REVIEW

from Prof. Dr. Eliza Stefanova Stefanova,
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for the competition in the scientific field: 4. Natural Sciences, Mathematics and Informatics, processional field: 4.6. Informatics and Computer Sciences, Specialty: Informatics (Systems, methods and tools for presentation and management of digital cultural and educational resources) for academic position of "Associate Professor" at the Laboratory of Telematics, (LoT) Bulgarian Academy of Sciences (BAS)

I was appointed as a member of the scientific jury for the competition, announced in the State Gasette №22/18.03.2022, according to the order №110/17.05.2022 г. of the Director of the Institute of Mathematics and Informatics (IMI) at BAS.

Assistant Prof. Dr. Lilia Radoslavova Pavlova from LoT, BAS, is the only candidate in this competition.

1. General description of the candidate and the presented materials

The candidate presented the following materials for the participation in the competition: application for participation in competition, professional CV in European format, diploma for obtaining the Master's degree, diploma for achieving a PhD in computer science, general list with all publications so far, list with publications for the participation in the competition, short description of scientific achievements of the candidate in the publications presented for the competition, resumes of all publications presented for the competition in Bulgarian and in English languages, copies of all the publications presented for the competition, general list with all citations of the candidate's publications, list with citations of publications presented for the competition, copy of the State Gazette with the announcement of the competition, official document for working experience, description of other relevant activities (scientific, applied and teaching activities), description of achievements for all national

quantitative requirements, medical certificate, certificate of conviction, and two more declarations.

The candidate has more than 10 years working experience as Chief Assistant Professor in Informatics at LoT – BAS. She also has experience as Chief Assistant Professor in Informatics at New Bulgarian University.

Chief Assistant Professor Lilia Radoslavova Pavlova is holding a PhD degree from IMI-BAS.

She presented 27 scientific publications for the participation in the competition. Ten of these publications have Impact Factor (IF) and/or impact rang (IR), while another fifteen are indexed in the Web of Science, Scopus and/or ACM Digital Library. Two scientific publications are chapters from books, five are in scientific journals and 20 are published in proceedings of international scientific conferences.

Chief Assistant Professor Dr. Lilia Radoslavova Pavlova presented general list with 70 scientific publications. Fourteen of them are published in journals with IF and/or IR, while 40 are indexed in Web of Science and/or Scopus. 69 scientific publications are in English language, and one is published in Bulgarian language. Twelve scientific publications are in journals, 56 are published in conference proceedings (54 in international conferences).

2. General characteristics of the candidate's scientific works

The candidate classifies her publications presented for the competition in the following scientific areas:

A. Digital cultural content management systems and applications

1. Methods and tools for creating, presenting and using content in digital libraries. Digital cultural ecosystems - publications 4, 6, 10, 16, 19, 22, 23;

2. Methods and tools for analysis and extraction of knowledge from data - publications 1, 3;

3. Digital reconstruction of cultural and historical assets - publications 13, 14, 15, 17, 18.

Б. Advanced information technologies in education

1. Development and applications of serious games, digital theatre and storytelling in education - publications 2, 5, 7, 8, 9, 11, 12, 20, 21, 24, 25, 26, 27.

All publication numbers follow the list of publications for the competition, given in the document with the same name.

Chief Assistant Professor Lilia Radoslavova Pavlova is fulfilling all the quantitative requirements for acquiring the academic position of Associate Professor. In more details, her quantitative measures are as follow:

- 124 points in group C (the minimal requirement is 100);
- 282 points in group G (the minimal requirement is 220);
- 102 points in group D (the minimal requirement is 70);
- 50 points in group E (the minimal requirement is 20).

The candidate is satisfying also the additional requirement from IMI – BAS to have at least five scientific publications with IF and/or IR (she has ten such publications).

There is no confirmed case of plagiarism related to the scientific publications of the candidate, submitted for the competition.

3. Analysis of the applicant's scientific and applied achievements presented in the competition materials

In the "Digital Cultural Content Management Systems and Applications" area, we would like to mention the intelligent data curation method implemented in a digital library, as well as the algorithm created to prevent duplicate records for digital objects

(publication 4). Of undeniable interest is the innovative approach to improve user experience in a digital library by implementing data and knowledge analysis and synthesis services (publication 6). In publication 19 the technological integration between the digital library "Virtual Encyclopedia of Bulgarian Iconography", the panoramic photo viewer and the mobile application - tourist guide BOOK@HAND BIDL is presented. The main contribution in publication 22 is the developed architecture and functional components, providing technological solutions and tools for unifying the processes of access, preservation and use of cultural and historical content in accordance with established best practices and regulations in the field.

In publications 1 and 3, methods and tools for analysis and knowledge extraction from data are basically presented. Publication 1 presents an ontology of a learning method "analysis" to enable the analysis of a selected subject area for learning purposes. The development was used in the SINUS project of the National Research Institute for the analysis of the content and objects of the field "Eastern Orthodox iconographic art", stored in a multimedia digital library "Virtual Encyclopedia of Bulgarian Iconography". The main contribution in publication 3 is the developed formal model for monitoring and management of processes for collection, processing and analysis of large volumes of data (Big data). Optimization algorithms for knowledge extraction from data and prediction of future results are applied, based on approximation methods widely used for recommender systems.

The contributions in publication 23 relate to the development of models for the effective use, ongoing development, exploration and delivery of digital cultural resources in digital cultural ecosystems for learning purposes, following the vision, best practices and achievements of the DARIAH Research e-Infrastructure for Culture and Humanities.

Of interest is the interdisciplinary approach to digital reconstruction of cultural and historical assets, shown in publications 13, 14, and 15. In publication 13 the digital reconstruction of the Cathedral of Ss. Maria Assunta in Torcello, Venice, Italy, is presented using available digitized documents and archival units. In publication 14,

methods are presented for the digital reconstruction of the hidden images of the icon of Our Lady of Nicopea, the Famous Palladium of Venice. The Icon of Our Lady of Nicopea, kept in the Basilica of San Marco since 1968, has been the subject of laboratory studies and technological analyses proving the existence of several superimposed images of the Virgin differing from the image known today. The visualization of the results and the evaluation of various working hypotheses are supported by imaging and post-processing techniques encompassing both digitization and optimization of old analog photographs and image processing methods. The main contribution of publication 15 is the digital reconstruction of the carving of the burnt iconostasis of the Church of the Assumption in Bansko in its original form based on a single surviving photograph.

In the area of "Modern Information Technologies in Learning", we will note as a contribution the proposed method of technology-supported learning, which combines learning analysis, group work, mobile learning (m-learning), discussions and learning by doing in order to achieve a more active participation of learners during the acquisition of knowledge and the stimulation of creative thinking (publication 20). The development of serious games with applications in learning are among the priorities of European Union research programmes. In publications 2, 5, 7 and 9 several developments of serious educational games using techniques such as storytelling are presented. An experimentally developed game application is presented - the serious game "Thracians", a virtual 360-degree panoramic environment including elements of the life, beliefs and traditions of the ancient Thracians. Of interest is the model for semantic-based linking of digital multimedia resources from the field of Thracian history and culture into the game. An educational approach to the study of ancient history and civilizations is proposed. In this regard, the development of the serious game "Aquae Calidae" is of scientific and applied interest, aiming at a positive impact on education, social cohesion and preservation of national memory in the adolescent generation.

4. Works as a lecturer, project works and other activities

The candidate has significant experience as lecturer in various Bulgarian Universities. She is participating in the teaching of eight distinct disciplines at the New Bulgarian University, department of Informatics, in the period 2017-2019, as chief assistant professor. She is also participating in the teaching of three disciplines at the Bourgas Free University, department of Informatics, in the period 1995-1999, as a honorary assistant professor. She worked also as honorary assistant professor at the National Academy of Arts, faculty of Fine Arts, in the period 2006-2015.

The Chief Assistant Professor Lilia Radoslavova Pavlova has participated in seventeen national and international research projects funded by the National Research Fund, the Ministry of Education and Science, Scientific programmes of the European Union, etc. In most of these projects she actively participated in the development of important research results, which later on were reported in most of her scientific publications or presented in international conferences.

5. Critical comments and recommendations

I don't have any specific critical remarks to the scientific publications of the candidate.

I recommend to the Chief Assistant Professor Lilia Radoslavova Pavlova to participate in more challenging and prestigious international research projects and collaborations with leading world researchers, as a best road to achieve excellence and world recognition for her research efforts.

6. Conclusions

After the analysis of the publications presented for the competiton, **I confirm that the scientific achievements of Chief Assist. Prof. Dr. Lilia Radoslavova Pavlova meet all the requirements of** the Act of the Development of the Academic Personnel

of the Republic of Bulgaria (ADAPRB), the Rules for the Implementation of the Act of the Development of the Academic Personnel of the Republic of Bulgaria (RIADAPRB), the Rules for the conditions and the order for acquiring scientific degrees and for occupying academic positions in BAS and the specific regulations for the IMI and LoT – BAS.

No plagiarism was detected in the scientific papers submitted for the competition.

I give positive assessment of the application of the candidate.

I recommend to the scientific jury to vote on a proposal to the Scientific Council of IMI-BAS to select Assist. Prof. Dr. Lilia Radoslavova Pavlova for taking 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 (Systems, methods and tools for presentation and management of digital cultural and educational resources).

16.07.2022   **Reviewer:**

                                                Prof. Dr. Eliza Stefanova