OPINION

by Prof. Evdokia Nikolaeva Sotirova, PhD

University "Prof. Dr. Asen Zlatarov"- Burgas

of a dissertation for awarding the educational and Doctor of Philosophy (PhD)

in the field of higher education: 4. Natural Sciences, Mathematics and Informatics;

Professional field 4.6. "Informatics and Computer Science",
PhD Program "Informatics"

PhD student: Sebiha Ahmedova Madanska

Topic: Semantic modelling of the bulgarian cultural and historical heritage

Scientific supervisor: Prof. Stanimir Nedyalkov Stoyanov, PhD

1. General presentation of the procedure and PhD student

The opinion was drawn up on the basis of order No. RD-21-200/26.01.2023 of the Plovdiv University „Paisii Hilendarski" Prof. Rumen Mladenov, PhD and Protocol 1 of the meeting of the Scientific Jury with which I was assigned to prepare an opinion, with which I am designated as a member of the scientific jury and to prepare an opinion on the procedure for the defense of a dissertation on a topic „Semantic modelling of the bulgarian cultural and historical heritage" with author Sebiha Ahmedova Madanska, for the acquisition of an educational and scientific degree "PhD" in the field of higher education 4. Natural sciences, mathematics and informatics, Professional field 4.6. Informatics and Computer Science, Doctoral Program "Informatics" at the Department of "Computer Systems".

The materials presented by Sebiha Ahmedova Madanska materials are in accordance with the Regulations for the Development of the Academic Staff of Plovdiv University "Paisii Hilendarski".

Sebiha Ahmedova Madanska was born on 09.03.1994. She completed her secondary education at "Otec Paisii" Secondary School, Madan, in May 2013. In July 2017, she graduated as a "Bachelor" in "Information Technologies, Mathematics and Educational Management" at the University of Plovdiv „Paisii Hilendarski". She graduated with a master's degree in September 2017 with specialty Software technologies with specialization in systems with artificial intelligence" at the same university. In March 2019, she was enrolled in full-time doctoral studies in the doctoral program "Informatics" at the Plovdiv University „Paisii Hilendarski". The

PhD student's teaching experience began in September 2019 as an honorary assistant, and from November 2022 until now she is an assistant in "Databases" at Plovdiv University „Paisii Hilendarski". On 09.12.2022, Sebiha Madanska was dismissed with the right to defend her PhD Thesis.

2. General assessment of the dissertation research

Actuality of the topic

The PhD thesis is dedicated to an extremely interesting field - digitization of the cultural-historical heritage (CHH) with a main emphasis on the houses from and around the Renaissance period. The topic is in tune with the modern information society, characterized by real-time exchange of information and cultural communication. The construction of a unified ontological model and its subsequent integration into a network of ontologies for CHH is of high level of work applicability.

Knowing the problem

Sebiha Ahmedova Madanska demonstrates competence and very good knowledge of the issues related to the research area. The PhD student has a marked interest in the problem area, considering her graduation thesis on the topic "Development of an ontology for old Rhodope houses". The professional experience of the doctoral student is the basis for the competent realization of the goal set in the dissertation, formulating and evaluating the problems, presenting and justifying the research, analysis and obtained results.

Research methodology

I find the methodology used by the PhD student to achieve the formulated goal and the tasks corresponding to it expedient, convincingly motivated and suitable for the successful implementation of the research, which is evident from the results obtained.

Characterization and evaluation of the dissertation work

The PhD thesis of Sebiha Ahmedova Madanska contains 158 pages. It consists of a list of figures, a list of tables, an introduction, four chapters, a conclusion, contributions to projects, a complete list of the author's publications, acknowledgments and a bibliography. The bibliography contains 277 literary sources, of which 211 are in English, 66 in Bulgarian.

The purpose of the development „building a unified ontological model with standardized data based on semantic representation for its subsequent integration into a network of ontologies for CHH under the name Cultural and Historical Heritage Ontology Network (CHH-OntoNet) and use for the purposes of an intelligent tourist guide" is stated in the introduction of the scientific work and four main tasks for its achievement are defined. An in-depth and competent analysis of the current state of the subject of the study was made. I find very useful the presented ontologies in the field of CHH and specifics in the semantic modeling of CHH (revival housing architecture). An approach to semantic modeling was chosen, according to the specifics and the applied standard, a formal semantic model was developed, allowing the presentation of the char-

acteristics of residential architecture in the period of and around the Bulgarian Renaissance. Through the Protégé environment, seven ontologies have been developed: Objects, Materials, Subjects, Agents, Locations, Functionalities, OldHouses. Following the set goal, ontologies are integrated into one and opportunities for their application are presented. On page 138, the achieved results, the tasks, the place of description in the PhD thesis and the realized publications are reflected in a tabular form.

The PhD thesis is well structured and carefully developed. The critical analysis of the problem area shows the good awareness of the PhD student. I believe that the research was done correctly and the defined tasks were followed. The presentation is comprehensive, very well argued and adequately illustrated.

3. Assessment of the publications and personal contribution of the PhD student

According to the documents presented by Sebiha Ahmedova Madanska, results of her dissertation work were reported at five international scientific conferences (four specialized on the subject in Bulgaria and one abroad). For the present procedure, the PhD student presents four publications in proceedings of these conferences, three of which are indexed in Scopus and in Web of Science ([1, 2, 4]). Two of the publications are independent, in one the PhD student is the first author. The personal contribution of the PhD student is visible. All publications are entirely on the subject of the dissertation.

The publications present the results of the research done sufficiently fully. I highly appreciate the work of the PhD student, especially considering that this is the first study of its kind.

4. Contributions and significance of the development

I believe that the contributions in Sebiha Ahmedova Madanska PhD thesis are scientific-but-applied and applied, and I summarize them as follows:

1) A prototype model of ontologies for the problem area was designed according to defined criteria;
2) Seven ontologies have been implemented and successfully tested;
3) A unified ontological model was built with standardized data based on semantic representation.

The possibilities and ideas for future applications presented by the PhD student support the significance of the development.

The obtained scientific-applied and applied results are original. They fully correspond to the goal set in the dissertation work.

5. Abstract of PhD thesis

The abstract of PhD thesis contains 32 pages. It is well structured and correctly and fully reflects the structure of the dissertation work, the results obtained and the conclusions drawn from the study

6. Critical remarks and recommendations

I have no critical remarks about the doctoral student. I recommend that he continue the research he has started and follow the future research presented on 140 pages.

7. Conclusion

My assessment of Sebiha Ahmedova Madanska PhD thesis, abstract, publications and scientific activity is entirely positive. The PhD thesis contains scientific-applied and applied results, which represent an original contribution to science and show that the doctoral student has in-depth theoretical training, opportunities for critical analysis and independent conduct of scientific research.

The PhD thesis fully meets the requirements of the Law on the Development of the Academic Staff of the Republic of Bulgaria, the Regulations for its implementation, as well as the criteria of the Regulations for the specific conditions for acquiring scientific degrees and for occupying academic positions in the Institute of Information and Communication Technologies.

The dissertation fully meets the requirements of the Law on the Development of the Academic Staff of the Republic of Belarus, the Rules for its Implementation, as well as the criteria of the Rules for the Development of the Academic Staff at Plovdiv University "Paisii Hilendarski" and the specific requirements of the Faculty of Mathematics and Informatics have been observed.

This gives me a reason to confidently recommend to the respected members of the Scientific Jury to award Sebiha Ahmedova Madanska the educational and scientific degree "PhD" in professional field 4.6 "Informatics and computer sciences", PhD program "Informatics".

27.02.2023   Prepared the opinion:.................................

Burgas   (Prof. E. Sotirova)