedure of the higher school or scientific organization.

Ch. Assistant Kremena Vasileva Stefanova, PhD **meets the requirements of Art. 24 (1).1** because she defended his dissertation on " Qualitative methods for some special types of differential equations.". Holds Diploma No. 1000042, issued on October 22, 2012.

Ch. Assistant Kremena Vasileva Stefanova, PhD **meets the requirements of Art. 24 (1).2a** because with a certificate ex. No. U-222/22.07.2020, signed by the Rector Prof. Rumén Mladenov, PhD makes sure that Kremena Vasileva Stefanova works at the University on a basic employment contract with order No. R34-423/26.09.2011 as an assistant in the Department of "Computer technologies" at the Faculty of Mathematics and Informatics and continues to work.

Ch. Assistant Kremena Vasileva Stefanova, PhD **meets the requirements of Art. 24 (1).3** as it has presented 4 publications in specialized scientific journals, which do not repeat the presented for obtaining the educational and scientific degree "Doctor".

There is a "List of all scientific papers" – 43, as well as a "List of scientific papers for participation in the competition" in the competition documents.

The brief analysis of the **19 publications submitted for participation** in the competition shows the following:

- 6 publications are **in journals with IF** (NNo. 1, 2, 7, 8, 10 and 12);
- 10 publications are **in journals with SJR** (NNo. 1, 2, 7, 8, 9, 10, 11, 12 and 13);
- 2 publications are monographs (NNo. 14 and 15);
- 1 publication is a textbook (No. 17);
- 1 publication is abstract (No. 19);
- 1 publication is **independent** (No. 19);
- 1 publication is in Bulgarian (No. 19);

The "**List of Noticed Citations**" includes **30 citations** of **11 publications**, some of which are from previous procedures.

The reviewer considers that Ch. Assistant Kremena Stefanova, PhD fulfills the requirement of Art. 24 (1) .4 as it meets the minimum national requirements under Art. 2b, para. 2 and 3, respectively to the requirements under Art. 2b, para. 5 as well as the additional requirements of FMI. **According to Art. 24 (1).5 there is no proven plagiarism in the scientific works according to the legally established order.**

In accordance with Art. 65 of The Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria there are presented "**Annotations of scientific papers and self-assessment of contributions**" in Bulgarian and English.

**The contributions** of Ch. Assistant Kremena Stefanova, PhD by accepting equal participation in collective work, can be briefly systematized as follows:

1. A discrete model of a multi-agent system of agents and a leader is proposed and limitations are obtained in the model for reaching agreements - consensus with the leader. Theoretically, sufficient conditions for local and global consensus with the leader have been obtained and computer-implemented (NNo. 1 and 2).
2. The stability of discrete impulse neural networks in models with:
  - constant delays and impulse disturbances and sufficient conditions are given for exponential stability of the zero-equilibrium point;
  - impulse with long action and constant delay, the meaning and usefulness of the definition for the equilibrium point are discussed with CAS Wolfram Mathematica;
  - permanent delays in the Hopfield type network are summarized when switching topologies at certain times and connection weights depending on time. (NNo. 3, 4, 5 and 6).
3. Iterative methods for differential equations of fractional order of Caputo and Riemann-Liouville are proposed, which with computer simulations allow to solve specific problems (NNo. 7, 8, 9, 10 and 11)
4. Algorithms for approximate methods for differential and referential equations are substantiated, which are computer-implemented with CAS Wolfram Mathematica or with the C # language (NNo. 12, 13 and 14).
5. A module for extracting LaTeX format in a distributed e-learning platform DisPEL and a prototype of an E-Learning platform (NNo. 15, 16 and 17) have been built.

"**Documents for educational work**" are presented with two references:

- auditory and extracurricular employment;
- work with students.

The reports were prepared by Ch. Assistant K. Stefanova, PhD and were signed by Prof. Asen Rakhnev, PhD- Head of the Department of Computer Technology and Prof. Angel Golev, PhD - Rector of the Faculty of Mathematics and Informatics. Briefly in these reports it is noted that Ch. Assistant Kremena Stefanova, PhD has led exercises in 8 disciplines and lectures in 9 disciplines, has prepared 7 students for participation in the student research session and 6 students for awards at the Ministry of Education and Science, is an academic mentor to 58 students in the project "Student Internships" and scientific guide of 43 graduates. The "List of developed and published teaching materials" contains 3 curricula and materials in the form of lectures and exercises and 5 disciplines of additional teaching materials.

Accordingly, "**Research and Development Papers**" are presented with two references for:

- participation in 9 research projects, incl. 2 national and
- participation in professional organizations - Union of Mathematicians in Bulgaria.

Included in "**Documents**" are:

- list of participations in 2 editorial boards, 2 program and 3 organizing committees and a scientific and technical seminar of the Scientific seminar "Differential equations and applications";

- "Official Notice" Ex. No. NAP 459/22.07.20, prepared by R. Garbova for participation in 7 faculty projects and 2 national programs.

Generalized "**scientometric image**" of ch. Assistant Kremena Vasileva Stefanova, PhD can be created based on information from world scientific bases:

- Scopus: 9 documents, 28 citations exclude self-citations, h-index - 4;
- Web of Science: 12 total publications, 39 sum of times cited without self-citations, h-index - 5;
- Scholar.google: 99 citations, h-index 7, i10 -5.
- mendeley: 40 citations, h - index - 5.

The generalized "**scientometric image**" deserves to be the subject of careful and critical self-analysis and to be a sufficient basis for **independent publication activities**.

## CONCLUSION

All requirements, conditions and criteria according to Act of the Development of the Academic Personnel of the Republic of Bulgaria, The Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria and the Additional requirements of FMI are fulfilled and I give a **definite positive conclusion** for the election of Ch. Assistant Kremena Vasileva Stefanova, PhD in a competition for the academic position of "Associate Professor" in the professional field 4.6 Informatics and Computer Science (Algorithms and models for data analysis).

**I propose that the Scientific Panel unanimously vote on a proposal to the Faculty of Mathematics and Informatics to elect Ch. Assistant Kremena Vasileva Stefanova, PhD for the academic position of "Associate Professor" in the professional field 4.6 Informatics and computer science (Algorithms and models for data analysis).**

23.09.2019 г.

Reviewer: .....

Acad. Ivan Petkov Popchev