

# OPINION

by Assoc. Prof. Irina Alexandrovna Radeva, PhD - Institute of Information and Communication Technologies - BAS

on dissertation for the award of the educational and scientific degree "Doctor"

in the area of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and Computer Science,

Doctoral Programme "Informatics"

**Author: Eng. Maria Todorova Grancharova-Christova**

**Title: "Research for the creation of semantic models in the humanities"**

**Scientific supervisors: prof. Asya Georgieva Stoyanova-Doycheva, PhD and prof. Todorka Atanasova Glushkova, PhD**

By Order No.RD-21-2231/ 27.11.2023 of the Rector of Plovdiv University "Paisii Hilendarski" (PU) Prof. Rumen Mladenov, PhD to provide a procedure for the defense of a dissertation thesis titled "Research for the creation of semantic models in the field of humanities" for the acquisition of the educational and scientific degree "Doctor" in the area of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6. Informatics and Computer Science, Doctoral Program Informatics, Report No.RD-20-2022/23.11.2023 by Prof. Angel Atanasov Golev, PhD - Dean of the Faculty of Mathematics and Informatics and in accordance with Art. 4. of the ASDARB, Art 2.(2), Art. 30.(3) of the RIASDARB, and Art. 37.(1) of the RDASPU, I have been appointed a member of the scientific jury.

As a member of the scientific jury, I have received:

- a standard application to the Rector of PU for opening the procedure;
- CV in European format;
- minutes of the preliminary discussion in the Department;
- dissertation;
- abstracts in Bulgarian and English;
- declaration of originality and authenticity of the attached documents;
- a statement of compliance with the minimum national requirements;
- list of publications;
- dissertation;
- copies of publications on the subject of the dissertation;
- memo No. RD-26-193/06/11/2023 for participation in projects by the HHS "St. St. Cyril and Methodius"
- opinions of the scientific supervisors.

The dissertation is 201 pages and includes: introduction, five chapters, conclusion, main tasks solved in the dissertation research, results, future development, approbations, reports of scientific conferences, declaration of originality of the results, publications on the

dissertation, full list of publications of the author, list of citations, list of abbreviations, bibliography of 162 references, 1 appendix, 167 figures and 12 tables.

The aim of the dissertation is formulated as "... to conduct a study on semantic models that find application in the humanities."

In order to achieve the aim, four tasks are formulated:

Task 1: Creation of a semantic model in the form of an ontology in the field of humanities.

Task 2: Creation of algorithms for the automatic generation of questions from the ontology in Bulgarian language.

Task 3: Creation of an application that uses predefined configurational structures to create the ontology and insert information into it.

Task 4: Creation of an application that is used for extracting information from the ontology based on different algorithms.

The dissertation is addressed to a topical issue with well-defined tasks. Particularly remarkable is the interdisciplinary nature of the research as it promotes the fusion of information technology and the humanities. The development of semantic models, in particular ontologies, is relevant to the advancement of semantic technologies that impact areas such as information retrieval, data mining and knowledge management. The focus on Bulgarian for automatic question generation is a valuable contribution to poorly represented languages in the digital context.

The thesis demonstrates an understanding of the current state of research in the field and shows that the PhD student has researched and interpreted the relevant literature and incorporated it into the development of solutions and applications, such as the creation of algorithms for automatic question generation in Bulgarian and applications for ontology creation and information extraction. The structure of the dissertation reflects a well thought out approach to the integration of semantic models in the humanities. The content reflects a commitment to current research and the application of creativity to address gaps in the field. It demonstrates a good knowledge of the existing literature and an ability to apply this knowledge to research.

The results presented in this dissertation can be briefly systematized as follows:

1. Scientific contributions:

- Development of a semantic model in the form of an ontology adapted to the humanities.

- Creation of algorithms for automatic generation of questions in Bulgarian based on the ontology.

2. Scientific and applied contributions:

- Design and development of an application for ontology creation and completion using predefined configuration structures.

- Development of an application to extract information from the ontology using different algorithms.

3. Applied contributions:

- Practical implementation of the developed ontology and algorithms in the form of "OnthologyGenerator" and OnthologyReader" applications, facilitating tasks such as information generation and extraction in the humanities.

These results are a combination of theoretical and practical advances in semantic models, algorithms and application development in the context of the humanities. The work extends the application of semantic models to poorly represented languages such as Bulgarian and provides tools for practical application in education and other research.

**I accept that the results are consistent with the scope and content of the aims and tasks** and have potential for further development. The PhD student has demonstrated the necessary theoretical and practical knowledge of the field, has developed skills and gained experience to conduct independent research.

**6 publications** have been submitted on the dissertation, including **2 in the proceedings of international conferences, 1 in the proceedings of a national scientific conference with international participation, 3 in international journals. 2 publications are refereed and indexed in Scopus.** All publications are co-authored, 5 are in English and 1 is in Bulgarian and are for the period 2021 - 2022.

The publications on the dissertation show that the stages in the dissertation work and the main obtained results have been presented to the scientific community.

The points submitted according to the requirements for the educational and scientific degree "Doctor" in Group D are 36 points with a minimum requirement of 30 points, thus fulfilling the conditions of the RIASDARB and RDASPU.

There is 1 noted citation presented in this dissertation.

**I am confident** in the personal involvement of the doctoral student in the dissertation research, and that the contributions formulated and results obtained are her personal merit.

The abstract is 32 pages in Bulgarian and 31 pages in English, and presents the dissertation work.

**I have no evidence of plagiarism** or unreliability of the scientific data presented in the dissertation.

As a critical remark, it can be pointed out that according to Article 27 (2) of the RIASDARB, "Conclusion - summary of the results obtained" should be used instead of "Conclusion". The rest of the content included in this part of the thesis can be separated to improve the readability of the material.

## CONCLUSION

The dissertation contains scientific and practical results, which represent an original contribution to science and meet all the requirements of the ASDARB, the RIASDARB, the relevant Regulations of the Plovdiv University "Paisii Hilendarski" and the additional faculty requirements of the FMI on the RASD of the University.

The dissertation shows that the **Eng. Maria Todorova Grancharova-Hristova** possesses in-depth theoretical knowledge and professional skills in the professional field 4.6

"Informatics and Computer Science" demonstrating qualities and skills for independent scientific research.

**Due to the above, I confidently give my positive evaluation for the presented dissertation, abstract and achieved results, and I propose to the honourable scientific jury to award the educational and scientific degree "Doctor" to Eng. Maria Todorova Grancharova-Hristova in the area of higher education 4. Natural Sciences, Mathematics and Informatics, professional field 4.6 "Informatics and Computer Science", doctoral programme "Informatics".**

16.01.2024 г.

Signed: .....

Assoc. Prof. Irina Radeva, PhD