OPINION

by Prof. Evdokia Nikolaeva Sotirova, PhD

University "Prof. D-r Asen Zlatarov" - Burgas

on the documents submitted by

Galina Dimitrova Momcheva

A candidate for the competition of academic position "Associate Professsor"

in the professional area 4.6. „Computing and Computer Science" (Neural

Networks Architectures) initiated by Institute of Mathematics and Informatics,

Bulgarian Academy of Sciences

(announced in State Gazette, 69 (80.) / 11.08.2023)

The reason for writing the present opinion is Order No 468/10.10.2023 г. of the Director of the Institute of Mathematics and Informatics (IMI), Bulgarian Academy of Sciences (BAS) Prof. PhD P. Boivalenkov, DSc for selecting the members of the Scientific jury. The present opinion is prepared according to the Law on the Development of the Academic Staff in the Republic of Bulgaria, the regulations for its implementation and the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of IMI, BAS.

One applicant has submitted documents for participation in the announced competition: Galina Dimitrova Momcheva.

The presented set of materials and documents is in accordance with the Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of IMI, BAS for occupying the academic position of "associate professor".

1. General information about the candidate

Galina Dimitrova Momcheva was born on 26.10.1970. In 1993, she graduated with a master's degree in mathematics and informatics from Shumen University Bishop Konstantin Preslavski. After successfully defending a dissertation in 2011 on the topic "Heuristic schemes for solving problems in university courses on algorithms and data structures", she obtained an educational and scientific degree Doctor of Philosophy (PhD) in a scientific specialty 07.05.03 Methodology of training in informatics and information technologies from the Higher Attestation Commission.

It is evident from the attached documents that the candidate began her work experience as a teacher of informatics and IT at the High School of Mathematics "Dr Petar Beron", Varna (1993-2005; 2022-2023). Galina Momcheva has almost 18 years of teaching experience at Varna Free University "Chernorizets Hrabar" (VFU). In the period 2005-2012, she was successively an assistant, senior assistant and chief assistant, and from May 2012 to November 2022 she was an associate professor at 4.6. Informatics and Computer Science. From June 2013 to November 2022, she was the head of the „Informatics and Computer Sciences" department at VFU.

2. 3. General description of the scientific and applied research and assessment of the personal contribution of the applicant

A scientific interests of the Galina Dimitrova Momcheva are largely aimed at applying neural networks with their variants and architectures; biomedical image processing and analysis; automation of bioprocesses. Different types of neural networks have been used (some of them fully connected, others encapsulated), in which the separate signals in the neural structure are fully or partially transmitted.

According to the attached *Reference for the fulfillment of the minimum requirements by a candidate in the competition for the academic position of "associate professor" at IMI-BAN* Galina Dimitrova Momcheva participated in the competition with 20 papers:

- 1 monograph (habilitation work);

- 15 scientific publications, referenced and indexed in world-famous databases with scientific information (Web of Science, Scopus), 9 with JSR, 2 of them IF;

- 1 book chapter;

- 1 book, based on a protected dissertation work, for the award of the PhD degree;

- 1 textbook;

- 1 study guide.

Of particular interest to me is the monograph of Galina Momcheva, dedicated to modeling and design of architectures of different types of neural networks. The monograph is thematically divided into 4 parts: Introduction to Neural Networks, Neural Network Algorithms, Contemporary Research in Neural Networks, and Neural Network Modeling and Design. The author skillfully combines neural networks with fuzzy logic, mainly of type 1 and type 2, in which much more accurate estimates and results are obtained. Considering

that type-2 fuzzy models are much more successful under uncertainty and have proven good results in intelligent control, pattern recognition and diagnostics, I believe that exploring the possibilities of designing and evaluating neural network models and applying them to them of optimization algorithms is of high utility.

In my opinion, all publications are original and published in places related to the theme of the competition and have not been used in previous procedures.

Galina Dimitrova Momcheva participated in the competition with 19 citations of 8 of her publications in articles by other authors, published in journals, referenced and indexed in Web of Science or Scopus.

Galina Dimitrova Momcheva was the supervisor of a doctoral student of independent training in 4.6. "Informatics and Computer Sciences", doctoral program "Information Systems and Technologies, Informatics and Computer Sciences", who has successfully defended his dissertation in 2022. To participate in the competition, the candidate reports activity as a team member of 1 national project under the Operational Program "Science and Education for Smart Growth", by 1 International Education Project. She managed 1 national project under the "Scientific Research Fund" and was the head of the Bulgarian team in 1 international educational project "Erasmus Mundus".

Galina Dimitrova Momcheva fully meets the requirements in Rules on the Terms and Conditions for Acquisition of Academic Degrees and Occupation of IMI, BAS for occupying the academic position "associate professor" in professional field 4.6. Informatics and Computer Science. She has over **650** points (with a minimum requirement of **430** points).

4. General characteristics of the applicant's teaching activities.

The submitted documents contain the necessary information for evaluating the candidate's teaching and research work.

Galina Dimitrova Momcheva has a serious teaching activity at VSU. From the report presented, it is clear that her workload was much higher than required. She has taught over 15 disciplines, including Computer Vision, Data Mining, Artificial Intelligence and Cybercrime, etc. It shows very good skills for working students and doctoral students and attracting them to research activity and participation in the research teams of the scientific units. This activity is complemented by various specializations, courses, trainings.

The diverse pedagogical and project activities of Galina Dimitrova Momcheva are proof of her serious professional competences and skills. She manages to skilfully combine her serious research and scientific experience with her teaching and teaching work.

4. Critical notes and recommendations

I have no significant critical remarks about the candidate. Some inaccuracies have been made in the arrangement and layout of the materials. There are incorrect citations in the monographic work, omissions in the bibliography, etc.

5. Conclusion on the application

I give a **positive assessment** to Galina Dimitrova Momcheva's application.

Based on the above, I recommend that Galina Dimitrova Momcheva to be elected to the academic position of "Associate Professsor" in the field of higher education: 4. Natural sciences, mathematics and informatics, professional field 4.6. Informatics and Computer Science (Neural Network Architectures).

01.12.2023 г.   Signature:................................
Burgas   (Prof. Evdokia Sotirova, PhD)