

OPINION
for a competition for acquiring academic position "professor"

in the field of higher education:	4. Natural sciences, Mathematics, and Informatics
professional field:	4.6. Informatics and Computer Science
scientific specialty:	Informatics (Modern technologies for preservation, accessibility and protection of scientific, and cultural heritage)
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for the needs of:	Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences (IMI-BAS) Software Technologies and Information Systems Department
prepared by:	Dr. Krassimira Minkova Ivanova, Associate Professor at IMI-BAS
member of the scientific jury of the competition, according to:	Order № 11 / 29.01.2021 of the Director of IMI-BAS

Only one candidate has submitted documents for participation in the announced competition:

Assoc. Prof. Dr. Galina Todorova Bogdanova, IMI – BAS.

I. General description of the submitted materials

1. Details of the application

For participating in the competition, Assoc. Prof. Dr. Galina Bogdanova has submitted 25 publications. These publications are not used for obtaining the educational and scientific degree "Doctor" and for holding the academic position "Associate Professor" and are in the subject of the competition. In particular, their distribution by categories is:

- 2 publications with impact factor (1 in category Q2 and 1 in category Q3 in WoS);
- 9 publications with impact rank (Scopus);
- 12 publications that are only indexed in Scopus or WoS;
- 2 book chapters.

Also, a Handbook on web accessibility and an online questionnaire (2016) and a Report from a survey of the accessibility of 100 websites of public institutions in Bulgaria (2016) related to the issues of the competition are attached.

A list of 281 citations of 59 publications is presented (without self-citations) derived from the system SONIX, as well as a general list of citations derived from Scopus. From the second list Galina Bogdanova has selected 44 citations for participation in the competition. My remark is that there is an inconsistency between these 44 citations and the citations showed in the Table for covering minimum requirements of IMI-BAS (where the only subset of these citations is shown).

The profile of Galina Bogdanova in Scopus shows H-index 7. If we take into account the presented general list of citations (from SONIX), her H-index is 10.

Also, there are presented:

- list of defended doctoral students (4 people);
- list of participation in research projects. The attached list is incomplete and inaccurate, but there is a list of participations in research projects in the Table for covering minimum requirements of IMI, where 18 projects are listed: 17 are research projects (national projects: team member – 10, international projects: team member – 3, head of the team – 4) and 1 is for supporting an international event, because of this is ignored for reviewing;
- list of participation in the editorial boards in volumes of a scientific series, thematic collections or proceedings of scientific forums (editor-in-chief – 11; member of editorial board – 1; technical editor – 1);
- list of participation in the creation of digital scientific collections and museum collections (team leader – 4; team member – 2);
- list of participation in the creation of online platforms and software modules (7);
- list of lectures, special courses, seminars, and schools (topics: cultural and historical heritage and web accessibility);
- list of participation in the organization of exhibitions in Bulgaria (25) and abroad (1);
- list of membership in organizing and program committees of scientific forums (53 events; international forums: OC chairman – 7, OC member – 11; national forums: PC chairman – 10, OC chairman – 7, PC member – 6, OC member – 12);
- list of awards "best article in a scientific forum" (2);
- list of participation in councils, commissions, and other expert bodies of institutions external to BAS;
- list of expert reports, consultations, and opinions.

2. A short CV

Galina Bogdanova has two master's degrees from the Technical University – Sofia: specialty "Heat Energy and Nuclear Energy" and "Applied Mathematics".

In the period 1996-2000, she was a doctoral student at IMI-BAS and in 2000 she successfully defended the doctoral dissertation "Limits for optimal codes" with supervisor Prof. Stoyan Kapralov. From 1981 to 1988 she worked as a programmer at the Territorial Computing Center, Veliko Tarnovo, and since 1989 she has been working at IMI-BAS, V. Tarnovo branch, successively as a mathematician, research associate, and since 2002 – as an Associate Professor.

Galina Bogdanova's main research interests are in the fields of coding, information protection, databases, data analysis, semantic technologies, ontologies, digitization of cultural and historical heritage, web accessibility technologies, and so on.

The presented lists of additional activities reveal the diverse active and successful activity of Galina Bogdanova as an organizer, expert, lecturer, head of doctoral students, member or leader of project teams.

3. General characteristics of the scientific works and achievements of the candidate

Galina Bogdanova's research work can be categorized in the following areas:

- coding and protection of information – theoretical aspects (construction and classification of linear, nonlinear, and optimal codes with certain properties), and practical aspects (watermark protection schemes);
- modern methods and technologies for preservation, digitization and presentation of scientific and cultural heritage (application of integrated approaches for organization and protection of data in specialized digital archives of artifacts and creation, organization, management, and presentation of digital archives and repositories);
- adaptation of the developed methodologies and integrated approaches to other applied areas (such as healthcare, training, etc.);
- approaches, methods, and standards for ensuring digital accessibility for people with special needs (development of methodology and analysis of web accessibility on public sites and electronic textbooks).

The scientific papers, presented at the competition, contain original authors' results, and the references to non-authors texts are well marked. I.e., there is no plagiarism.

Regarding the fulfillment of the minimum requirements for the academic position "Professor" at IMI-BAS, Galina Bogdanova fulfills or significantly exceeds the criteria by groups:

- group A: defended doctoral dissertation "Limits for optimal codes" in 2000 – 50 points;
- group B: 5 publications with SJR – 100 points;
- Group G: 20 publications (1 in category Q2 in WoS, 1 in category Q3 in WoS, 4 with SJR, 12 indexed, 2 book chapters) – a total of 342 points with a required 220 points;
- group D: 44 citations are presented in Scopus – 264 points with a required 140 points;
- group E: 4 protected doctoral students, 10 participations in national, 3 participations in international, 4 leaderships of national research projects (1 of the mentioned projects is not a research project) – 440 points at required 150 points.

The requirement for the presence of at least 10 publications in editions with IF or SJR (art. 3, para. 1, item 3 of Regulations for the Conditions and Order for Acquiring of Scientific Degrees and Academic Positions of IMI-BAS) is also satisfied – Galina Bogdanova has presented 11 such publications.

4. Evaluation of work on projects and other activities

As can be seen from the reference above, Galina Bogdanova has participated in many successful research projects, some of which she is the team leader. I should also mention her active work in

promoting the results by organizing a number of exhibitions, museum collections, as well as organizing scientific events. Her merit is the establishment of the series "Cultural and Historical Heritage: Preservation, Presentation, Digitization" and the interdisciplinary seminar "Information Society", around which a research network is built with participants from over 20 universities, institutes, libraries, museums, and others. She has ability to guide young people in the early stages of their scientific careers, as evidenced by the four successfully defended doctoral students.

5. Content analysis of the scientific and applied research of the candidate, contained in the materials for participation in the competition

The nature of the scientific papers submitted at the competition can be classified as follows:

- *coding and protection of information* – development of new methods for construction and classification of codes with certain properties ([6], [21], [22]), development of algorithms and software system for implementation of the methods ([18]), analysis of existing ([2]), proposing improved methods for image and text protection ([20]) and their practical application in digital collections ([19], [25]);
- *digitization and presentation of scientific and cultural heritage* – analysis and design of methods and tools for organization and protection of data in specialized digital archives of artifacts [4], [5], [7], [10], [17], [19], [23]);
- *other areas of application* – adaptation of developed methodologies and integrated approaches toward the applied area: healthcare ([3], [12]) and training ([16]);
- *approaches, methods, and standards for ensuring accessibility and training for people with special needs* – creation of a methodology for building sites that meet the conditions for web accessibility ([8], [16]), analysis of problems and solutions for providing access to digital resources from the cultural heritage ([15], [24]), analysis of web accessibility on public sites ([1]), research on the problems with the accessibility of software environments, teaching materials, serious educational games, etc. ([9], [11], [13], [14]). The main contribution of Galina Bogdanova in this direction is planning, organizing, and coordinating the work on the implementation of the tasks.

The publications of Galina Bogdanova are collective, in most cases the authors' team includes her doctoral students, which shows the continuity of the ideas. Although there are no special separation protocols for the publications, the significant participation of Galina Bogdanova in achieving the presented results is not in doubt, as far as the articles are in the profile of her scientific interests and ideas, adequately reflected in her other activities – participation in research projects, promotional activities, expert activity.

Galina Bogdanova's work is recognized by the scientific community at home and abroad. She has good collaborations with colleagues abroad (two of the works she is applying for are with foreign co-authors), and especially the works in the field of coding theory have many citations from various scientific communities around the world.

6. Critical remarks and recommendations

My recommendation is for a little more organization and prioritization of tasks. Galina Bogdanova is a person with multifaceted interests and opportunities, but some channeling of creative energy would lead to even better results.

In particular, the submitted application documents contain a rich description of its various activities, but there are inaccuracies and discrepancies between the submissions in the various documents. The statement of compliance with the minimum requirements should be edited.

7. Personal impressions of the candidate

I know Galina Bogdanova as an extremely active person with various scientific interests, who knows how to work in a team, with good organizational qualities. She has original ideas and she has the talent to attract young people to deal with scientific work. Currently, she is the team leader of the NSF project "Digital Accessibility for People with Special Needs: Methodology, Conceptual Models and Innovative Ecosystems" (No. KP-06-PN 42/4 of 08.12.2020), in which participates also colleagues from our section "Software technologies and information systems". I believe that her election as a professor would have a positive effect on increasing the efficiency of work in the section and hence enriching the overall performance of the Institute.

8. Conclusion for this application

The scientific achievements of Galina Bogdanova meet the requirements of the Law for development of the academic personnel of the Republic of Bulgaria and the Regulations on it, the Regulations for the conditions and the procedure for acquiring scientific degrees and for occupying academic positions at the Bulgarian Academy of Sciences and the specific regulations for the IMI-BAS.

In particular, the candidate satisfies the minimum national requirements in the professional field and no plagiarism has been established in the scientific papers submitted at the competition.

I give my positive assessment of the candidacy.

II. Overall conclusion

After getting acquainted with the scientific papers and materials presented in the competition, analysis of their significance, and the scientific and applied contributions contained in them, I find it reasonable to give my **positive assessment** and I recommend the Scientific Jury to vote on a proposal to the Scientific Council of IMI-BAS to select Assoc. Prof. Dr. Galina Todorova Bogdanova to take the academic position of "**Professor**" in the field of higher education 4. Natural Sciences, Mathematics, and Informatics, professional field 4.6. Informatics and Computer Sciences, scientific specialty Informatics (Modern technologies for preservation, accessibility and protection of scientific, and cultural heritage).

25.02.2021

Sofia

Signature:

(Assoc. Prof., PhD Krassimira Ivanova)