

REVIEW

by Prof. Stanimir Nedyalkov Stoyanov, PhD
about the materials submitted for participation in the competition
for the academic position of 'Associate Professor'
at the University of Plovdiv "Paisii Hilendarski"

higher education field 4. Natural sciences, Mathematics and Informatics,
professional direction 4.6 Informatics
and Computer Science (Algorithms and Models for Data Analysis)

In the 'associate professor' application, announced in the State Gazette, issue 57 from 26.06.2020, and on the website of Plovdiv University "Paisii Hilendarski" (PU) at the Faculty of Mathematics and Informatics, as a candidate participates Assistant Professor Kremena Vasileva Stefanova, PhD, from the Faculty of Mathematics and Informatics (FMI) at the University of Plovdiv.

By order № P33-4128 of 25.08.2020 of the Rector of PU I was appointed a member of the scientific jury in an application for the academic position of 'associate professor' at PU in the higher education field 4. Natural Sciences, Mathematics and Informatics, professional direction 4.6 Informatics and Computer Sciences (Algorithms and Models for Data Analysis).

Until now, at the Faculty of Mathematics and Informatics of PU, Ass. Prof. Kremena Stefanova, PhD, has taught lecture classes and laboratory exercises in various disciplines in the Bachelor's programs such as "Publishing Systems", "Business Information Systems", "Internet Technologies", "Administration of Dynamic Web Systems", "Internet Information Technologies", "Mathematical word processing programs", "Data analysis and development of interactive reports". She has developed various training courses and electronic teaching aids. The candidate regularly participates in the commissions for conducting state exams and defending diploma theses and supports the extracurricular activities of students extremely actively. She has supervised numerous successfully defended diploma theses. In the extracurricular activities, Ass. Prof. Kremena Stefanova, PhD, manages to direct the work of students to the application of acquired knowledge in practical developments. Due to my personal impressions and the application forms, I'm convinced that the candidate is a completely accomplished and highly competent lecturer constantly striving to improve and apply new technologies in education.

The publications submitted for participation in the application can be systematized as follows: 6 articles with IF (№№ 1,2,7,8,10,12), 10 with SJR (№№ 1,2,4,7,8, 9,10,11,12,13), 2 monographs (№№ 6,14), 2 monographs based on the PhD thesis (№№ 18, 19), and 1 textbook. The total IF is 5,721 and the total SJR is 3,593. I do not accept publication № 19, which is the PhD thesis abstract.

Accepting the statements in the author's reference of the candidate and taking into account my personal observations and impressions, as well as the usually acceptable volume of a short review, I would make the following summary of the contributions of Ass. Prof. Kremena Stefanova, PhD.

Computer modeling of discrete neural networks. The results of this topic are summarized in six publications – five papers and one monograph (№№ 1,2,3,4,5,6). The issue has been studied from an interesting and original point of view. The main results in this group are related to the creation of discrete models for reaching consensus with the leader in a multiagent system and for achieving stability in discrete impulsive neural networks. The stability of the different types of discrete models of neural networks presented in the monograph (№ 6) is demonstrated by means of computer simulation.

Computer application of iterative methods for fractional differential equations. The publications in this group (№№ 7,8,9,10,11) present the results of the application of theoretically well-founded approximate methods for studying dynamic models with fractional derivatives. A computer implementation largely confirms the theoretical results. In particular, iterative methods of Caputo and Riemann-Louisville fractional differential equations have been studied.

Computer implementation of algorithms of approximate methods for differential and difference equations. The results in this topic are summarized in three publications – two articles and one monograph (№№ 12,13,14). Algorithms of approximate methods for differential and difference equations are proposed and theoretically substantiated. A computer implementation and practical applicability of the algorithms are demonstrated as well.

Development of business software applications. The candidate's results in this topic are presented in two articles and one textbook (№№ 15,16,17). A prototype of an e-learning platform has been proposed that can be used in higher education. Furthermore, a module for creating electronic textbooks in LaTeX format is presented, which is integrated in the distributed DisPeL environment. The textbook is dedicated to the processes of analysis, design, implementation and administration of business software applications.

The report shows that 50 citations of the candidate's publications were noticed – 30 of them in SCOPUS and Web of Science. I detected 3 self-citations.

Evaluation of the candidate's personal contribution. According to the application documents submitted and my personal impressions, I am convinced of the candidate's personal contribution to the results presented in the publications. I am especially impressed by the focus and consistent conduct of research in contemporary, interesting, and original topics.

Recommendations. I would like to recommend to the candidate to continue her efforts to look for applications of the solid theoretical apparatus, which she is undoubtedly knowledgeable of and has mastered.

Personal impressions. As a member of examination commissions and joint faculty projects, I have personal impressions of the candidate's activities. I am convinced that Ass. Prof. Kremena Stefanova, PhD, is a responsible and in-depth scientist, a highly competent lecturer with a strong desire to improve and apply new technologies in education. Besides, she is a successful team member that has achieved significant results in the implementation of various research and practical projects.

CONCLUSION

The documents and materials applied by Ass. Prof. Kremena Stefanova, PhD, meet all the requirements of the Law and the Regulations on the Development of Academic Staff in the Republic of Bulgaria and the relevant Regulations of the University of Plovdiv "Paisii Hilendarski". The applicant has submitted a sufficient number of scientific papers, apart from those used in the defense of her PhD thesis and her application for the position of an assistant professor. The applicant demonstrates original scientific and applied contributions, which have enjoyed international recognition, and a representative part of them are published in conference proceedings and approved scientific journals. The applicant's theoretical results have practical applicability, as some of them are directly oriented to education. The scientific and teaching qualification of Ass. Prof. Kremena Stefanova, PhD, is undoubted. The candidate's teaching and research achievements fully comply with the specific requirements of the Faculty of Mathematics and Informatics. After becoming acquainted with the materials and scientific works presented in the application and analyzing their significance and scientific, scientific-applied, and applied contributions, I find it reasonable to give my positive assessment and recommend to the Scientific Jury to propose to The Faculty Council of the Faculty of Mathematics and Informatics to elect Ass. Professor Kremena Vasileva Stefanova, PhD, for the academic position of 'Associate Professor' at the University of Plovdiv in professional direction 4.6 Informatics and Computer Science (Algorithms and models for data analysis).

14.10.2020

Reviewer:

(Prof. Stanimir Stoyanov)