OPINION

by Prof. Evdokia Nikolaeva Sotirova, PhD, University "Prof. Dr. Asen Zlatarov"- Burgas

by competition for the academic degree "Associate Professor"

of Plovdiv University "Paisii Hilendarski" by field of higher education: 4. Natural sciences, mathematics and informatics; professional direction 4.6. Informatics and Computer Sciences (Artificial Intelligence), announced in State Gazette No. 96 of 11/17/2023.

The reason for writing the opinion is Order No. RD-21-70 of 16.01.2024 of the Rector of Plovdiv University "Paisii Hilendarski", Prof. Dr. Rumen Mladenov, on determining the composition of the scientific jury and Protocol 1 of the meeting of the scientific jury, with whom I am assigned to draw up an opinion. This opinion has been prepared in accordance with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for the Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for the Development of the Academic Staff of the University of Plovdiv (PU) "Paisii Hilendarski" and the Additional Faculty Requirements of the Faculty of Mathematics and Informatics (FMI) at the PU.

I have no conflict of interest regarding the competition.

Two candidates were admitted to the competition:

1. Chief Assistant Asya Todorova Toskova, PhD

2. Chief Assistant Veneta Veselinova Tabakova-Komsalova, PhD.

1. General data about the candidate

Chief Assistant Asya Todorova Toskova, PhD was born in the city of Plovdiv in 1968. In 1990, she graduated as a bachelor of engineering physics, in 1991 as a master with the qualification „physics teacher" and, in parallel, as a master with the qualification „informatics", specialty „software technologies", all at PU „P. Hilendarski". In 2019, at the same university, he obtained an educational and scientific degree Doctor of Philosophy (PhD) in professional direction 4.6. Informatics and Computer Science, Doctoral program „Informatics" after a successfully defended dissertation on "Models for Self-Teaching and Learning in the Field of Robotics". From 2020 to the present, she is a Chief assistant in the Department of Computer Systems, FMI, PU "P. Hilendarski".

Chief Assistant Veneta Veselinova Tabakova-Komsalova PhD was born in the town of Kalofer in 1975. She graduated with a master's degree from PU "P. Hilendarski" majoring in Master of Mathematics, professional qualification mathematician and computer scientist in 1999, and in 2002 also majoring in Macroeconomics - accounting organization and technology. In 2018, at the same university, he obtained an educational and scientific degree Doctor of Philosophy (PhD) in professional direction 1.3. Pedagogy of training in..., doctoral program "Methodology of training in informatics and information technologies" after a successfully defended dissertation on the topic "Formation of algorithmic thinking among students in primary school and junior high school through training in informatics and information technologies". From 2020 to the present, she is a Chief assistant in the Department of Computer Systems, FMI, PU "P. Hilendarski".

2. Description of the presented materials

The materials and documents submitted to me for participation in the competition are in accordance with the Regulations for the development of the academic staff of PU "Paisii Hilendarski".

Chief Assistant Asya Todorova Toskova, PhD participated in the competition with **21** scientific works and **1** teaching aid, unused for the acquisition of the educational and scientific degree Doctor of Philosophy and for the occupation of the academic position chief assistant, and distributed as follows (observing the numbering from the attached "List of scientific works for participation in a competition for the academic position of "associate professor"):

- **1** independent monographic work: [1];
- **6** articles in scientific journals, of which **2** are referenced and indexed in Web of Science or Scopus (**1** in Reports of the BAS ([16]) and **1** abroad ([15]) and **4** journals in Bulgaria ([8], [13],) [14], [19]);
- **14** publications in conference proceedings, of which **11** are referenced and indexed in Web of Science or Scopus ([2]-[7], [9]-[12], [20]) and **3** from conferences in Bulgaria ([17], [18], [21]);
- **1** study aid (learning activity reference).

Inaccuracies were made in the presented "Additional Faculty Requirements Reference". e.g. there, the candidate reflected that she participated in the current competition with 28 publications.

Chief Assistant Veneta Veselinova Tabakova-Komsalova, PhD participated in the competition with **48** scientific works and **1** teaching aid, unused for the acquisition of the educational and scientific degree Doctor of Philosophy and for the occupation of the academic position chief assistant, and distributed as follows (observing the numbering from the attachments "List of works for participation in the competition"):
- **1** independent monographic work: [3.2];
- **1** monographic work in co-authorship: [3.1];
- **1** book based on a protected dissertation work: [3.3];

- **2** chapters of co-authored books: [2.29], [2.30];
- **15** articles in scientific journals, of which **12** in journals in Bulgaria and abroad ([1.1]-[1.12]) and **3** in journals referenced and indexed in Web of Science or Scopus ([1.13], [1.14], [1.15]).;
- **28** publications in conference proceedings, of which **12** from conferences in Bulgaria and abroad ([2.1], [2.2], [2.4]-[2.13]) and **16** referenced and indexed in Web of Science or Scopus ([2.3], [2.14]-[2.28]). Publication [2.3] is not correctly reflected in as a publication referenced and indexed in Web of Science or Scopus;
- **1** study aid: [4.1].

3. General characteristics of the scientific, scientific-applied activity and evaluation of the candidate's personal contribution.

Chief Assistant Asya Todorova Toskova, PhD's interests are mainly focused on machine learning and intelligent recognition. To date, there are a total of over **30** scientific works, **14** of which are indexed in the world databases Web of Science or Scopus. My check showed that it has an *h-index* of **2** excluding self-citations of all authors. She participated in **7** projects, of which: **1** international one related to the development of a multi-service cloud-based IoT operating platform for general purpose; **3** national ones (**2** of them related to intelligent plant breeding and animal breeding); **3** intra-university.

The submitted works for participation in the current competition are mainly focused on intelligent systems, intelligent agriculture, recognition of Bulgarian needlework, serious games and their use in children with SEN. The candidate has presented an independent monographic work of 106 pages dedicated to intelligent pattern recognition. According to *Group of indicators B*, the candidate has 100 points. According to *Group of indicators G*. chief assistant Asya Toskova, PhD has presented **13** publications, referenced and indexed in Web of Science or Scopus. I believe that the points of publication [13] are not reflected correctly. I report **351** points under *Group of indicators G* with a minimum requirement of **200** points. Chief assistant Asya Toskova has submitted a reference for **53** citations, of which **27** citations of **14** of her publications in articles by other authors, in publications referenced and indexed in Web of Science or Scopus. I report **216** points under *Group of indicators D* are at the minimum requirement of **50** points.

The analysis of the scientific production of the chief assistant Asya Toskova, PhD shows that machine learning-related results have been obtained on deep learning of convolutional neural networks and their application to image recognition (in particular weeds in wheat), intelligent IoT organization and management systems, and educational systems.

Currently, chief assistant Veneta Veselinova Tabakova-Komsalova, PhD has a total of **59** scientific works, **21** of which are indexed in the global databases Web of Science or Scopus. My check showed that it has an *h-index* of **3** excluding self-citations of all authors. She has actively participated in international and national conferences, has a serious and diverse scientific and scientific-applied activity. There is a serious project activity - **17** projects, of which **1** is international, related to facilitating the study of artificial intelligence by students from grades 7-12; **4**

national scientific projects, **3** of them related to intelligent plant breeding and animal breeding and **1** for knowledge modeling in the field of Bulgarian folklore, of which she was the head; **3** internal university projects; **7** projects at the Ministry of Education and Culture; **2** projects under the "Leonardo da Vinci" program.

The works presented for participation in the current competition are mainly focused on systems with artificial intelligence, introduction of artificial intelligence in secondary school, application of artificial intelligence in intelligent agriculture and animal husbandry. As a habilitation work, the candidate presents: (1) an independent monographic work of 160 pages, dedicated to algorithmic thinking and declarative thinking through the introduction of artificial intelligence in secondary schools in our country; (2) a co-authored monographic work of 288 pages devoted to classical artificial intelligence and to problems related to the representation and processing of knowledge by means of logic. Thus, according to *Group of indicators B*, chief assistant Veneta Veselinova Tabakova-Komsalova, PhD has **200** points with a minimum requirement of **100** points. According to *Group of indicators G* the candidate has presented 1 book published on the basis of a dissertation, **19** publications referenced and indexed in Web of Science or Scopus and **2** book chapters. I believe that the points of posts [1.14], [2.21], [2.22] and [2.23] are not reflected correctly. I report **516** points under *Group of indicators G* with a minimum requirement of **200** points. Chief assistant Veneta Veselinova Tabakova-Komsalova, PhD has submitted a reference for **53** citations, of which **27** citations of **10** of her publications in articles by other authors, in publications referenced and indexed in Web of Science or Scopus. The points for *Group of indicators D* are **216** with a minimum requirement of **50** points.

The analysis of the scientific production of chief assistant Veneta Veselinova Tabakova-Komsalova, PhD shows that original scientific and applied results related to knowledge presentation in intelligent systems have been obtained; knowledge-based systems and applications; artificial intelligence education in middle school with a focus on logic programming.

The total number of points achieved by chief assistant Asya Toskova, PhD is over **780**, with a requirement of 400 points, i.e. exceeds by almost 2 times the minimum national requirements for occupying the academic position "associate professor" in professional field 4.6. "Informatics and Computer Science".

The additional faculty requirements of FMI at PU have also been fulfilled.

The total number of points achieved by chief assistant Veneta Veselinova Tabakova-Komsalova, PhD is over **1000**, with a requirement of 400 points, i.e. exceeds by more than 2 times the minimum national requirements for occupying the academic position "associate professor" in professional field 4.6. "Informatics and Computer Science".

The additional faculty requirements of FMI at PU have also been fulfilled.

4. Characteristics and assessment of the candidate's teaching activity.

From the presented materials, it is clear that chief assistant Asya Todorova Toskova, PhD, has a high academic workload and a diverse range of academic and teaching activities. She has conducted training in the disciplines "Software Technology", "Introduction to Software Engineering", "Software Technology Practicum", "Java Programming", "Cognitive Robotics", "Machine Learning". She prepared a study guide on "UML modeling - software success planning", published by Plovdiv University Publishing in 2023. She supervised 1 graduate student, reviewed theses, participated in committees for state exams and in a student candidate campaign. I believe that the candidate has the necessary pedagogical experience.

Chief assistant Veneta Veselinova Tabakova-Komsalova, PhD, has conducted training in the disciplines "Artificial Intelligence", "Intelligent Systems", "Databases", "Introduction to Artificial Intelligence and Logical Prolog Programming", etc. In 2022, she co-authored a teaching aid "Guide to Artificial Intelligence", published by Plovdiv University Publishing. The manual is devoted to the basic approaches to the representation and processing of knowledge necessary for the development of intelligent systems in various fields. She has 3 defended diplomas, prepared 5 reviews of diploma theses. I believe that the candidate has a diverse pedagogical activity, which is proof of her serious professional competences and skills.

5. Recommendations

From the documents presented to me during the competition, it can be seen chief assistant Asya Todorova Toskova, PhD, is a young scientist with potential for development. I believe that her interests are in quite different directions: educational environments, pattern recognition, intelligent systems, sensor systems, cyber-physical systems. It would be good to direct his scientific research in similar scientific directions that have a single focus.

From the documents of chief assistant Veneta Veselinova Tabakova-Komsalova, PhD, I get the impression that she is an established professional in the field of teaching and application of systems with artificial intelligence and intelligent agriculture. I would recommend her to focus her efforts on more active work with young researchers and doctoral students.

6. Conclusion

Presented by Chief Assistant Asya Todorova Toskova, PhD documents fully satisfy the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for for its implementation. The number of points for the groups of scientometric indicators meets and exceeds the minimum number of points according to the requirements of Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for for its implementation, the Rules for the Development of the Academic Staff of the University of Plovdiv. The additional faculty requirements of FMI at PU are also satisfied. I believe that Chief Assistant Asya Todorova Toskova, PhD, has the necessary scientific and teaching experience and degree of readiness to occupy the academic position of "associate professor".

Presented by Chief Assistant Veneta Veselinova Tabakova-Komsalova, PhD documents fully satisfy the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for for its implementation. The number of points for the groups of scientometric indicators meets and exceeds the minimum number of points according to the requirements of Law on the Development of the Academic Staff in the Republic of Bulgaria, the Rules for for its implementation, the Rules for the Development of the Academic Staff of the University of Plovdiv. The additional faculty requirements of FMI at PU are also satisfied. I believe that Chief Assistant Veneta Veselinova Tabakova-Komsalova, PhD, has the necessary scientific and teaching experience and degree of readiness to occupy the academic position of "associate professor".

Bearing in mind the above-mentioned in terms of scientific, scientific-applied, teaching activity and the assessment of personal contribution, I consider the two candidates to be valuable and highly qualified personnel who meet the requirements for occupying the academic position of "associate professor".

Assessing objectively the scientific achievements and the teaching experience of the two candidates, I believe that the head of the position chief assistant Veneta Veselinova Tabakova-Komsalova, PhD is more suitable for the position, since her scientific developments are focused in the field of artificial intelligence and directly address the problems, with which she deals. The fact that some of her developments are related to the teaching of this field of science is also important.

I recommend to the esteemed members of the Scientific Jury to vote for the awarding of chief assistant Veneta Veselinova Tabakova-Komsalova, PhD to the academic position of "associate professor" at Plovdiv University "Paisii Hilendarski" in the field of higher education: 4. Natural sciences, mathematics and informatics; professional direction 4.6. Informatics and Computer Science (Artificial Intelligence).

28.02.2024   Prepared opinion by:.................................

Burgas   (Prof. E. Sotirova)