

## **OPINION**

**by Prof. Daniela Ananieva Orozova, D.Sc.  
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**about a competition for acquiring the academic position of Associate Professor  
in the field of higher education: 4. Natural Sciences, Mathematics and Informatics;  
professional field 4.6. Informatics and Computer Science;  
scientific specialty “Informatics (Neural Network architectures)”,  
for the needs of the Institute of Mathematics and Informatics (IMI)  
of the Bulgarian Academy of Sciences (BAS)**

The opinion is prepared in accordance with order № 468 / 10.10.2023 of the Director of the Institute of Mathematics and Informatics (IMI) of the Bulgarian Academy of Sciences (BAS) and in conformity with the Law on the Development of the Academic Staff in the Republic of Bulgaria, the Regulations for its implementation and the Regulations and specific requirements of BAS and IMI-BAS for the acquiring of scientific degrees and appointment to academic positions.

The competition has been announced in the Bulgarian State Gazette No. 69/ 11.08.2023 (pp.216,80). The only candidate who has submitted documents for participation in the competition is **Galina Dimitrova Momcheva**.

### **1. General description of the presented materials**

As a member of the Scientific Jury in the competition, I have received the required administrative and scientific documents of the candidate in electronic form: application to the Director; professional biography; copy of a master’s degree diploma; copy of a PhD diploma; list of all publications of the candidate and list of publications for participation in the competition; summary of the original scientific contributions; abstracts of the publications for participation in the competition; copies of the publications for participation in the competition; list of all known citations of the candidate; list of citations for participation in the competition; copy of Bulgarian State Gazette No. 69/ 11.08.2023 where the competition is announced; certificate of working experience; information regarding the fulfilment of the minimal National requirements in Art. 2b, Par. 2 and Par. 3, and the requirements in Art. 2b, Par. 5 of the Law on the Development of the Academic Staff in the Republic of Bulgaria; as well as the minimum requirements for IMI-BAS; standard declaration and other documents of the applicant.

The documents presented by the candidate for participation in the competition meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and Regulations for the Conditions and Order of Acquiring of Scientific Degrees and Academic Positions of IMI-BAS.

## 2. General information about the candidate

Galina Dimitrova Momcheva worked as an associate professor of computer science (4.6. Informatics and computer science) at the Varna Free University "Chernorizets Hrabar" from 06/07/2013 to 11/14/2022 and is the head of the Computer Science Department (according to a certificate for work experience, issued by Varna Free University). This shows that the candidate meets the requirements of Art. 24, Par. 2, Sec. 2 of the Law on the Development of the Academic Staff in the Republic of Bulgaria. She is on an employment contract with the Bulgarian Academy of Sciences, Institute of Mathematics and Informatics from 1.09.2023.

The candidate received her PhD degree in the scientific specialty "Methodology of Informatics and Information Technology Education" on 02/03/2011, with a dissertation on the topic "Heuristic schemes for solving tasks in the discipline "Data Structures and Algorithms" in university courses".

The candidate Galina Momcheva is: chairperson of the Board of BioMed Varna Foundation (from 2022); co-founder and co-manager of the BioMed Varna ecosystem (since 2019); Chairman of the Board of ICT Cluster Varna (2016 - 2021); member of the management of SMB-Varna. Is able to speak both English and Russian.

## 3. Analysis of the scientific and applied scientific achievements of the candidate

Galina Dimitrova Momcheva, has presented for participation in the competition for the academic position "Associate Professor": 15 scientific publications in refereed publications and 1 monograph, 2 books and 2 textbooks/teaching aids.

All 15 scientific publications are co-authored. The presented publications at the competition can be distributed over time as follows (Appendix 7B):

Year	2019	2020	2021	2022	2023
Number	1	2	4	6	2

In monograph *Artificial Neural Networks: Modeling, Engineering, and Design* there are identified theoretical domains from life sciences and computer science. New ANN architectures using Fuzzy and dendritic approaches are proposed (Appendix 7A).

The main scientific results in the publications for the competition can be divided into the following thematic areas:

- Computer vision: studies related to the classification and evaluation of images of microscopic preparations [6], [7] and [15]. A method for generating artificial images resembling natural ones with typical problems for training neural networks [12]. Algorithms for image analysis in video frames [13].

- Artificial Intelligence (AI), Artificial neural networks: development of Fuzzy U-Net Neural Network and methodology for development of new architectures/models [1], [2] and [14]. Inclusion of artificial intelligence in digital competence for students and teachers [3] and [4].
- Business process automation and computer science education: application of techniques developed in computational biology [9], developed course on Extracting knowledge from processes Process Mining [5] and master's programs [8] and [10].

In the author reference for the results of the research activity, a detailed description of the specific contributions of the publications from the submitted list for the competition is given. The numbering follows the reference for scientific publications (Appendix 7B).

Undoubtedly, the topic of the candidate's scientific works is of high relevance.

#### **4. Impact of the candidate's results on the publications of other researchers**

According to the presented materials regarding citations, Galina Momcheva has presented **19 citations** for participation in the competition for acquiring the academic position of "Associate Professor".

According to the documents submitted, the candidate receives: 50 points in group of indicators A; 100 points in group of indicators B; 225 points in group of indicators Γ; 111 points in group of indicators Δ; 337 points in group of indicators E. Therefore, the minimal national requirements and the additional requirements in Art. 1a, Par. 2 and Par. 3 of the Regulations for Implementation of the Law on the Development of the Academic Staff in the Republic of Bulgaria for the acquiring of the academic position "Associate Professor" in professional field 4.6. Informatics and Computer Science are fulfilled.

#### **5. Critical remarks and recommendations**

I have no personal impressions on the work of the candidate. From the submitted documents, I draw a conclusion that he is an established researcher.

I also assume that the contributions of the candidate in the presented publications is equal to the contributions of his co-authors.

#### **6. CONCLUSION**

After acquainting myself with the presented materials and scientific publications for the competition and on the basis of an analysis of their significance and the scientific and applied scientific contributions included in them, I confirm that the scientific contributions meet the requirements of the Law on the Development of the Academic Staff in the Republic of Bulgaria and the Regulations for the Conditions and Order of Acquiring of Scientific

Degrees and Academic Positions of IMI-BAS for the appointment of the candidate to the academic position “Associate Professor” in the scientific area and the professional field of the competition.

I give my **positive evaluation** of the candidature of **Galina Dimitrova Momcheva**. Based on the above said, I recommend to the Scientific Jury to propose to the competent appointment authority of IMI-BAS to appoint Galina Dimitrova Momcheva to the academic position “Associate Professor” in professional field 4.6 Informatics and Computer Science (Neural Network architectures).

December 7, 2023.  
Burgas

**Member of the Scientific Jury:** .....  
/Prof. Daniela Orozova, D.Sc./